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Information Technology Outlines

(Professional English Basics)

Підручник з англійської мови

Видання друге, перероблене і доповнене

Київ
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Information Technology Outlines

(Professional English Basics)

Підручник покликаний розвивати професійно орієнтовану англомовну комунікативну компетентність через запропонований у ньому студентоцентрований підхід до навчання іноземної мови, який становить основу методики індивідуалізації викладання іноземних мов. Автори пропонують зручну структуру посібника, у якому кожен урок побудовано з урахуванням індивідуальних особливостей студентів. Підручник забезпечує аудиторну та самостійну роботу студентів. Для студентів галузі знань «Інформаційні технології», викладачів іноземної мови у вищих технічних навчальних закладах, та всіх, хто цікавиться проблемами викладання професійно орієнтованої англійської мови. Видання друге, перероблене і доповнене.

TABLE OF CONTENTS

CONTENTS

Unit	Title	Reading	Language Function	Writing
Module 1. Computer Systems				
1	Computer Hardware and Software	Computer and its Components	Giving Instructions	Manual / User Guide
2	Programming	Computer Programming	Function of an Item	Test Case
3	Expert Systems	Simulating Human Thought	Passive Voice	CV
Module 2. Networking Systems				
4	Computer Networks	Connecting the Planet	Reported Speech	Letter of Application
5	The Internet	The Internet and The Web	Questions	Memo
Module 3. Economical System				
6	Business and Enterprise	Business and its Types	Expressing Activities	Business Letter
7	Banking	Making Profit from Money	Giving Reasons	E-mail
8	Market and Competition	Monopolies, Oligopolies and Perfect Competition	Modal Verbs	Report
Module 4. Mathematical Systems				
9	Arithmetic and Number Theory	Queen of Math	Expressing calculations	Mathematical Problems: Proof/Solution
10	Discrete Mathematics	Discrete Mathematics	Conditionals	Abstract

PREFACE

Preface for students

The present book is an online edition of the textbook published in 2015 'Analytical Outlines', and it aims to help you become a confident English user with well-developed communicative and professional competences. As the title suggests, this book is created for students majoring in information technology, system analysis and associated areas. You will not only improve your English competences, but also learn a lot of useful for your future profession things.

Compared to the previous one, this edition offers:

– Comfortable to use split layout with Student's Book and Workbook in one.

– English-Ukrainian dictionary, which will help to find correct Ukrainian equivalents.

– Selection of vocabulary and grammar multiple choice tests at the end of every Module, and a final test at the end of the book.

– Revised and updated content of the Modules.

What makes this book special is that it adopts and takes into account the fact that every student is a unique individual with his or her own interests, style of learning, type of thinking and level of English. It makes it possible to use all these differences as a benefit for creating motivation, stimulating creative and searching activities and encouraging individual progress inside a multi-level group of students.

The materials are designed for you to practise in class and prepare tasks at home with maximal efficacy according to your current level of English. Briefly, each Unit is divided into three parts:

• Whole-Class Activity;
• Differentiated Activity;
• Optional Activity.

Whole-Class Activity section contains the core information which is essential to learn for everyone in the class. Here you will usually find a basic text, several vocabulary exercises and language function exercises.

Differentiated Activity section is developed according to different levels of English. Most exercises of this section are multilevel and usually consist of three parts in ascending order of difficulty. While choosing the part which you want to accomplish, remember that the best way to study is to do exercises which slightly exceed your current abilities. This section also contains a lot of Pair Work, Group Work and Role Play Activities. These exercises are developed to boost your communicative skills and also to create cooperative and supportive attitude in the class.

Optional Activity section proposes several additional activities for students who want either to exceed the lesson`s borders and complete another intricate task or revise simplified version of the Whole-Class Activity material.

The current split edition is accompanied by **Workbook** which contains tasks to do in preparation for the class. It may comprise several multilevel tasks, Project or Internet Search Activities. Having all done well at home will save classroom time for doing interactive tasks and will certainly influence your progress.

Using this book will not by itself make you a fluent English speaker; for that you need to care about your work at every level: at home, in class and outside the course. The best progress line will be if you do 1st or 2nd Parts of multilevel tasks at the beginning of study, and end up the course doing more complicated 3rd Part or advanced Optional Activity.

For your convenience the book is accompanied by the English-Ukrainian Glossary that includes all the words which make up active vocabulary.

Learning English requires time and effort. But if you are determined to achieve the goal and are not afraid of overcoming difficulties, your work will certainly be fruitful. We wish you successful learning experience!

The authors

Preface for teachers

The present book is a basic learning resource designed for mixed-ability groups of students majoring in IT, System Analysis and associated areas. It applies the principles of **professional-oriented** and **individualized learning** and is developed to help students study according to their individual needs, interests and styles of learning. Thus, the book is special in two respects: its content and procedure of learning.

The content of the book is designed to suit the needs of professional development and covers topics related to the spheres of IT and system analysis. The book consists of 4 Modules:

Module 1 "Computer Systems" deals with the basics of computer hardware and software, programming and expert systems.

Module 2 "Networking Systems" introduces the issues of computer networks, the Internet and World Wide Web.

Module 3 "Economical System" covers such topics as Business and Enterprise, Banking, Market and Competition.

Module 4 "Mathematical Systems" contains information on Arithmetic and Number Theory as well as Discrete Mathematics.

The book applies a non-traditional procedure of learning, where there is a place for whole-class, differentiated and optional activity during the lesson (Unit). The workbook section also contains tasks developed as home assignment for individual learning.

➢ **Whole-Class Activities**

This section opens the Unit and contains the core material which builds up the basis for all other tasks. This section usually consists of a pre-assessment quiz with range of interests included, a core text, vocabulary tasks and language function tasks. It is recommended that students discuss the topic using pre-assessment questions (Think-Pair-Share mode) before reading and then proceed to read the text. After doing so, several vocabulary and language function exercises should be done.

➢ **Differentiated Activities**

This section of the book strives to make benefit of individual differences of students by proposing them variety of tasks designed to suit individual needs. This section is challenging for teacher because it needs a lot of effort and management skills to give assistance and control the activity of every student. The section usually consists of several multi-level tasks, group and pair activities.

Multi-level tasks are divided into three parts which appear in order of increasing difficulty. The teacher may assign students to do one part, let them choose which part they want to accomplish or give task to do all the parts. It will be most effective if a student completes the task which slightly increases his or her level of competence. It is also advisable that students proceed to do tasks of higher level of difficulty in the course of learning.

Pair activities and *group activities* can also be organized in different ways so that students cooperate with each other and achieve mutual benefit.

Homogeneous grouping is the one where students are set together on the basis of approximately similar level of communicative competence. In this case teacher has the advantage of focusing instruction at the level of all students in the group and adjusting the pace and the amount of exercises done by every group.

Heterogeneous grouping, that is gathering students of varying levels of communicative competence, is an effective strategy to promote learning development of students. Low-level students benefit from being at positive learning environment, where they strive to reach higher level and also from the assistance of more able peers. High-level students are provided with opportunities to give explanations to others revising the material they learned before.

➤ **Optional Activity**

This part is designed to meet the needs of students striving to reach higher competency in English and for those who need additional assistance. The tasks from this part may be used as extra exercises or as a replacement of some activities from the previous sections. Optional Activity contains two tasks: first one represents the simplified version of the basic text with practical exercises which can be used as individual tasks for low-level students. The second task includes original text borrowed from different resources and questions to the text designed for high-level students.

➤ **Workbook Activity**

Workbook Activity is developed as home assignments for students to prepare at home. Workbook section also has multilevel structure so that students

can choose whatever level of difficulty they prefer. The section also contains Project work and Internet search tasks which should be carefully prepared at home.

English-Ukrainian Glossary that include all the words introduced to the book as active vocabulary is given at the end of each Unit. The book is also accompanied by audio and video exercises available on the CD.

We hope that the following strategies (developed and described by C. A. Tomlinson [17, 18]) will help to use the book:

Flexible grouping – purposeful reordering of students into working groups to ensure that all students work with a wide variety of group mates and in a wide range of contexts during a relatively short span of classroom time. Flexible grouping enables students to work with peers of both similar and dissimilar readiness levels, interests, and learning preferences.

Jigsaw – is a cooperative strategy aimed at involving large number of students into work on a topic. Students first meet in small groups, called *home-base groups*. Here, they review the task they must complete and clarify goals for individuals and the group. They then divide into specialty groups, or *work groups*. Each specialty group is responsible for one facet of the overall task. Every member of the specialty group works to develop a full understanding of the assigned subtopic or subtask. After an appropriate time, students reassemble in their home-base groups. Each member of the group shares the information about his or her specialty. All group members are responsible for asking questions and learning about all facets of the topic.

Peer critiques – is a means of helping students provide useful feedback on peer work in progress. Typically, partners read one another's work and then provide both positive and constructive feedback by following a critique guide developed by the teacher (often with student input). Goals of peer critiques include helping students succeed with work, helping students work at increasingly high levels of quality, developing collegial relationships among peers, and helping students develop their ability to evaluate the quality of work.

Scaffolding – refers to any support system that enables students to succeed with tasks they find genuinely challenging. Goals of scaffolding include helping students be clear about the task's purpose and directions and helping students stay focused, meet the expectations for quality of work, find and use appropriate sources of information, and work effectively and efficiently. The many types of scaffolding include study guides, step-by-step directions, and comprehension strategies.

Think-Pair-Share (T-P-S) – instructional strategy, used to engage all learners in thinking and talking about a question or issue important to a current area of study. Typically the teacher begins a T-P-S by posing an important thought question. Students are asked to write their ideas or think about the question, working silently until the teacher calls time (usually two to three minutes). This is the thinking phase of the process. In the second phase, pairing, students turn to a peer and exchange their thoughts about the question. In the final phase, sharing, the teacher states the question for the class as a whole and leads the class in a discussion of the question. The Think-Pair-Share strategy increases the likelihood that all students will engage with the question, will have something to contribute to the final discussion, and will be more invested in the outcome of the discussion than they would have been if the question had simply been posed once to the entire class and answered by the first student to raise a hand.

Tiering – a process of adjusting the degree of difficulty of a question, task, or product to match a student's current readiness level. To tier an assignment, a teacher 1) determines what students should know, understand, and be able to do as a result of the task; 2) considers the readiness range of students relative to these goals; 3) develops or selects an activity that is interesting, requires high-level thought, and causes students to work with the specified knowledge, undemanding, and skill; 4) determines the complexity level of the starting-point task compared with the range of student readiness; 5) assigns students to the various versions of the task at levels likely to provide attainable challenge.

We hope that this book will help facilitate and improve the efficacy of instruction to the multi-level group and wish you success and enthusiasm in the work.

The authors

MODULE 1. COMPUTER SYSTEMS

At the end of this module Students will know:

➢ notions of computer hardware and software, programming and expert systems;
➢ basic parts of a computer;
➢ types of programming languages;
➢ principles of expert systems work.

At the end of this module Students will understand:

➢ the way computer helps to solve complicated problems;
➢ how programming languages have changed overtime;
➢ how expert systems can be applied in our lives.

At the end of this module Students will be able to:

➢ explain the structure of a typical computer;
➢ define the functions of computer parts;
➢ give instructions connected with computer operation;
➢ write simple user guides, test cases and CVs.

Unit 1. Computer Hardware and Software

Lesson 1

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about computer hardware and software. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. Who invented the first computer and when?
2. How have computers changed over time?
3. What was the most important breakthrough in computer development?

Practical Concern

1. What can we use a computer for?
2. What are the main parts of a computer?
3. What software is the most useful?

Analytical Concern

1. Why was the first computer invented?
2. What would have happened if a computer hadn't been invented?
3. Who benefits most from the existence of a computer?

Creative Concern

1. Why is the "mouse" called that way?
2. How can a computer help to create original things?
3. How can we use a keyboard in an unusual way?

Task 2. Reading

Read the text about computer hardware and software. Explain the meaning of the key words in bold. You have 20 minutes for this activity.

Computer and Its Components

It was probably the worst prediction in history. Back in the 1940s, Thomas Watson, boss of the giant IBM Corporation, forecast that the world would need no more than "about five computers". Six decades later and the global population of

computers has now risen to something like one billion machines! To be fair to Watson, computers have changed enormously in that time. In the 1940s, they were giant scientific and military devices and cost millions of dollars apiece; today, most computers can be found in everything from microwave ovens to cellphones.

A computer is an electronic machine that processes information – in other words, an information processor: it takes in raw information (or data), **stores** it until it's ready to work on it, processes it and then gives out the results. Different parts of a computer are designed to fulfil these functions.

A keyboard and a mouse are examples of **input units** – ways of getting information into your computer. A microphone and voice recognition software may also be used as another form of input. All the documents and files are stored on a **hard-drive** – a huge storage (memory) device. Smaller, computer-based devices like digital cameras and cellphones use other kinds of storage such as **flash memory cards**. Computer's processor (sometimes known as **the central processing unit** or CPU) is a microchip which works amazingly hard and gets incredibly hot in the process. That's why a computer has a fan to stop it from overheating. Finally, computer output devices may include **LCD screen** capable of displaying high-**resolution** graphics, stereo loudspeakers and an inkjet printer to make a more permanent form of output.
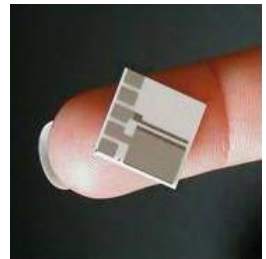
All the physical equipment used in a computer system together with **peripherals** you plug into it make up **computer hardware**. By contrast, computer programs are called software because ability **to run** different software is what makes a computer flexible.

The first computers were gigantic calculating machines made to deal with numbers and solve difficult mathematical problems. Today, computers work on a much wider variety of problems – but they are all still, essentially, **calculations**. Suppose you're looking at a digital photo in a **photo-editing program** and you decide you want a mirror image of it (in other words, flip it from left to right). The photo is made up of millions of **pixels** arranged in a grid pattern. The computer stores each pixel as a number, so to flip a digital photo it simply reverses the sequence of numbers so they run from right to left instead of left to right.

What makes a computer different from a calculator is that it can work all by itself. You just give it your **instructions** and it performs long and complex series of operations all by itself. Back in the 1970s and 1980s, if you wanted a home computer to do something, you had to write your own little program to do it. For example, before you could write a letter on a computer, you had to write a program that would read the letters you **typed** on the keyboard, store them in the memory,

and display them on the screen. Writing the program usually took more time than doing what you had originally wanted to do (writing the letter). Pretty soon, people started selling programs like word processors to save you the need to write programs yourself.

Today, most computer users buy, **download**, or share programs like Microsoft Word and Excel. Hardly anyone writes programs any more. Most people see their computers as tools that help them do jobs, rather than complex electronic machines they have to pre-program – and that's just as well, because most of us have better things to do than computer programming.[1]

Task 3. Vocabulary Practice

Match the words (1-7) with their definitions (a-g). You have 5 minutes for this task.

1. Computer	a) a peripheral device that accepts data and feeds it into a computer
2. Input device	b) the physical equipment used in a computer system
3. Output device	c) the programs that can be used with a particular computer system
4. CPU	d) a device that processes data according to a set of instructions
5. Hardware	e) devices or units that operate separately from the CPU but are connected to it
6. Software	f) any piece of computer hardware equipment used to communicate the results of data processing
7. Peripherals	g) the part of a computer that performs logical and arithmetical operations on the data

Task 4. Vocabulary Practice

Read the text and fill in the gaps with the words from the list. You should use the scheme below. You have 10 minutes to complete this task.

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[1] The text is borrowed and modified from http://www.explainthatstuff.com/howcomputerswork.html as of 18th December 2012.

manufactureroutputhardware processing BIOS chips computer programs operating system
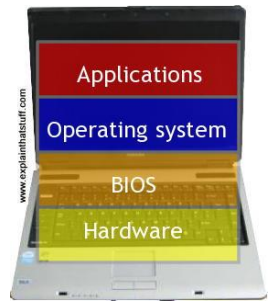
An (1) .... is the core software in a computer that controls the basic operations of input, (2)............., storage, and (3) .... You can think of an operating system as the "foundations" of the software in a computer: other (4) .... (called applications) are built on top of it. The operating system relies on an even more fundamental piece of programming called the (5) ....(Basic Input Output System), which is the link between the operating system software and the (6) .... Unlike the operating system, which is the same from one (7) .... to another, the BIOS vary from machine to machine according to the precise hardware configuration and is usually written by the hardware (8) ....The BIOS is not, strictly speaking, software: it's a program semi-permanently stored into one of the computer's main (9) ....

Task 5. Language in Use

In your profession and everyday life you often feel the need to give instructions. Especially this skill is useful when writing manuals or user guides. Study the box explaining the ways of giving instructions. After that, match purposes of actions with the instructions using the information from the box. You have 10 minutes for this task.

Giving Instructions

1. We make simple instructions using the **<u>infinitive:</u>**
    e.g. <u>Open</u> the file.
2. We express the purpose of an action using **"To", "In order to":**
    e.g. <u>To</u> open the file, double-click the icon.
     Double click the icon <u>in order to</u> open the file.
3. We can explain how to perform an action using **"by + V+ing":**
    e.g. Open the file <u>by double-clicking</u> the icon.
4.When we have several instructions, we can put them into order using
    "**First", "Then", "Finally":**
    e.g. <u>First,</u> open the file. <u>Then,</u> copy the text. <u>Finally</u>, insert the text
    into the address line.
5. We can show that one action follows another using **"Having done":**
    e.g. <u>Having opened</u> the file, copy the text.
6. We can express warnings by using **"Do not + Infinitive":**
    e.g. Do not open the file until the installation is over.

1	Open a file	a	double-click on the icon
2	Select a file	b	press TAB
3	Drag an object	c	click the Start button, then click Power
4	Type all letters as uppercase	d	press F1
5	Move the cursor several spaces forward	e	point to the object on the screen, press and hold the primary button, move the object to a new location
6	Display Help for a program or Windows	f	click its Maximize button or double-click the window's title bar
7	Make a window fill the entire screen	g	left-click the icon
8	Turn off the computer	h	press CAPS LOCK

Differentiated Activity

Task 6. Group activity

You are going to be divided into several groups to work out topical content of the text from Task 2. After that you will have to report your findings to the class. You have 10 minutes for this task.

Group 1. Your task is to track historical information in the text and fill in the gaps.

Back in 1940 … predicted that…
In 1940[ies] computers were …
The main task of the first computers was …
Back in 1970s and 1980s you had to …
Today, computers are …

Group 2. Your task is to complete a chart and give commentaries on it using the following expressions:
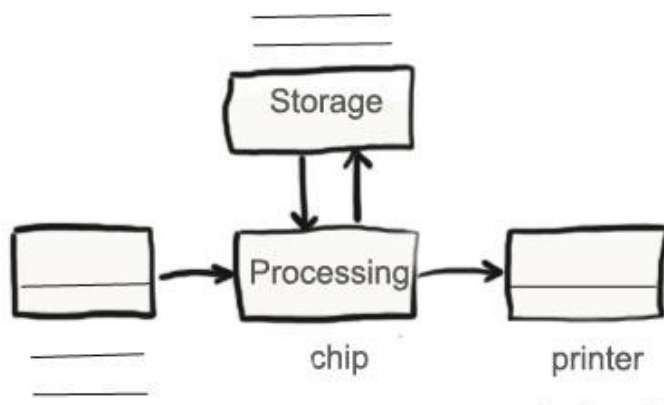
A computer works in such a way:
at first …
Then…
Finally…
An example of storage devices are…
Another examples are..

Group 3. Inside your group, discuss the following questions:

Why did Thomas Watson think that the world would need only five computers?
How have computers changed over time?
What is the difference between software and hardware?

Task 7. Fill in the gaps

An operating system is composed of (1) …… that is necessary to run your computer. Operating system software (2) ...... your computer`s hardware components and all other software being used on your computer.

17

Traditional operating systems were (3) ......, and usually consisted of (4) ...... and computer responses. Most modern operating systems have a (5) ...... graphical user interface, or GUI.

When you (6) ...... a piece of application software on your computer, it usually uses the element of the GUI. Elements of a GUI include such things as: windows, (7) ...... , buttons, scroll bars etc. GUIs are easier to use, faster, and accommodate better organization of your (8) ...... and files than traditional operating systems.

1	software	instructions	tools
2	commands	controls	instruct
3	intuitive	voice-controlled	text-based
4	commands	letters	tasks
5	user-welcome	user-friendly	user-safety
6	install	choose	search
7	loudspeaker	mouse	menus
8	applications	space	time

Part 2. Decide whether the following statements are true (T) or false (F). Justify your answer.

1. Operating system software controls peripheral hardware.   ☐
2. Traditional operating systems, such as DOS, had graphical userinterface. ☐
3. When you install a piece of application software on your computer, it   ☐
usually uses the element of the GUI.   ☐
4. Windows, menus, buttons and screen are the elements of a GUI.   ☐
5. GUI's are easier to use.   ☐

Task 8. Pair work

In pairs, give each other instructions on how to perform the following actions using the help box from Task 5:

Start your computer	Uninstall a program
Turn off your computer	View the list of all programs
Drag a file	Find a file
Copy a file	Create a System Image
Delete a folder	Restore files

You have 10 minutes for this task**.**

Task 9. Role-play. Pair Work

      Student 1. Imagine that you have one of the following problems with your computer:

- *PC is running slowly*
- *Internet is slow or not loading*

      You have decided to telephone the support service and ask a specialist for help. Describe your problem, give details and answer the questions you may be asked.

      Student 2. Imagine that you work in a technical support call centre. You have been asked to help with a particular PC problem. Ask questions about the problem and give instructions on how to solve it. The possible solutions are:

Check Task Manager	*Disable and re-enable connection*
Uninstall unnecessary applications	*Change wireless channel*
Scan for Viruses	*Reset the settings of your browser*
Clean up a PC	*Install another browser*

      After you have done the task, switch the roles and act out a dialogue about the second problem. You have time until the end of the class.

Optional Activity

Task 10. Facilitated Task

a) Read an extract from the text. Note, that Present Simple tense is often used in descriptions of objects. Analyse the underlined grammatical forms and deduce the rules of Present Simple formation in singular and plural.

b) Make up your own sentences in Present Simple tense using the words / phrases in bold.

A **computer** is an electronic machine that processes information. Taking in information is called **input**, storing information is known as memory (or storage), chewing information is also known as **processing**, and giving out results is called **output**.

Keyboard and mouse are input **units** – ways of getting information into your computer that it can process. Computer stores all documents and files on a **hard-drive**: a huge magnetic memory. But smaller **devices** like digital cameras and cellphones use other kinds of storage such as **flash memory cards**. The main part of a computer is a processor. It is also known as **the central processing unit** or CPU. Computer usually has an **LCD screen** capable of displaying high-**resolution** (very detailed) graphics. It may also have other peripheral devices such as stereo **loudspeakers** or an **inkjet printer.**

What makes a computer different from a calculator is that it can work all by itself. You just give it **instructions** (called a program) and it performs a long and complex series of operations all by itself. Today, most computer users buy, **download**, or share programs like Microsoft Word and Excel.

Task 11. Complex Task

Read the article about 3-D printing technology from 'The Economist'. Answer the following questions:
1. What does the author mean by saying that 3-D printing technology 'does the opposite' in the first paragraph?
2. How does a 3-D printer work?
3. What are the advantages and disadvantages of this technology?
4. What historical parallels does the author draw in the article?
5. How do you see the future of 3-D printing? Who will benefit and loose from the new technology?

Print Me a Stradivarius:

How a New Manufacturing Technology Will Change The World

The industrial revolution of the late 18th century made possible the mass production of goods, thereby creating economies of scale which changed the economy – and society – in ways that nobody could have imagined at the time. Now a new manufacturing technology has emerged which does the opposite. Three-dimensional printing makes it very cheap to create single items, which may have as profound an impact on the world as the coming of the factory did.

It works like this. First you call up a blueprint on your computer screen and tinker with its shape and colour where necessary. Then you press print. A machine nearby whirrs into life and builds up the object gradually, either by depositing material from a nozzle, or by selectively solidifying a thin layer of plastic or metal dust using tiny drops of glue or a tightly focused beam.

Eventually the object in question – a spare part for your car, a lampshade, a violin—pops out. The beauty of the technology is that it does not need to happen in a factory. Small items can be made by a machine like a desktop printer, in the corner of an office, a shop or even a house; big items – bicycle frames, panels for cars, aircraft parts – need a larger machine, and a bit more space.

At the moment the process is possible only with certain materials (plastics, resins and metals) and with a precision of around a tenth of a millimetre. But 3D printing is spreading fast as the technology improves and costs fall. A basic 3D printer, also known as a fabricator or "fabber", now costs less than a laser printer did in 1985.

This technological change will reset the economics of manufacturing. Some believe there will be no need for factories when every village has a fabricator that can produce items when needed. Others maintain that even if 3D printing does bring manufacturing back to developed countries, it may not create many jobs, since it is less labour-intensive than standard manufacturing.

The technology will have implications not just for the distribution of capital and jobs, but also for intellectual-property (IP) rules. When objects can be described in a digital file, they become much easier to copy and distribute – and, of course, to pirate. There are sure to be calls for restrictions on the use of 3D printers, and lawsuits about how existing IP laws should be applied. It is unclear whether 3D printing requires existing rules to be tightened (which could hamper innovation) or loosened (which could encourage piracy).

Just as nobody could have predicted the impact of the steam engine in 1750 – or the printing press in 1450, or the transistor in 1950 – it is impossible to foresee the long-term impact of 3D printing. But the technology is coming, and it is likely to disrupt every field it touches.[2]

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[2] The text is borrowed and modified from http://www.economist.com/node/18114327 as of 9th January 2013.

Lesson 2

Whole-Class Activity

Task 12. Do or check Tasks 1-2 from your Workbook (10 minutes).

Task 13. Work in pairs. Be ready to report the results of your Internet search to the class. Ask each other questions about the functions of computer systems (10 minutes).

Task 14. Discuss the following questions for 5 minutes. Turn to the help box if necessary:

1. What do you think a manual is?
2. What is the difference between a user guide and a manual?
3. What is the aim of a manual?
4. In what spheres are manuals often used?
5. What sections does a manual usually include?
6. How many languages are manuals written in?
7. How many pages should a manual contain?
8. Does a manual typically include illustrations or screenshots?

A **user guide** or **user's guide**, also commonly known as a **manual**, is a technical communication document intended to give assistance to people through a set of instructions.

User guides are most commonly associated with electronic goods, computer hardware and software.

The **sections** of a user guide often include:

A title page;
A preface, containing general description of a product;
A contents page;
A guide on how to use at least the main functions of the system;
A troubleshooting section detailing possible errors or problems that may occur, along with how to fix them;
Warnings;
A FAQ (Frequently Asked Questions)
Where to find further help, and contact details;
A glossary and, for larger documents, an index

Task 15. Look through the following elements (A-I) and decide which sections of a manual they belong to. Consult the previous exercise if necessary. You have 5 minutes for this task.

A.

Contents

Sony Ericsson W300c

This is the Internet version of the user's guide. © Print only for private use.   1

B.

C. • Do not use this product near water.
     • Do not place this product on an unstable cart, stand or table.

D.   For technical assistance, contact your local dealer or distributor. You may also access our website for information on how and where to contact the service centres available in your area.

E.   If the computer won't respond or the pointer won't move
     • First, make sure the mouse and keyboard are connected.
     • Unplug and then plug in the connectors and make sure they are secure.

F.   To use a USB device with your computer, simply connect the device to the computer. Your computer automatically accesses the necessary software whenever you connect a new device.

G.   hard disks 26
     headphone outlet 32
     headphones, speakers 15

H.   Welcome to the new ProQuest search experience. ProQuest is all-new, powerful, comprehensive, and easy-to-navigate search environment. It's a better way to search, find, use, and share information.

I. How do I create a new page?
     There are several ways to create a new page:
     • Create a link to the page on another page, then click on the red link which appears.

Task 16. Manual: Writing Techniques

     Read the text about writing a manual. Decide which steps of writing you find the most or the least important and why (15 minutes).

Writing a Manual: Steps to follow

In your day-to-day work, you might find that there are times when you need to provide a client with documentation that walks them through a process or instructs them how to do something they may be unfamiliar with. Writing a manual on an important function at work can demonstrate your abilities to your superiors. It demonstrates your ability to complete a project on your own. A **manual**, also commonly known as a **user guide** or **user's guide**, is a technical communication document intended to give assistance to people using a particular system.

User manuals have a bad reputation. In a recent USA Today poll that asked readers "Which technological things have the ability to confuse you?" user manuals came out top! Increasingly companies are rethinking the way they approach user manuals. Here are some steps to help you create a comprehensive instruction manual.

1. **Decide on your subject**. Be specific in scope and range.
2. **Decide what audience you are writing for**.
   - Are you writing a manual for beginners or experts (or somewhere in between)?
3. **Define exactly what you are going to talk about in the manual**.
   - Example: You are writing a manual "How to Install an Operating System". One section might be about Windows 7. Another section might be about Mac OS. Still another section might be about Linux.
4. **Decide upon a logical order to present your manual**. This is not only about a logical order of actions. Some subject may need to be presented first. For example, tasks that will be included in all parts of the manual should probably be discussed first.
5. **If the manual is going to use technical terminology prepare a glossary**. If it is unlikely the reader will already know the terms, place the glossary immediately after the table of contents.
   - Definitions of terms in the glossary need to be as exact as possible. If the term is an acronym, like "GUI", then fully explain that it means "Graphical User Interface" in the definition.
6. **Decide on an organization for each section you are going to write**.
   - Example: You are writing a manual about a computer. You have a section called "Troubleshooting". You might write part of it about disk space issues. You might write another part about an excessive memory usage.
7. **Organize each section and subsection in a logical order, narrowing the range of the topic**. Use your organization as a guide, but alter it if it doesn't work.
   - Write descriptions of different tasks.
   - Write examples that the reader can follow to gain instruction.
   - Prepare appropriate illustrations.
8. **Proofread, Proofread and proofread again**.
   Proofreading should be ongoing. Make notes of errors or omissions. Correct them. Make notes of passages others find confusing. Rewrite the

passage to make it easier to read. Have a variety of people read your manual to insure the best possible result.[3]

Task 17. You have found out that someone has been using your computer manual and several pages have dropped and mixed. Read the following extracts from the manual and put them in the correct order (5 minutes).

Setting up your computer

a	Opening the package
	Open the package carefully and ensure that all items are present and in good condition. If any of the items are missing or appear damaged, contact your dealer immediately.

b	Starting your computer
	After connecting all the peripheral equipment, start your computer according to the steps below: 1. Turn on all peripheral equipment, such as the monitor, printer, speakers, etc. 2. Turn on the system. Once the start up process is complete, you can begin to use your computer.

c	Connecting peripherals
	After everything is connected, plug the power cord into the system and insert the other end into a power outlet. Note: Don't connect the system power cord before connecting all peripherals to the system.

d	Selecting a location
	Selecting the optimum location for your computer: • Do not place the system too close to other electrical equipment. • Do not place the system in areas where the power cord or other cords may be stepped on. • Avoid placing the system in any location that is excessively dusty or damp.

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[3] The text is borrowed and modified from http://www.wikihow.com/Write-a-Manual-from-Scratch as of 16th March 2013.

Differentiated Activity

Task 18. Tiered task

You are going to watch a video about the ways of creating a table in Word. You have 10 minutes to do and check the tasks after watching it. Use the following link to watch the video:

http://www.youtube.com/watch?v=JwbI4Zzd4r8

Part 1. Fill in the missing information.

You can (1) .... a spreadsheet in a Word document in a couple of different ways. You can go to (2) ...., 'Insert Table', select the number of (3) .... and select the number of rows you wish. Click (4) .... and it will automatically create a table or a spreadsheet inside the Word (5) .... for you.

The other way to create an Excel (6) .... in a Word document is by opening up Excel, starting a new (7) .... and typing your data. Then you can select the (8) .... of your spreadsheet, right-click, select '(9) .... , open up Word, create a new blank document and then right-click and (10).......... And your spreadsheet will appear in your Word document.

Part 2. Match the actions with the way of inserting a table in a Word document. Put the actions in the correct order. Give your answer using such words as "to", "so that", "in order to" etc.

1	To create a table in Word	a	Go to 'Table', 'Insert table'
		b	Click 'Ok'
		c	Open up Word
		d	Select the cells
		e	Open up Excel
2	To insert a spreadsheet from Excel	f	Right-click and paste
		g	Go to 'File', 'New blank document'
		h	Start a new Workbook and type data
		i	Select the number of columns and rows
		j	Right-click and copy

Part 3. Explain the difference between the mentioned two ways of creating a table. What is the difference between a table and a spreadsheet?

Task 19. Tiered Task

Style of writing is very important when creating a user manual. Read the tips in the box on how to write appropriate instructions. Then, compare two extracts from a printer user manual and do the following tasks within 10 minutes:

Part 1. Decide which extract is better and why. Point any mistakes that you can find in the extract.

e.g. I think, that Extract … is better, because it is… It has many mistakes, for example, in step 1 the paragraph is too long and contains unnecessary infor-mation…

<div style="border:1px solid">

How to give instructions

Many user manuals have instructions that are incomplete or incorrect. Here are some guidelines to help make instructions easy on the user.

Provide step-by-step sequences in the correct order.

Follow the timing and sequencing of the actual operations.

Provide visual stepping stones (e.g. Step 1, Step 2 etc.)

Avoid lengthy paragraphs.

Use everyday words and terms: avoid jargon.

Explain what a function or feature is for (in basic practical terms) as well as "How to" instructions.

Do not assume the user has prior experience or product knowledge.

Write in the present tense and the active voice.

</div>

Part 2. Find mistakes in steps 1-4 and propose your own variant of writing instructions.

e.g. In step 1 the paragraph is too long and contains unnecessary information… It would be better to…

Part 3. Find mistakes in steps 5-8 and propose your variant on how to correct them.

Extract 1

To install the printer driver from the Software and Documentation CD-ROM:

1. Insert the CD-ROM into the computer's CD-ROM drive. If the installer does not launch, do the following:
    a. Click Start, and then click Run.
    b. In the Run window, type: <CD drive>:\INSTALL.EXE.
2. Select your desired language from the list.
3. Select Install Printer Driver.
4. Select the installation method you want to use, and then follow the onscreen instructions.

Extract 2

To print a borderless document:

1. Load the appropriate paper. This could be matte paper, glossy paper or even gloss laminated paper which can be used in cards production.
2. The file that you want to print should be opened.
3. So, you have clicked File, and now all you have to do is just click Print.
4. After having selected the previous options, click Properties, and then click Setup to get into Feature tab.
5. Select the media size from Size drop-down list after the Feature tab has been selected.
6. Borderless check box should be selected.
7. If you are printing photos, select Best from the Print Quality list. Alternatively, select Maximum dpi, which provides up to 4800 x 1200 optimized dpi for optimum print quality. This setting might temporarily use a large amount of hard disc space (400 MB or more) and will print more slowly. To avoid this, you may change other print settings (for more information, see Settings).
8. Initialize document printing procedure.

Task 20. Practical Concern

Work in groups. Look through the manuals / user guides you have brought to the lesson as your home assignment. Do they have the same structure and features as was described in the previous exercises? Analyse your manuals in terms of:

1. Aim of the manual;
2. Contents;
3. Layout;
4. Visual aids;
5. Peculiarities.

You have 5 minutes for this task.

Task 21. Project work

Work in teams. Imagine that your company is going to release a line of peripheral devices. You have been given the task to prepare a manual for one of the following items:

Team 1. Prepare a user manual for an optical mouse.

Team 2. Prepare a user manual for a smart watch.

Team 3. Prepare a user manual for a USB web camera.

Divide responsibilities inside your team so that one person prepares one part of the manual. Remember that your manual should have the following parts:

➢ *Preface, where you present the device, give its name and purpose*
➢ *Guide on how to use the device*
➢ *Warnings about where and how the device should not be used*
➢ *Troubleshooting section, where you give possible problems with device and explain how to fix them*
➢ *FAQ, where you give answers to the questions which may occur while using the device*
➢ *Section, where you give contact details.*

After completing the manual, discuss it in a whole-group meeting, and choose the best one. You have 20 minutes to perform and check the task.

Optional Activity

Task 22. Facilitated Task

Read the following extracts from a manual. Choose the correct form out of three written in bold. After doing this, write your own steps to complete the instructions.

A. 1. **Click/ Clicking / Clicks** Start button.
   2. **Selecting/ Select/ Selected** the Control panel.
   3. **Click/ Clicking / Clicked** Date and Time settings.
   4. ....
   5. ....
B. 1. **Shut / Shuts/ Shutting** down the computer completely.
   2. **Unplugged/ Unplug/ Unplugs** the power adapter from the main unit.
   3. **Opens/ Opening/ Open** the case of a computer.
   4...
   5...

Task 23. Complex Task

Analyse the following extract from a manual. What is the purpose of the manual? What software is described? How can Java Control Panel be accessed? Write your own manual for any action in GUI environment.

1. a. **For Windows 7, Vista**
   - Click on the **Start** button and then click on the **Control Panel** option.
   - In the **Control Panel Search** enter **Java Control Panel**.
   - Click on the Java icon to open the Java Control Panel.
   b. **For Mac OS X 10.7.3 and above**
   - Click on **Apple** icon on upper left of screen.
   - Go to **System Preferences**
   - Click on the Java icon to access the Java Control Panel.
2. In the Java Control Panel, click **Settings** under the Temporary Internet Files section. The **Temporary Files Settings** dialog box appears.
3. Click **Delete Files** on the Temporary Files Settings dialog. The **Delete Files and Applications** dialog box appears.
4. Click **OK** on the **Delete Files and Applications** dialog. This deletes all the Downloaded Applications and Applets from the cache.
5. Click **OK** on the **Temporary Files Settings** dialog. If you want to delete a specific application and applet from the cache, click on View Application and View Applet options respectively.

Unit 2. Programming

Lesson 3

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about programming. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. How did programming look like fifty years ago?
2. What was the main breakthrough in programming?
3. How often is programming used nowadays?

Analytical Concern

1. What classes of programming languages do you know?
2. What are the criteria of such classification?
3. What would have happened if programming had remained on its initial level of development?

Practical Concern

1. What programming languages do you know?
2. Do you have any experience of using programming?
3. Where do we use programming?

Creative Concern

1. Can programming be used in a creative way? Give examples.
2. In what way is programming used in such areas as music and art?
3. How can programming help create computer games?

Task 2. Reading

Read the text about computer hardware and software and answer the quiz questions. You have 20 minutes for this activity.

Computer Programming

Writing software or computer programs means describing how to do something. In its simplest form, programming is breaking a task down into small **steps**. In this respect, writing a computer program can be like composing music,

building a house or creating other things. It has been even argued that in its current state, programming is an *Art*, not engineering.

Today, most people don't need to know how a computer works. Most people can simply **turn on** a computer or a mobile phone and point at some graphical image on the display, click button, and the computer does something. Basically, computers **perform** operations on objects. A microprocessor, which is the heart of a computer, is really primitive but very fast. It manipulates groups of **binary numbers** – numeric values represented in only two symbols: 0 and 1. Microprocessor operates binary numbers, representing parts of objects, and moves them around, **adds** pairs together, **subtracts** one from another, **compares** a pair, etc. As an example, computer display consists of a bunch of objects called pixels. Every pixel has a position which consists of the row and column it is in. Its colour is specified as three numbers – called RGB (Red, Green, Blue) values.

Machine language, or machine code, is represented in 1s and 0s and is **executed** directly by a processor. The pioneers of computers wrote code in machine language, but no one does it these days.
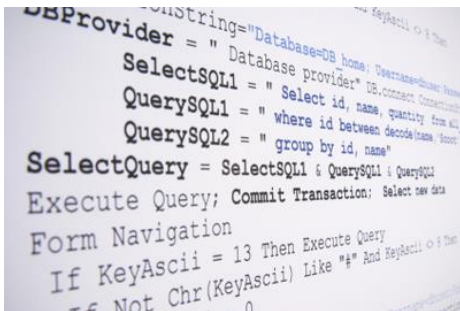
One step above machine language is **assembler language**. In assembler, the operations that the microprocessor performs are given names. Addresses in memory can also be given meaningful names. This is a big step over binary, but still very tedious to do any large software program with. It still has its place for little pieces of software that need to **interact** directly with the microprocessor.

Most software written today is written in **high-level languages**, some of them are quite old. For example, COBOL, FORTRAN, and Lisp were written in the 1950s. Instructions written in high-level languages are converted into machine code with the help of specific software called **compiler**. Thus, high-level languages abstract away the specifics of the microprocessor in your computer and may use natural language elements making the process of **developing** a program simpler and more understandable.[4]

1. What is computer programming?

   A. Convincing the computer to never freeze.
   B. Speeding up your computer.

2. The software that translates code into something meaningful which the computer can understand is called ...

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[4] The text is borrowed and modified from http://www.bfoit.org/Intro_to_Programming/Programming.html as of 12th February, 2013.

C. Setting the alarm on a computer.

D. The act of instructing computers to perform tasks.

A. Compiler.
B. Converter.
C. Transliterator.
D. Translator.

3. Basically, computers perform operations on ….

A. Things.
B. Objects.
C. Icons.
D. Stages.

4. In assembler languages, the names are given to…

A. Objects.
B. Microprocessor.
C. Operations and addresses.
D. Memory.

5. Microprocessor can understand only commands written in…

A. English language.
B. 1s and 0s.
C. Any numbers.
D. Words and symbols.

6. Which class of languages allows for the use of words and commands?

A. Machine code.
B. High-level language.
C. Assembler language.
D. Source code

Task 3. Vocabulary Practice

Match the words (1-7) with their definitions (a-g). You have 5 minutes for this task.

1. Programming	a) a set of instructions executed directly by a computer's central processing unit
2. Binary numbers	b) creating a set of instructions that computers use to perform specific operations
3. Machine code	c) a computer program that transforms source code written in a programming language into another computer language
4. Assembler language	d) a program which translates from assembly language to machine language format
5. Compiler	e) representation of numeric values using two symbols: 0 and 1
6. High-level language	f) programming language with strong abstraction from the details of the computer
7.Assembler	g) a low-level programming language in which there is a very strong correspondence between the language and the machine code instructions

Task 4. Vocabulary Practice

Read the following sets of words / phrases and find out how they relate to each other. You have 5 minutes for this task.

E.g. "Program" is a synonym for "software". "Create" is an antonym for "destroy".

Programming, primitive, high-level, divide, convert, stage, turn on, part, execute, language, add, general, whole, complicated, low-level, step, specific, code, perform, change, break down, turn off, instruction, coding, command, subtract.

Task 5. Language in Use

When you deal with computer hardware and software you often need to explain how some items work. Study the table in which the ways of explaining functions of an item are given. After doing so, match the computer parts (1-8) with their functions (a-h) and explain them using the information you have studied. You have 10 minutes for this task.

Function of an Item

The function of an item can be described in the following ways:
1. Used for + V ing
    e.g. CDs are used for saving information.
2. Present Simple
    e.g. Operating system controls the hardware.
3. The function of ..... is to ....
    e.g. The function of input devices is to get information into computer.
4. be responsible for V ing
    e.g. The CPU is responsible for interpreting codes.
5. allows you …, enables you to …
    e.g. Software allows you perform different operations.

---

1. Housing	a) interpret every code it receives from the other computer components, and make it usable to operating system
2. Motherboard	b) produce a paper copy of the information on your screen
3. CPU	c) hold all the parts that make the computer operate
4. Hard drive	d) produce sound and music when connected to the computer
5. Mouse	e) process information and perform computations
6. Speakers	f) wire all of the computer parts together
7. Printer	g) point to and select items on your screen
8. Computer	h) store the information

Differentiated Activity

Task 6. Group activity

In groups, work out the topical content of the following text. After that you will have to report your findings to the class. You have 10 minutes for this task.

Software creation

In order to create software you have to do more than just learning a programming language. A quick overview of the process includes the following stages:

1. Writing a program

This means writing the steps needed to perform the task, using the programming language you know. Set of instructions which you type to create a program is usually called source code.

2. Compiling the program

When you write a program using programming language, it's not yet in a form that the computer can use. In order to use a program, you usually have to convert it into machine code first. This conversion process is called compiling, or compilation. A program called a compiler does the compiling.

3. Running the program

After compiling the program into a form that the computer can use, next step is to make the computer perform the steps that you specified. This is called running the program, or executing it.

4. Debugging the program

The term "debugging" came about because the earliest computers were huge building-sized machines, and real-life insects sometimes flew into the machinery, so first computer engineers had to physically "debug" the computers. Nowadays the term refers purely to fixing errors and problems in source code of the program.

5. Repeating the whole process until the program is finished

This stage includes improving the program until it satisfies the demands of software engineers and customers. This stage can be quite long and demanding. Programmers commonly release a new version of their program every day for a couple of weeks after the initial release.

Group 1. Your task is to track information in the text and give definitions to the following terms:

Compilation, source code, program executing, compiler, initial release, debugging.

Group 2. Your task is to create a scheme of the process with details and examples for each stage, if possible.

Group 3. Inside your group, give detailed explanation for every stage of software creation. Decide, what stage is the most important. Are there any other stages, which were not mentioned in the text?

Task 7. 🔊 Listening

You are going to watch a video about the development of object-oriented programming. Choose whatever part you feel confident to complete or do them all. You have 10 minutes for the task. Use the following link to watch the video: http://bigthink.com/videos/why-i-created-c

Part 1. Fill in the gaps:

In the really old days, people had to write their (1)………… directly to work on the (2) ………. You could do pretty good work with that, but it was very (3) ……….. Then they figured out that you could build languages fit for humans for specific areas, and they built FORTRAN for engineers and (4) …………. and COBALT for (5) ……….

And then a group of Norwegian programmers thought about creating a language that is fit for humans for all domains, not just linear (6) ……… and business. And they built language called SIMULA. And that's where they introduced the (7) ...…... as the thing you have in the program to represent a (8) ...…... in your application world. And they went a little bit further and represented (9) ………. between classes. This became known as (10) ………. or data abstraction.

Part 2. Decide whether the following statements are true (T) or false (F). Justify your answer.

1. In the old days people wrote code using hardware. ☐
2. FORTRAN and COBALT fit for specific areas. ☐
3. SIMULA was created in the mid -16s ☐
4. Class represents a concept in an application world. ☐
5. Matrix, personnel record and dial buffer might become a class. ☐
6. SIMULA failed to represent relationships between classes. ☐
7. Vehicle is a kind of car. ☐
8. Object-oriented programming is also called data abstraction. ☐

Part 3. Retell the text giving as many details as possible. You may use the text from Part 1 or statements from Part 2 as scaffolds.

Task 8. Pair work

Work in pairs. Using the help box from Task 5, ask each other and explain the functions of the following keys:

Shift, Caps Lock, Tab, Alt, Ctrl, End, PgDn, Prt Sc

You have 10 minutes to complete this task.

Task 9. Role-play. Pair Work

Student 1. Imagine that you are running a website which sells unusual programs. You work as a call operator and your task is to explain to the clients the functions of programs and propose different software. Look at Chart A for information.

Student 2. You are interested in creative and simple software to install on your mobile device. Your friend gave you the list of recommended funny programs. Ask the operator about their functions. Turn the page and look at Note B for information.

You have time until the end of the class.

Chart A

Virtual Music Composer 4.0	Virtual Music Composer produces its own completely new musical themes.	$19,95
Face Off Max 3.4.	Face Off Max is software that enables you to create funny photos by transplanting any face to any body and share the fun with your friends.	$20,00 $10,00
SpoofKit 1.0	Spoofkit lets you send your family or friends, joke/spoof emails. You will be able to send your brother an email from the Queen or a letter from Arnold Swarchenegger. Now available for use in social networks!	$17,85

Horse Racing Predictor 1.5	With the help of advanced algorithms based on neural networks this revolutionary software will predict horse racing results with great accuracy	$19,95
Personality type test 1.0	This test determines your psychological state and personality type.	$13,25
Free Spy Message 1.0.	The SpyMessage is easy-to-use tool for protecting important information that you don't want others to see. With SpyMessage you can encrypt and hide your text message into image without changing size.	$15,50

Note B

1. *Personality type – best option!*
    (ask if it is compatible with your OS)
2. *Face off – useful in Facebook*
    (and maybe it is still at a discounted price)
3. *Spoofkit made me laugh many times*
    (I heard the latest version has some additional features)
4. *Don't ever try Horse Racing Predictor!!*
    (I actually lost money because of it)

Optional Activity

Task 10. Facilitated Task

a) Read the following extract and compare it with the text from Task 2. Note that Past Simple tense is used to describe actions or events which happened in the past. Analyse the underlined grammatical forms and answer the following questions:

- Why was Past Simple used in this extract?
- How is Past Simple formed?
- Make Past Simple forms for the verbs "to be", "to have", "to write". Why are they different from the usual Past Simple forms?

b) Make up your own sentences in Past Simple tense using the words in bold.

Some years ago, a **microprocessor**, which <u>was</u> the heart of a computer, <u>was</u> really primitive but very fast. It <u>manipulated</u> groups of **binary numbers** – numeric values represented in only two symbols: 0 and 1. Microprocessor <u>operated</u> binary numbers, representing parts of objects, and <u>moved</u> them around, <u>added</u> pairs together, <u>subtracted</u> one from another, **compared** a pair, etc. As an example, computer **display** <u>consisted</u> of a bunch of coloured points called pixels. A pixel <u>was</u> an object. It <u>had</u> a position which <u>consisted</u> of the row and column it <u>was</u> in. Its colour <u>was</u> specified as three numbers – called RGB (Red, Green, Blue) values. The pioneers of computers <u>wrote</u> code in **machine language**, but no one does it these days.

Task 11. Complex Task

Read the article about one of the trends in programming. Answer the following questions:

1. What does the author mean by saying "programming is no longer the sole preserve of an engineering priesthood"?
2. What is the problem of the current approach to the software development?
3. Why is such an approach dangerous?
4. How can we paraphrase the statement "a way to hit reset"?
5. How can the current situation be changed?

The Future of Programming

Programming is changing. The PC era is coming to an end, and software developers now work with an explosion of devices, job functions, and problems that need different approaches from the single machine era. In our age of exploding data, the ability to do some kind of programming is increasingly important to every job, and programming is no longer the sole preserve of an engineering priesthood.

Nevertheless, it's worth examining the house of cards we're building with our current approach to software development. The problem is simple: the brain can only fit so much inside it. To be a programmer today, you need to be able to execute the program you're writing inside your head.

When the problem space gets too big, our reaction is to write a framework that makes the problem space smaller again. And so we have operating systems that run on top of CPUs, libraries and user interfaces that run on top of operating systems, application frameworks that run on top of those libraries, web browsers that run on top of those, JavaScript that runs on top of browsers, JavaScript libraries that run on top of JavaScript. And we know it won't stop there.

We're like ambitious waiters stacking one teacup on top of the other. Right now, it looks pretty wobbly. We're making faster and more powerful CPUs, but getting the same kind of subjective application performance that we did a decade ago. Security holes emerge in frameworks that put large numbers of systems at risk.

Why should we use computers like this, simultaneously building a house of cards and confining computing power to that which the programmer can fit in their head? Is there a way to hit reset on this view of software?[5]

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[5] The text is borrowed and modified from http://radar.oreilly.com/2013/01/the-future-of-programming.html as of 20th March 2013.

Lesson 4

Whole-Class Activity

Task 12. Do or check Tasks 1-2 in your Workbook (10 minutes).

Task 13. Be ready to report the results of your Internet search (Task 3). Ask each other questions about programming prodigies (10 minutes).

Task 14. In groups, discuss the following questions. Consult the information box if necessary (5 minutes):

1. What are the steps of software creation?
2. At what step of software creation can a test case be used?
3. What is the purpose of a test case?
4. What can be checked using a test case?
5. What are the sections of a test case?
6. What sections of a test case are the most important?
7. What additional sections may also be included?

A **test case** in software engineering is a set of conditions or variables under which a tester will determine whether an application or software system is working correctly.

A test case is usually a single step, or a sequence of steps, to test the correct behaviour/functionality, features of an application. An expected result or expected outcome is usually given.

The sections of test case often include:

- test case ID
- test case description
- related requirements (equipment, environment)
- author
- test step or order of execution number
- expected result
- actual result
- pass/fail
- remarks

Task 15. Read the following style guide on writing a test case. Judging from the content of the text and Task 14, decide which parts are essential and which are optional in the test case (15 minutes).

Test Case Style Guide

A good test case is one which has higher probability of finding defect(s) that are not already discovered. Writing good test cases is very important for testing to be successful. There are four main fields in a test case:

1) Test case name. This field is the main way to identify a test case. It is a short, direct description about what the test is intended for.

Examples:

- [ADM0110] Create an account.

2) Description. This field should explain what the test case is about, in order to complement the Name.

Examples:

- Test case: [ADM0110] Create an account

Description: Creation of an account with rights to perform basic operations.

3) **Steps.** Steps are probably the most important field of a test case. It describes in a detailed sequence what have to be done in order to achieve the test case results. Steps need to be precise, nonambiguous and easy to follow.

Example:

- Login with Openbravo user .
- Go to General setup->Application->Instance Activation.
- Check that Subscription status is Inactive.
- Click in "Register Online" button.
- Select Testing as "Main Purpose".
- Click Ok.

4) Expected results. As a consequence of the execution of the test cases, something has to be observed in the application. That will lead test executor to decide whether execution was successful or not.

Example:

- A "Process completed successfully" message is displayed.
- The Subscription Status is now Active.

Remember that test cases should be as detailed as possible and should not be written at high level. Writing detailed test steps is very important.

Write test cases in simple plain English that can be understood by anybody who is reading it, do not try to use words or sentences that can lead to ambiguity. This point is very important as your test cases might be reviewed or executed by your counter parts who can be from a different country. Remember, intelligence lies in making complicated things look simple and not in making simple things look complicated.[6]

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[6] The text is borrowed and modified from http://www.softwaretestingsoftware.com/test-case-example/ and http://wiki.openbravo.com/wiki/Test_Case_Writing_Guidelines as of 17th May 2013.

Task 16. Analyse the following test[7] case and answer the questions (5 minutes):

> ➢ What ID and name does the test case have?
> ➢ What is the purpose of the test case?
> ➢ Who is the test case written by?
> ➢ What equipment and environment are needed to perform the test case?
> ➢ How many steps does the test case have?
> ➢ What should be done in the first step of the test case?
> ➢ What is the expected result of the second step?
> ➢ What should happen after the third step is complete?

Test case ID:	GTH5678	
Test case name:	Save a file: test for invalid characters in filename	
Author:	Test Engineer 4	
Test equipment/environment	PC with word processing software installed	
Test setup		
Step number	Description	Expected result
1	Left-click on the Save File icon	Word processor displays the Save As window
2	In the Filename field: enter a file name consisting of < 254 characters with one of the following characters somewhere in the filename: "Greater than" sign (>) "Less than" sign (<) Quotation mark (") Colon (:) Semicolon (;) Left-click the <Save> button	Error message: "The filename, location or format is not valid. Type the filename and location in the correct format"
3	Left-click the <OK> button on the error message. Press <Escape> key to exit the Save function	Return to document screen

---

[7] The text is borrowed and modified from http://www.codentest.com/manualTestCases.php as of 19th May 2013.

Differentiated Activity

Task 17. Tiered Task

Choose and complete any part of this task.[8] You have 10 minutes to do this task and check the results.

Part 1. Having analysed the test cases from Tasks 16 and 18, make up a template for a test case.

Part 2. Compare test cases A and B and answer the following questions:

What is the purpose of these test cases?

What do they have in common and what is different?

What is the result of each test case?

A.

Test case ID: 001				
Author: Test Engineer 1				
Description: Test "Save" button with valid values in mandatory fields				
Test steps:		**Expected Result**	**Actual Result**	**Status**
Step 1	Enter valid values in "Name"	The information should be saved	The information is saved	Pass
Step 2	Enter valid values in "Email"			
Step 3	Click "Save"			

B.

Test case ID: 002				
Author: Test Engineer 1				
Description: Test "Save" button with invalid values in mandatory fields				
Test steps:		**Expected Result**	**Actual Result**	**Status**
Step 1	Enter invalid values in "Name"	The information should not be saved. System should request the user to enter valid values.	The information is not saved. System does not request the user to enter valid values.	Fail
Step 2	Enter invalid values in "Email"			
Step 3	Click "Save"			

Part 3. Compare test cases C and D and answer the following questions:

What do these test cases have in common and what is different?

Which test case is better and why?

What sections can be added to the form of these test cases?

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[8] The texts are borrowed and modified from http://www.softwaretestingsoftware.com/test-case-example/ as of 17th May 2013.

C.

Step #	Step Description	Expected Result
Step 1	Login to test application with valid user ID/Password	Home page is displayed
Step 2	Click "Logout" link on home page	Login page is displayed

D.

Step #	Step Description	Expected Result
Step 1	Open URL http://www.example.com/login.asp	Login page is displayed and contains the below fields: a)"User Name" text field b)"Password" text field c)"Submit" button
Step 2	Once Login page is displayed, enter valid user ID/password a)Enter "User1" in "User Name" text field b)Enter "1111" in "Password" text field	a)Verify "User Name" is populated with text "User1" b)Verify text entered in "Password" field is masked and is not readable
Step 3	Click "Submit" button	Verify application "Home" page is displayed a)Verify "Home" page displays "Welcome User1" message on top left navigation Menu b)Verify left Navigation menu contains links "Directory", "Submission", "Latest Links", "Logout"
Step 4	Click "Logout" link on the left menu	Verify user is successfully logged out of the application and application login page is displayed

Task 18. 🔊 Listening

You are going to watch a video about writing effective test cases. Choose any part of the task you feel confident to complete or do them all (10 minutes).

Use the following link to watch the video: http://www.youtube.com/watch?v=7BKUn5TzAIE

Part 1. Insert the words into the gaps:

Writing effective test cases will help whoever is (1)……….. the test case. To start off, you should have (2)………… steps in a test case. If you only have a couple of test steps, use a checklist instead. When you write a test case, you don't need to specify the (3) ………. result for each test step, if the result is obvious. However, when testers report (4) ………. based on the test case, they should indicate which test step (5) ……… . This will make (6) ………….. easier. If your

test case has too many (7) …….. you should break it up into smaller sets. Long test cases may be confusing for the developer who has to fix the (8) ………. as well as future testers who would have to (9) ……… all the steps to test it. Lastly, only use pre-conditions if you need them. For example, if you have to load a set of customers into the (10) ……… before testing begins then you need pre-condition. If not, leave the field it blank.[9]

Part 2. Answer the following questions:

1. Who can an effective test case help?
2. How many steps should a test case have?
3. What doesn't need to be done for each test step if the result is obvious?
4. What can make troubleshooting easier?
5. What should be done if a test case has too many steps?
6. When should pre-conditions be used?

Part 3. Name four tips for writing a successful test case which were mentioned in the record. Make notes while listening if necessary.

Task 19. Tiered task

Choose any part of the task you feel confident to complete or do them all.[10] You have 10 minutes for this activity.

Part 1. Insert the words in the gaps.

(1)…………: B 001
 Test Description: verify bold formatting to the text
(2)………..: Thomas Jackson
 Function to be tested: bold formatting to the text
 Environment: (3) ………….
 Test Execution:
 1. Open (4) ………….
 2. Open new document
 3. (5) ………. any text
 4. Select the text to make(6) ………..
 5. Click **Bold**
 (7) ………….. Result: Applies bold formatting to the text
 (8) …………… Result: **pass**

Part 2. Deduce and insert the missing parts of the test case.

> **Test Case #:** 2.2
> **Test Case Name**: (1)………….
> **Designed by**: ABC

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[9] The text and the record are borrowed and modified from http://www.youtube.com/watch?v=7BKUn5TzAIE as of 22d May, 2013.

[10] The text is borrowed and modified from http://faculty.ksu.edu.sa/ghazy/CSC342_Tools/Test%20Case%20Template.pdf as of 22d May, 2013.

Short Description: Test the ATM Change PIN service
Pre-conditions
 – The user has a valid ATM card
 – The user has accessed the ATM by placing his ATM card in the machine
 – The current PIN is (2) ………….
 – The system displays (3) …………..

Step	Action	Expected System Response	Pass /Fail	Comment
1	(4)………………	The system displays a message asking the user to enter the new PIN		
2	Enter '5555'	The system displays a message asking the user to confirm (re-enter) the new PIN		
3	(5) ……………	The system displays a message of successful operation The system asks the user if he wants to perform other operations		
4	Click 'YES' button	(6) ………………		

Part 3. Write a short test case to ensure that application behaves correctly if a printer is not available.

Task 20. Project work

Imagine that your company is going to release a new browser game this month. You have been divided into three teams in order to test the game for the following:

Team 1. Prepare a test case to ensure that the game starts properly.

Team 2. Prepare a test case to ensure that the game shows "Save" window when exiting the game.

Team 3. Prepare a test case to ensure that audio settings of the game work properly.

Divide responsibilities inside your team so that everyone is involved. Remember that your test case should have the following parts:

➢ *Test ID*
➢ *Test name*
➢ *Pre-conditions*
➢ *Steps descriptions*
➢ *Expected result*
➢ *Actual result (pass / fail)*

After completing the test case, pass it to the other team for peer-checking. You have 15 minutes to perform and check the task.

Optional Activity

Task 21. Facilitated Task

Read the following test case.[11] Some parts have been removed from their places. Restore the original form of the test case by placing the extracts 1-8 into the gaps (a-h).

1. Enter Valid username and invalid password, click on Sign In button.

2. The error message is displayed below username text field saying "Enter the correct password above".

3. The welcome page is opened.

4. The error message is displayed saying "Enter your email address and password".

5. Enter only valid password and click on Sign In button.

6. Enter valid username and password and click on Sign In button.

7. Enter invalid username and password and click on Sign In button.

8. The welcome page is opened.

Step	Step Description	Expected Result	Status
1	Open the browser and enter www.gmail.com in the URL and either double click or hit Go button on the browser	(a)…………………………...	
2	(b)…………………………….	The Inbox page is opened	
3	Logout from the session	(c)……………………………	
4	Enter only valid password and click on Sign In button	(d)……………………………	
5	(e)……………………………	The error message is displayed below username text field saying "Enter your email address"	
6	Directly click on Sign In button	(f) …………………………	
7	(g)………………………………	The error message is displayed below password text field saying "Enter the correct password above"	
8	(h)………………………………	The error message is displayed below username text field saying "Enter your email address and password"	

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[11] The text is borrowed and modified from http://www.docstoc.com/docs/55162489/Sample-Test-Case-Writting as of 4th April, 2013.

Task 22. Complex Task

Look at the following flowchart describing the procedure of software installation.[12] On the basis of this flowchart, write your test case using the templates from this unit as examples.

```
                    ┌──────────────────┐
                    │   Run setup.exe   │
                    └──────────────────┘
                             │
                             ▼
              Yes         ◇ Previous           No
         ┌───────────────  installation  ──────────────┐
         │               detected? ◇                   │
         │                                              │
         │               ┌──────────────────────┐      │
         │               │ Select destination path │◄───┘
         │               └──────────────────────┘
         │                         │
         │                         ▼
         │               ┌──────────────────────┐
         └──────────────►│ Choose installation options │
                         └──────────────────────┘
                                   │
                                   ▼
                         ┌──────────────────────┐
                         │   Begin installing    │
                         └──────────────────────┘
                                   │
                                   ▼
              Yes          ◇ Reboot          No
         ┌───────────────   from    ──────────────────┐
         │               installer? ◇                  │
         │                                             │
         │               ┌──────────────────────┐     │
         │               │ Quit setup.exe and    │◄────┘
         │               │  reboot manually      │
         │               └──────────────────────┘
         │                         │
         │                         ▼
         │               ┌──────────────────────┐
         └──────────────►│ Complete any remaining │
                         │   installer tasks      │
                         └──────────────────────┘
                                   │
                                   ▼
                         ┌──────────────────────┐
                         │    Installation       │
                         │     complete          │
                         └──────────────────────┘
```

---
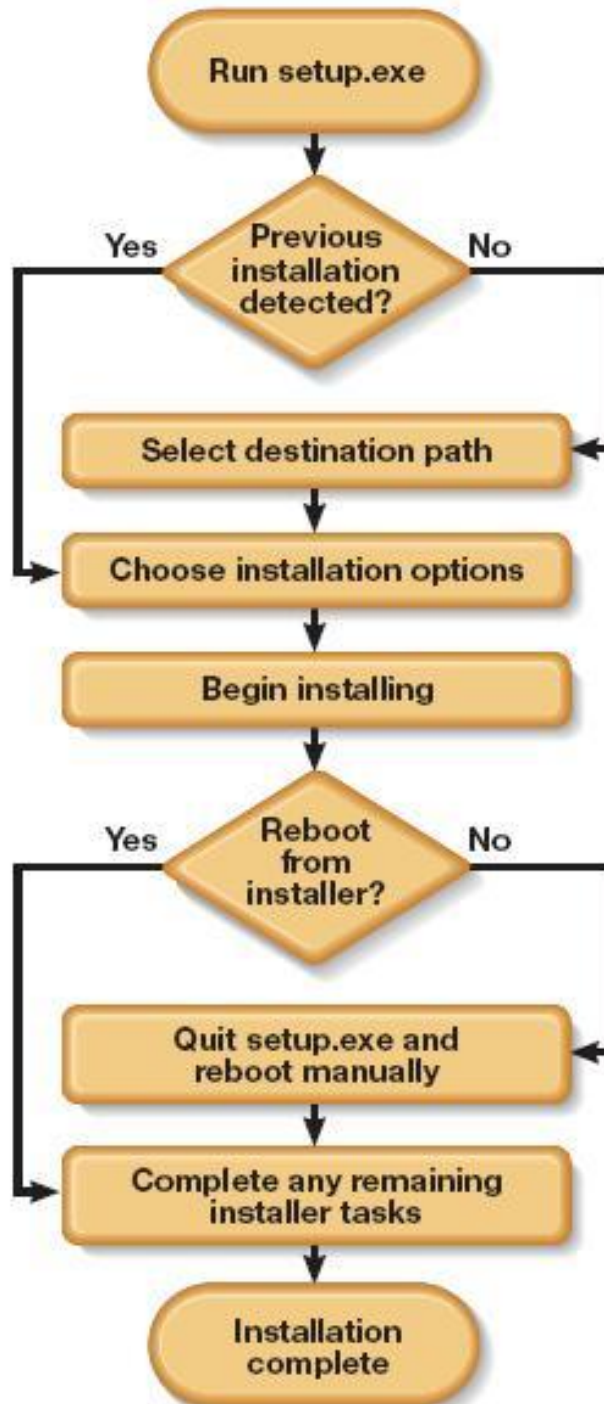
[12] The picture is borrowed from http://www.softwaretestinghelp.com/software-installationuninstallation-testing/ as of 4th April, 2013.

Unit 3. Expert System

Lesson 5

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about expert systems. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. What kind of complicated tasks can a computer perform?
2. Is it rational to trust a computer in the sphere of health care?
3. In what areas is computer analysis better than human expertise?

Analytical Concern

1. What are the advantages of computer expert systems?
2. What are the disadvantages of computer analysis?
3. In what spheres is it possible to use computer analysis only?

Practical Concern

1. What does the term "expert system" mean?
2. In what way are expert systems connected with artificial intelligence (AI)?
3. Where can AI devices be applied?

Creative Concern

1. How did sci-fi writers see the possibilities of AI technologies?
2. What home appliance would benefit from the use of AI the most?
3. How will AI technologies look like in 20 years?

Task 2. Reading

Read the text about expert systems and answer the questions. You have 20 minutes for this activity.

1. What is an expert system?
2. What structure does an expert system have?
3. What is knowledge base expressed with?
4. What is an inference engine?
5. What are the ways to run an inference engine?
6. In what spheres are expert systems used?

Simulating Human Thought

There is a class of computer programs, known as **expert systems** that aim to simulate human reasoning. The methods and techniques used to build these programs are the outcome of efforts in a field of computer science known as Artificial Intelligence (AI).

An expert system has a unique structure, different from traditional computer programming. It is divided into two parts: one fixed – the inference engine and one variable – the knowledge base. To run an expert system, the engine reasons about the knowledge base like a human. In the 80s a third part appeared: a dialog interface to communicate with users.

In expert system technology, the **knowledge base** is expressed with natural language rules IF ... THEN ... For example:

"IF it is living THEN it is mortal"

"IF his age = known THEN his year of birth = current year – his age in years"

This formulation has the advantage of speaking in everyday language which is very rare in computer science (a classic program is coded). Nevertheless, there exist other formulations of rules, which are not in everyday language, understandable only to computer scientists. Each rule style is adapted to an engine style.

The **inference engine** is a computer program designed to produce a reasoning on rules. In order to produce a reasoning, it should be based on logic. With logic, the engine is able to generate new information from the knowledge contained in the rule base and data to be processed.

The engine has two ways to run: batch or conversational. In batch, the expert system has all the necessary data to process from the beginning. For the user, the program works as a classical program: he provides data and receives results immediately. Reasoning is invisible. The conversational method becomes necessary when the developer knows he cannot ask the user for all the necessary data at the start, because the problem is too complex. The software must "invent" the way to solve the problem, request the missing data from the user, gradually approaching the goal as quickly as possible. The result gives the impression of a dialogue led by an expert.

Expert systems have been built to diagnose disease, find mineral deposits, translate natural languages and solve complex mathematical problems. Other spheres of its use include interactive or conversational applications, voice server, fault diagnosis, decision support in complex systems, process control, interactive user guide, educational and tutorial software, logic simulation of machines or systems etc.
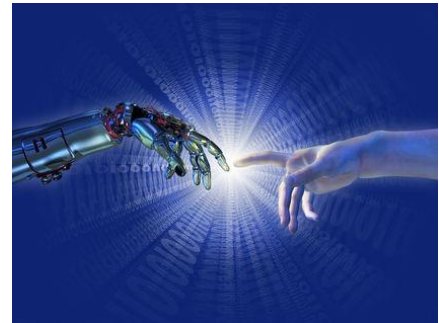
A strong interest in using expert systems is that this kind of software is able to give the user clear explanation of what it is doing (the "Why?") and what it has deduced (the "How?"). Nevertheless, expert systems still remain supplements, rather than replacements, for human experts.[13]

Task 3. Vocabulary Practice

Match the terms (1-8) with their definitions (a-g). You have 5 minutes for this task.

Expert system	a) a set of digitized facts, rules, cases, and models
Knowledge base	b) computer program designed to produce a reasoning on rules
Inference engine	c) a class of computer programs that aim to simulate human reasoning
Batch method	d) way of inference engine work, when the software requests the missing data from the user, gradually approaching the goal
Conversational method	e) a process of finding faults arising in systems
Fault diagnosis	f) a computer program which purpose it is to assist users in learning something
Tutorial software	g) way of inference engine work, when the expert system has all the necessary data to process from the beginning

Task 4. Vocabulary Practice

There are several suffixes in English which help to form nouns from verbs. Study the following examples of these suffixes and after doing so, make up derivatives from the words in brackets. You have 5 minutes for this task.

-**tion** (generate – generation, calculate – calculation)
-**ment** (judge – judgment, punish – punishment, move – movement)
-**ing** (draw – drawing, code – coding, debug – debugging)
-**ence** (differ – difference, present – presence)
-**er, -or** (manage – manager, develop – developer, create – creator)

Expert systems are computer (**apply**) that combine computer (**equip**), software, and specialized (**inform**) to imitate expert human (**reason**) and advice. As a branch of artificial intelligence, expert systems provide discipline-specific (**maintain**), advice and (**explain**) to their (**use**). While artificial intelligence is a broad field covering many aspects of computer-generated (**think**), expert systems are more narrowly focused.

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[13] The text is borrowed and modified from http://www.perfectlogic.com/articles/AI/ExpertSystems/ExpertSystems.html and http://en.wikipedia.org/wiki/Expert_system as of 1st June, 2013.

Typically, expert systems function best with specific activities or problems and specific database of facts and rules. Expert systems are used widely in commercial and industrial (**set**), including medicine, finance, (**manufacture**), and sales.[14]

Task 5. Language in Use

Passive voice is often used in the field of scientific and professional communication. Study the table below where the grammatical peculiarities of Passive voice are explained. After doing so, transform the active sentences into passive ones. You have 10 minutes for this task.

Passive Voice

Passive voice is a specific grammatical form of Verbs. Passive voice is used when the focus is on the action and it is not important or not known who or what is performing the action. Passive voice is formed with the help of the verb *be* in appropriate tense form and *past participle*. When changing active sentence into passive sentence note that:

- the object of the active sentence becomes the subject of the passive sentence
- the subject of the active sentence becomes the object of the passive sentence (or is dropped)

Tense	Voice	Example
Present Simple	Active	Developers **create** expert systems to diagnose disease.
	Passive	Expert systems **are created** (by developers) to diagnose disease.
Past Simple	Active	Developers **created** expert systems to diagnose disease.
	Passive	Expert systems **were created** to diagnose disease.
Present Perfect	Active	Developers **have created** expert systems to diagnose disease.
	Passive	Expert systems **have been created** to diagnose disease.
Past Perfect	Active	Developers **had created** expert systems to diagnose disease.
	Passive	Expert systems **had been created** to diagnose disease.
Future Simple	Active	Developers **will create** expert systems to diagnose disease.
	Passive	Expert systems **will be created** to diagnose disease.
Present Continuous	Active	Developers **are now creating** expert systems to diagnose disease.
	Passive	Expert systems **are being created** to diagnose disease.
Past Continuous	Active	Developers **were creating** expert systems to diagnose disease.
	Passive	Expert systems **were being created** to diagnose disease.
Modal verbs	Active	Developers **can create** expert systems to diagnose disease.
	Passive	Expert systems **can be created** to diagnose disease.

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[14] The text is borrowed and modified from http://www.referenceforbusiness.com/encyclopedia/Ent-Fac/Expert-Systems.html as of 1st June, 2013.
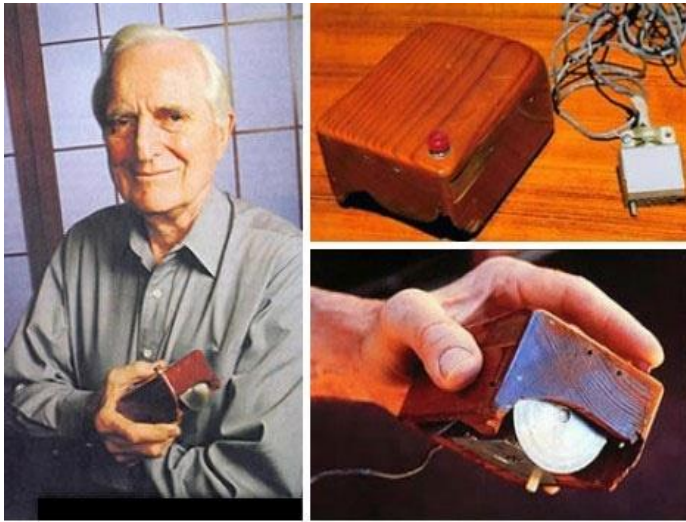
1. Konrad Zuse developed the first electro-mechanical computer in 1939.
2. Hackers release over 6,000 new computer viruses every month.
3. Dough Engelbart constructed the first computer mouse in 1964.
4. People register over 1 million domain names every month.
5. People created the first hard drive which could hold 5 MB of data in 1979.
6. An average video card uses 200 million transistors.
7. Artificial intelligence system can compose music in the style of the composers of the past.
8. People released first web browser Mosaic in 1993.
9. People consider Alan Turing to be the father of AI.
10. People will use more than 2 billion computers in 2015.

Differentiated Activity

Task 6. Group activity

In groups, study the content of the text from Task 2 once more and accomplish one of the following tasks. Report your findings to the class. You have 10 minutes for this task.

Part 1. Make up synonyms or give an explanation to the following words from the text. Explain their meaning to your group mates, so that they can guess what word you are talking about.

Simulate, outcome, field, to reason, rare, conversational, provide, complex, fault, to deduce, supplement, replacement.

Part 2. Explain the following scheme. Choose the appropriate title for it.
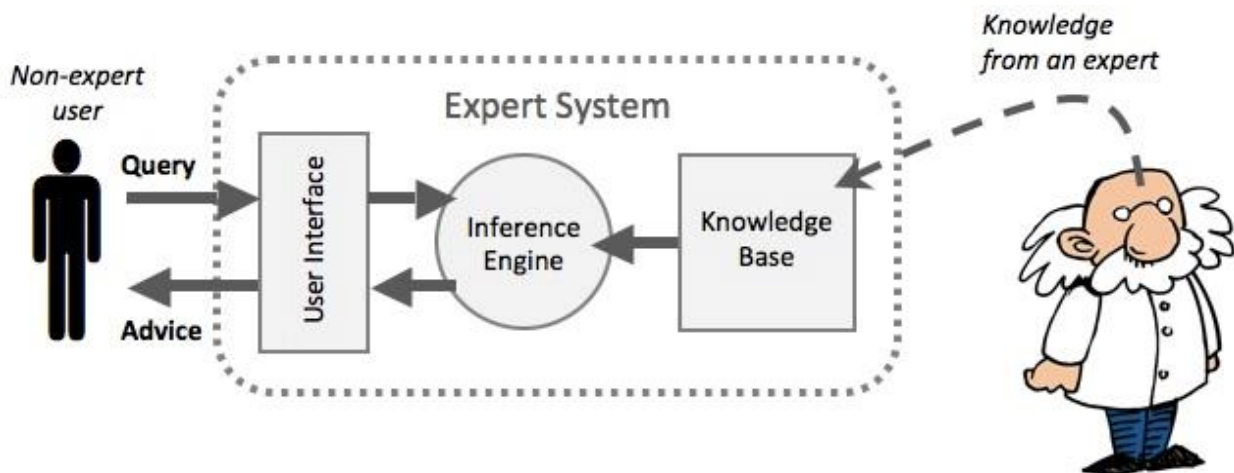
Part 3. Make a list of the fields where an expert system can be used and explain how. From the list you have made, choose the sphere where an expert system is most needed and the sphere, where it is not demanded.

Task 7. 🔊 Listening

You are going to watch a video about an expert system. Choose whatever part you feel confident to complete or do them all. You have 10 minutes for the task. Use the following link to watch the video: https://www.youtube.com/watch?v=w5Vc2zkwa14.

Part 1. Fill in the gaps with the missing information.

COGITO is 1) ………… semantic intelligence platform. It is a technology that takes any kind of text 2) ………. in any kind of format and 3) …………. a deep

linguistic analysis by going through all the different steps which lead up to the semantic 4) ………. . The system is then able to understand the meaning of words based on their 5) ………... . The outcome of the analysis is the 6) …………… , basically, a structured representation of the content, which is then used to run different kinds of 7) ………….. from semantic searchers, to automatic categorization, to competitive intelligence 8) ………… , to natural language interfaces – all which enable a very 9) …………… , fast and precise automatic management of 10) …………. information.

Part 2. Complete the sentences and make up definitions of the terms.

1. COGITO is …
2. Semantic analysis enables system to …
3. Conceptual map is basically …
4. The first feature of COGITO is …
5. The second important feature is …

Part 3. Explain the two important features of the COGITO system using the sentences given in the text as examples.

Task 8. Pair work

Write down 5 sentences with Active verbs on a separate piece of paper. After doing so, switch papers with your partner and rewrite the received sentences using Passive Voice. You have 10 minutes for this task.

Task 9. Team work

You are going to be divided into 2-3 teams. Each team chooses the captain and the name of the team.

In every team, you have to make a list of advantages and disadvantages of the use of artificial intelligence devices. Try to make your lists as long as possible. You have 5 minutes for this task. After that teams read the points from the lists they have made one by one and discuss them if necessary. The team, which has the longest list of advantages or disadvantages wins.

You have time until the end of the class for this activity.

Advantages	*Disadvantages*
………………………………………	……………………………………
………………………………………..	……………………………………….
………………………………………	………………………………………

Optional Activity

Task 10. Facilitated Task

a) Read the following text. The underlined verbs belong to Future Simple tense and denote things which will happen in future. Analyse these grammatical forms and deduce the rules of forming Future Simple tense.

An expert system is a program running on a computer. Like a human expert, it knows a lot about a subject. People can ask the expert system a question. The **expert system <u>will use</u>** a set of rules and give answers to the question. This method of automatic reasoning belongs to a field of computer science called artificial intelligence.

Different groups of people can have different kinds of access to an expert system. The people managing the network of computers have different needs than the office worker or secretary.

Expert systems are made of a set of facts, rules and principles, a set of data that is solved using its expertise and a user interface.

When they are asked a question, **they <u>will filter</u>** the data with the rules they have. After that **they <u>will give back</u>** a result, or ask an additional question.

b) Rewrite the text in Future Simple tense.

Task 11. Complex Task

Read The New York Times article about the advances in AI. Answer the following questions:

1. What is "deep learning"?
2. What examples of advances in AI are given in the article?
3. Which example is most striking in your opinion?
4. In what sphere has computer outperformed human?
5. What are the possibilities of using AI at conferences?
6. What does the phrase "There's no looking back now" from the last paragraph mean?

Scientists See Promise in Deep-Learning Programs

The advances in artificial intelligence have led to widespread enthusiasm among researchers who design software to perform human activities like seeing, listening and thinking. They offer the promise of machines that converse with humans and perform tasks like driving cars and working in factories, raising the spectre of automated robots that could replace human workers.

The technology, called deep learning, has already been put to use in services like Apple's Siri virtual personal assistant. But what is new in recent months is the

growing speed and accuracy of deep-learning programs, often called artificial neural networks or just "neural nets" for their resemblance to the neural connections in the brain.

In October (2012), for example, a team of graduate students studying with the University of Toronto computer scientist Geoffrey E. Hinton won the top prize in a contest sponsored by Merck to design software to help find molecules that might lead to new drugs. From a data set describing the chemical structure of thousands of different molecules, they used deep-learning software to determine which molecule was most likely to be an effective drug agent.

Advances in pattern recognition hold implications not just for drug development. Deep-learning systems have recently outperformed humans in certain limited recognition tests. Last year, for example, a program created by scientists at the Swiss A. I. Lab at the University of Lugano won a pattern recognition contest by outperforming both competing software systems and a human expert in identifying images in a database of German traffic signs. The winning program accurately identified 99.46 percent of the images in a set of 50,000; the top score in a group of 32 human participants was 99.22 percent, and the average for the humans was 98.84 percent.

Deep learning was given a particularly audacious display at a conference last month in Tianjin, China, when Richard F. Rashid, Microsoft's top scientist, gave a lecture in an auditorium while a computer program recognized his words and simultaneously displayed them in English on a large screen above his head.

Then, in a demonstration that led to stunned applause, he paused after each sentence and the words were translated into Mandarin Chinese characters, accompanied by a simulation of his own voice in that language, which Dr. Rashid has never spoken.

In conclusion, we`d like to quote the words of Dr. Hinton referring to the rapid deep-learning advances made possible by greater computing power, and especially the rise of graphics processors:

"The point about this approach is that it scales beautifully. Basically you just need to keep making it bigger and faster, and it will get better. There's no looking back now".[15]

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[15] The text is borrowed and modified from http://www.nytimes.com/2012/11/24/science/scientists-see-advances-in-deep-learning-a-part-of-artificial-intelligence.html?_r=4&pagewanted=all& as of 1st June, 2013/

Lesson 6

Whole-Class Activity

Task 12. Do or check Tasks 1-2 in your Workbook (10 minutes).

Task 13. Report the results of your Internet search to the class. Ask each other questions about your experience of having a conversation with Cleverbot (10 minutes).

Task 14. Discuss the following questions for 5 minutes. Turn to the help box if necessary:

1. What is a CV?
2. What does "CV" stand for?
3. What is the aim of a CV?
4. What is the necessary length of a CV?
5. What sections does a CV include?
6. How often should a CV be updated?
7. How important is a CV in the process of job search?
8. What style of language is used in a CV?
9. What is the most important information in a CV?

A **curriculum vitae** (**CV**) is a document which provides an overview of a person's experience and other qualifications.

In some countries, a CV is typically the first item that a potential employer encounters regarding the job seeker and is typically used to screen applicants, often followed by an interview.

A CV is short (usually a maximum of two sides of A4 paper), and therefore contains only a summary of the job seeker's employment history, qualifications and some personal information. It is often updated to change the emphasis of the information according to the particular position for which the job seeker is applying.

A CV commonly includes the following sections:

• Personal information (name, address, phone number)
• Profile
• Skills and competences
• Work experience
• Education
• Interests

Task 15. Look through the following elements (1-13) and decide which sections of a CV they belong to. Place the elements into the template. You have 5 minutes for this task.

1. **SUMMARY OF QUALIFICATIONS**

2. **TECHNICAL SKILLS**

3. **PROFESSIONAL EXPERIENCE**

4. **EDUCATION**

5. *Talented Systems Analyst with expertise in requirements, testing, and implementation*

6. **ABC co., New York**
    2007-Present
    System Analyst for IT firm with
    1, 500 employees

7. JACOB REYNOLDS
    534 Dice Way | Tucson, AZ 857443
    | 800-030-0030 |
    jacob.reynolds@dice.com

8. Bachelor of Science in Information Systems
    University of Arizona, Tucson, AZ (2000)

9. **DEF Inc, Washington**
    2003-2007
    System analyst/ Quality Assurance
    for major manufacturer with
    2, 000 employees

10. **Programming:** SQL, Java, HTML/XML, C++, C, UNIX, Perl, Sybase
    Applications: Microsoft Office Suite, Visio, MS Project, SAP, COBOL, Rational Rose
    Databases: Access, Oracle, ASCII, DB2
    Platforms: Microsoft Vista/XP/2003, Mac, Linux, Solaris
    Networking: Ethernet, TCP/IP, VPN, LAN/WAN

11. • 8 years of experience as Systems Analyst with focus in business software and systems;
    • strong background working with clients, designers, and programmers to identify requirements, provide cost analysis, assist with creating user interfaces;
    • in-depth understanding of project lifecycle, including all phases of system and software development;
    • proven track record in testing, quality assurance, and networking;
    • superior communication, presentation, and interpersonal skills.

12. – Tested applications and resolved complex problems throughout software development life cycle (SDLC), including preparing detailed program specifications.
    – Played key role in design and development activities to ensure software requirements were met.
    – Participated in design analysis and pre- and post-installation reviews.

60

13. – Maintained and supported systems for data warehouse.
– Performed data analysis, testing, debugging, audits, disaster recovery, and problem resolution.
– Researched and evaluated technology solutions and presented recommendations for improved system operations.

Task 16. CV: Writing Techniques

Read the text about writing a CV. Answer the questions (15 minutes).

1. What sections of a CV are the most important?
2. What sections of a CV may be tailored according to a specific job?
3. What are the common mistakes / difficulties in writing a CV?

How to write a successful CV before applying for a job

A good curriculum vitae – or CV – is vital when looking for work, especially when there are numerous candidates for the same job, so what should it contain?

There is no perfect template, and each sector may require a different emphasis on a different aspect of the content, such as career history or qualifications.

However, experts suggest there are some basic rules on how a CV should be written and the information that should be included.

Overall, a CV should be neat and typed if possible. It should also be short, usually no more than two sides of A4. It should be positive, stressing achievements and strengths, and make a good impression in a clear and positive way.

The basic format for a CV includes:
- Personal details, including name, address, phone number, email address and possibly any professional social media presence;
- Career history, starting with your most recent job first. Include dates and temporary or voluntary jobs if appropriate;
- A personal profile which sells yourself and your qualities, tailored towards the job you are applying for;
- Achievements from previous jobs that are relevant;
- Qualifications and training from previous jobs, with the most recent first;
- Interests, if they are relevant and especially if the skills or teamwork concerned are relevant for the job;

- Any extra information, such as reasons for a career change or reasons for gaps in career history, such as caring duties;
- References, ideally two or more and including a recent employer.

Corinne Mills is a managing director of Personal Career Management, which offers careers coaching. She says that a straightforward font and formatting is required - and the spelling must be checked and checked again.

"Poor spelling is the quickest way of getting a rejection," she says.
She adds that people should check five or six adverts for a particular job and then use the common requirements to mould their CV.

"Many people think that one CV will fit all applications, but it needs to be a very targeted document for the role they are going for. Do some research so you understand what employers are looking for".[16]

Task 17. When writing a CV you will often feel the need to explain what kind of work you can do or what you have already done. Study the table and fill in the column with the words / phrases from the box (5 minutes).

working with clients, cost analysis, testing, quality assurance, networking, data warehouse, data analysis, debugging, audits, disaster recovery, problem resolution, data verification methods, complex problems, detailed program specifications, design analysis, updating technical documentation, user account profiles and passwords.

Responsible for	
Assist	
Create and maintain	
Conduct	
Test	
Resolve	
Play key role in	
Participate in	
Perform	
Prepare	

[16] The text is borrowed and modified from http://www.bbc.co.uk/news/business-15573447 as of 16th March 2013.

Differentiated Activity

Task 18. Tiered task

Read the text about the most important tips in writing a CV and fill in the gaps.

Part 1. Fill in the missing information.

The best way to start your CV is with a (1) ………. statement. Use a short (2) ………… statement that grabs (3) ………… and really sells you to the recruiter. This gets them interested and wanting to read more about you.

When (4) ……….. an overview of your (5) ………… history, all you need to give are employers' names, dates and (6) ……….... Don't waste valuable time going into (7) ………. with full job descriptions or specific (8) ………….; you can do this at the interview (9) ………. A brief summary of your (10) ……….. is important too especially for younger people as most of your (11) ………… comes from your time in education.

Including your (12) ………… is very important as they demonstrate a commitment to delivering an (13) ……….., as well as an ability to work hard in pursuit of a goal. Finally, and probably most importantly, give your (14) ………. to let your employer get in touch with you and offer the (15)…………..

1	profile	bold	true
2	nominative	descriptive	interrogative
3	eye	time	attention
4	explaining	providing	outlining
5	employment	working	studying
6	personal data	job titles	photos
7	details	descriptions	memories
8	days	statements	responsibilities
9	after	sooner	stage
10	education	life	travels
11	skills	work	experience
12	qualifications	titles	hobbies
13	service	objective	money
14	contact details	post address	Linked in account
15	job	meeting	interview

Part 2. Answer the following questions.

1. What qualities should a profile statement have?
2. What shouldn't be done when providing an employment history?
3. Why is education summary important for young people?
4. What should be shown when writing about training courses?
5. How many interests may be provided in a CV?

Part 3. Give as many writing tips as possible to the suggested parts of a CV.

Profile statement	
Employment history	
Education	
Qualifications	
Training	
Interests	
Contact details	

Task 19. Tiered Task

As you have already got to know, only the most relevant information should be included into a CV. Read the following tasks and write a correct CV. You have 15 minutes for this task:

Part 1. Read the article about John Backus, filter the necessary for a CV information and compile his CV. You may add the missing information.

John Warner Backus was born in Philadelphia, Pennsylvania and grew up in nearby Wilmington, Delaware. He studied at the The Hill School in Pottstown, Pennsylvania, and was apparently not a diligent student. After entering the University of Virginia to study chemistry, he quit and was conscripted into the U.S. Army.
After moving to New York City he trained initially as a radio technician and became interested in mathematics. He graduated from Columbia University with a Master's degree in mathematics in 1949, and joined IBM in 1950. During his first three years, he worked on the Selective Sequence Electronic Calculator (SSEC); his first major project was to write a program to calculate positions of the Moon. In 1953 Backus developed the language Speedcoding, a high-level language created for an IBM computer.
In 1954 Backus assembled a team to define and develop Fortran for the IBM 704 computer. Fortran was the first high-level programming language to be put to broad use.

Backus spent the latter part of his career developing FL (from "Function Level"). FL was an internal IBM research project, and development of the language essentially stopped when the project was finished. Backus retired in 1991.

Backus was named an IBM Fellow in 1963, and was awarded a degree "honoris causa" from the Henri Poincaré University in Nancy (France) in 1989 and a Draper Prize in 1993.[17]

Part 2. Look through the following CV and find mistakes. Rewrite the CV so that it would become more appropriate.

Alexander Rayman
Blackwood Street 65, Mallwill. 0877-456-456, rayman@mallwill.com
Marital Status: married, wife – Jane Rayman, two daughters – Lisa and Janet
Excellent system analyst with overwhelming experience in maintenance and support

Qualifications
  – 5 years of experience in the sphere of system analysis
  – Strong background working with musicians, artists and photographers
  – In-depth understanding of the relationship in the company
  – Superior communication and managing skills

Technical Skills HTML / XML, Java, C++ Microsoft Word, Microsoft Excel, Microsoft Powerpoint Confident Internet user
Professional Experience

Goodwill Inc, Winstone	**2010-Present**

System analyst for huge manufacturing company
  – Performed data and process analysis
  – Researched verification methods and audits
  – Maintained and supported company software, servers, networks	

MDN Lim, Mallwill	**2008-2010**

System Analyst / Content Manager for poor Internet company
  – Created and maintained site selling positions
  – Assisted development team
  – Created technical documentation for software and systems	

Education
1993-2003 – Mallwill public school "A" grades in Mathematics and Art 2003-2008 – Mallwill Technology Institute Degree in Computer Science
Interests Fishing, power-lifting, modeling, reading, listening to music

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[17] The text is borrowed and modified from http://en.wikipedia.org/wiki/John_Backus as of 16th September 2013.

Part 3. Read the following information. On the basis of your experience and having analysed the CV from Task 15, organize the information into a proper CV, keeping in mind the structure and the order of the CV parts.

Alan Miller, 29, Brovenly Street, 23, Festburg

Study: Mallwill public school (1994-2000), Festburg specialized school (2000-2005). Visited school clubs in Math, Art and Foolball. Captained school football team.

Festbur University of Science (2005-2010). "A" grades in Math, Economy and Art. Degree in Computer Science. Selected as President of University and Sports Representative. Participated in scientific conferences dedicated to economical problems. 1st place in the Math contest of Festburg.

Work experience: Worked as shop assistant in 2009-2010 ("MC" Music Shop). Was responsible for delivering a friendly service, smiling, greeting and making an eye contact with every customer that comes to the store. Created sales reports. Quit because wanted to work as System Analyst.

After receiving a degree, started to work as Quality Assuranse/ Tester. My responsibilities included writing test cases and performing tests to ensure the proper work of software.

From 2012 till present work as System Analyst in Golden bank. I maintain and support systems and also perform data analysis. Participate n testing of a software.

Task 20. Pair work

Role-play an interview at a prominent IT company for the position of a System Analyst. You have 15 minutes for this task.

Student A. You are an interviewer. Ask your partner questions about his / her goals, education, work experience and interests. Take notes while doing so.

Student B. You are an applicant. Prepare to answer the questions of your partner.

Switch the roles and after acting out your dialogues and having collected all the necessary information prepare a CV for your partner.

Optional Activity

Task 21. Facilitated Task

Look at the following CV. The headings of the sections have been removed from their places. Insert the headings into the gaps.

| **Curriculum Vitae**
(1)_____
(2)_____: Ann Kovalchuk
(3)_____: 09/04/1990
(4)_____: Ukrainian
(5)_____: T.Shevchenka Street 45, app.21, Kyiv
(6)_____
(7)_____:National Technical University of
     Ukraine "Kyiv Politechnik Institute"
(8)_____: System Analysis
(9)_____
 2010-present
 System Analyst at BTM company, Kyiv – perform
 system analysis of data and support company systems
(10) _____
 Driving licence, C++ programming sertificate
(11)_____
  Programming, sports, tourism | Address,
Date of birth,
Education,
Working
Experience,
Degree,
Interests,
Name,
Nationality,
Other skills,
Personal
information,
Establishment |

Task 22. Complex Task

Sometimes people write strange things on their CVs.[18] Read the following sentences which have been taken from the CVs and find out what is wrong with them. Classify the mistakes and propose your correct variant.

1. Skills: "I can type without looking at the keyboard."
2. References: "Please do not contact my immediate supervisor at the company. My colleagues will give me a better reference."
3. Experience: "My father is a computer programmer, so I have 15 years of computer experience."
4. Objective: "I want to play a major part in watching a company advance."
5. Experience: "I'm a hard worker, etc."
6. Languages: "Speak English and Spinach."
7. Objective: "So one of the main things for me is, as the movie 'Jerry McGuire' puts it, 'Show me the money!'
8. Skills: "I have technical skills that will take your breath away."

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[18] The text is borrowed and modified from http://jobmob.co.il/blog/funniest-resume-mistakes/#ixzz2iFCS6Y2I as of 16th September 2013.

9. Objective: "I need money because I have bills to pay and I would like to have a life, go out partying, please my young wife with gifts, and have a menu entrée consisting of more than soup."
10. Qualifications: "Twin sister has accounting degree."
11. Skills: "Written communication = 3 years; verbal communication = = 5 years."
12. Education: "I possess a moderate education but willing to learn more."
13. Education: "Have repeated courses repeatedly."
14. Salary requirements: "The higher the better."
15. Bad traits: "I am very bad about time and don't mind admitting it. Having to arrive at a certain hour doesn't make sense to me. What does make sense is that I do the job. Any company that insists upon rigid time schedules will find me a nightmare."
16. References: "Bill, Tom, Eric. But I don't know their phone numbers."
17. Objective: "Student today. Vice president tomorrow."
18. Experience: "Any interruption in employment is due to being unemployed."
19. Interests: "Gossiping."
20. Skills: "being bi-lingual in three languages"
21. Education: "I have a bachelorette degree in computers."
22. Objective: "My dream job would be as a professional baseball player, but since I can't do that, I'll settle on being an accountant."
23. Educational background: "High school was an incredible experience."
24. Awards: "National record for eating 45 eggs in two minutes."

MODULE 1 TEST. COMPUTER SYSTEMS

1. A peripheral device that accepts data and feeds it into a computer.

a) input device   b) output device   c) peripherals   d) CPU

2. The physical equipment used in a computer system.

a) software   b) peripherals   c) output   d) hardware
                                               device

3. The programs that can be used with a particular computer system.

a) hardware   b) operating system   c) software   d) peripherals

4. A device that processes data according to a set of instructions.

a) aplication   b) hardware   c) computer   d) motherboard

5. Devices or units that operate separately from the CPU but are connected to it.

a) Peripherals   b) Software   c) Applications   d) Programs

6. Any piece of computer hardware equipment used to communicate the
   results of data processing.

a) Input device   b) Application   c) Peripherals   d) Output
                                                                        device

7. The part of a computer that performs logical and arithmetical
   operations on the data.

a) CPU   b) motherboard   c) hardware   d) mouse

8. Program that allows you to create and modify text documents.

a) Word-processing   b) Photo-editing   c) Content   d) User
   program   program   editor   application

9. The number of distinct pixels in each dimension that can be displayed.

a) Dimension   b) volume   c) clarity   d) resolution

10. A set of instructions executed directly by a computer's central processing unit.

a) machine code   b) compiler   c) binary numbers   d) assembler
                                                                        code

11. Creating a set of instructions that computers use to perform specific
   operations

a) Operating   b) executing   c) programming   d) browsing

12. A computer program that transforms source code written in a programming language into another computer language.

a) Compiler   b) assembler   c) machine   d) application

13. A program which translates from assembly language to machine language format.

a) compiler   b) assembler   c) composer   d) translator

14. Representation of numeric values using two symbols: 0 and 1.

a) machine code   b) binary code   c) assembler language   d) high-level language

15. Programming language with strong abstraction from the details of the computer.

a) assembler language   b) high-level language   c) low-level language   d) machine code

16. A low-level programming language in which there is a very strong correspondence between the language and the machine code instructions.

a) assembler   b) assembler language   c) machine code   d) programming

17.A device that produces sound and music when connected to the computer.

a) speaker   b) column   c) microphone   d) fax

18.It is used to wire all of the computer parts together.

a) CPU   b) housing   c) motherboard   d) hard drive

19. Mouse …………to point to and select items on your screen.

a) is responsible   b) is used   c) enables   d) function

20. A set of conditions or variables under which a tester will determine whether an application or software system is working correctly.

a) test file   b) test case   c) set test   d) set case

21. A set of digitized facts, rules, cases, and models.

a) Tutorial software   b) Inference engine   c) Knowledge base   d) Case law

22. A computer program designed to produce a reasoning on rules.

a) Inference   b) Batch   c) Knowledge   d) Counting
   language   application   base   machine

23. A class of computer programs that aim to simulate human reasoning.

a) Knowledge   b) AI   c) Expert   d) Augmented
   base   system   reality

24. A way of inference engine work, when the software requests the missing
data from the user, gradually approaching the goal.

a) Conversational b) Batch   c) Fault   d) Tutorial
   method   method   diagnosis   Software

25. A process of finding faults arising in systems.

a) Fault   b) Batch   c) debugging   d) cleansing
   diagnosis   process

MODULE 2. NETWORKING SYSTEMS

At the end of this module Students will know:

➢ notions of Computer Networks, the Internet and the World Wide Web;
➢ components of computer networks and their functions;
➢ types of computer networks;
➢ difference between the Internet and the World Wide Web.

At the end of this module Students will understand:

➢ how computer networks work;
➢ the principles of search engine operation;
➢ the difference between types of routers and their functions;
➢ the influence that the Internet has on professional and everyday life.

At the end of this module Students will be able to:

➢ explain the structure of a networked system;
➢ define the functions of network components;
➢ relate some else's words and make questions in professional communication;
➢ write a letter of application and a memo.

Unit 4. Computer Networks

Lesson 7

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about computer networks. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. What impact do computer networks have on our lives?
2. What are the benefits of computer networks?
3. What are the drawbacks of computer networks?

Practical Concern

1. What computer networks do you use?
2. What are the characteristics of computer networks?
3. What skills are needed to use computer networking technology?

Analytical Concern

1. What is the future of computer networks?
2. What aspects should be taken into account when establishing home network?
3. What are the risks of having your own computer network?

Creative Concern

1. What concepts are associated with computer networks?
2. How would you illustrate the work of computer networks?
3. Why are computer networks called that way? What other names can you suggest?

Task 2. Reading

Read the text about computer networks mark the statements as true (T) or false (F). Justify your answer. You have 20 minutes for this activity.

1. Computer networks allow computers to change data. ☐
2. The Internet is the best-known computer network. ☐
3. Computer networking is in the scope of computer science only. ☐
4. Every user may access the information stored on other networked computers. ☐

5. Hackers may use computer networks to spread viruses. ☐
6. Power line communications does not interfere with radio communications. ☐
7. Computer networks stimulate the development of computer hardware and software. ☐

Connecting the Planet

A **computer network** or **data network** is a telecommunications network that allows computers to exchange data. In computer networks, networked computing devices pass data to each other along data connections. The connections between nodes are established using either cable media or wireless media. The best-known computer network is the Internet.

Network computer devices that originate, route and terminate the data are called network nodes. Nodes can include hosts such as servers and personal computers, as well as networking hardware. Two devices are said to be networked when a device is able to exchange information with another device.

Computer networking may be considered a branch of electrical engineering, telecommunications, computer science, information technology or computer engineering, since it relies upon the theoretical and practical application of the related disciplines. A computer network has the following properties:

▪ Facilitates interpersonal communications.

People can communicate efficiently and easily via email, instant messaging, chat rooms, telephone, video telephone calls, and video conferencing.

▪ Allows sharing of files, data, and other types of information.

Authorized users may access information stored on other computers on the network. Providing access to information on shared storage devices is an important feature of many networks.

▪ Allows sharing of network and computing resources.

Users may access and use resources provided by devices on the network, such as printing a document on a shared network printer.

▪ May be insecure.

A computer network may be used by computer hackers to deploy computer viruses or computer worms on devices connected to the network, or to prevent these devices from accessing the network (denial of service).

▪ May interfere with other technologies.

Power line communication strongly disturbs certain forms of radio communication, e.g., amateur radio.

▪ May be difficult to set up.

A complex computer network may be difficult to set up. It may be costly to establish an effective computer network in a large organization.

Today, computer networks are the core of modern communication. Telephony increasingly runs over the Internet Protocol, although not necessarily the public Internet. The scope of communication has increased significantly in the past decade. This boom in communications would not have been possible without the progressively advancing computer network. Computer networks continue to drive computer hardware, software, and peripherals industries. The expansion of related industries is mirrored by growth in the numbers and types of people using networks, from the researcher to the home user.[19]

Task 3. Vocabulary Practice

Match the types of networking terms with their definitions. You have 5 minutes for this task.

1. Repeater	a) connects and filters traffic between two network segments
2. Hub	b) is used to connect network nodes via wire not originally designed for digital network traffic, or for wireless
3. Network bridge	c) an electronic device that receives a network signal, cleans it of unnecessary noise, and regenerates it
4. Network switch	d) an internetworking device that forwards packets between networks by processing the routing information included in the packet
5. Router	e) a repeater with multiple ports
6. Modem	f) a network device for controlling network security and access rules
7. Firewall	g) a device that forwards and filters datagrams between ports based on the addresses in the packets

Task 4. Vocabulary Practice

Read the text and fill in the gaps (1-10) with the words (a-d). You have   10 minutes to complete this task.

A computer (1) …………….. is a group of computer systems and other computing hardware devices that are (2) …………. together through communication (3) …………. to facilitate (4) ………….. and resource-shar

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[19] The text is borrowed and modified from http://en.wikipedia.org/wiki/Computer_network as of 18th January 2013.

among a wide range of (5) ………... One of the earliest (6) ………….. of a computer network was a network of communicating computers that (7) …………… as part of the U.S. military's Semi-Automatic Ground Environment. In 1969, several universities of the USA were (8) …………. as part of the Advanced Research Projects Agency Network (ARPANET) (9) ………….. It is this network that (10) …………. to become what we now call the Internet.[20]

1	a. link	b. network	c. hardware	d. station
2	a. made	b. tied	c. bound	d. linked
3	a. channels	b. holes	c. media	d. works
4	a. participation	b. dialogue	c. communication	d. interference
5	a. users	b. resources	c. actions	d. computers
6	a. cases	b. variants	c. problems	d. examples
7	a. established	b. functioned	c. made	d. acted
8	a. tied	b. united	c. connected	d. bound
9	a. work	b. case	c. project	d. topic
10	a. stopped	b. originated	c. was	d. evolved

Task 5. Language in Use

In your professional activities you will sometimes face the need to relate someone's words. These skills are necessary to report someone's orders, suggestions, refer to someone else's ideas or render the words of researches. Study the box explaining the rules of using Reported Speech. After doing so, transform the quotations of famous people into reported speech. You have 10 minutes for this task.

Reported Speech

Reported speech, unlike direct speech, is not the exact words someone used, but words which only relate the same meaning**:**
　　e.g. 'I want to set up a network,' he said. – Direct speech
　　　　He said that he wanted to set up a network. – Reported speech
If the introductory verb is in a past tense, we change verb tenses and time expresses in reported speech as follows:
　1. present simple → past simple:
　　'I want to set up a network,' he said. → He said that he wanted to
　　set up a network.

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[20] The text is borrowed and modified from http://www.techopedia.com/definition/25597/computer-network as of 20th January 2013.

2. present continuous → past continuous**:**
   'I am using a computer right now,' she said. → She said that she was using a computer at that time.
3. present perfect → past perfect:
   'I have sent an e-mail,' Tom said. → Tom said that he had sent an e-mail.
4. past simple → past simple or past perfect
   'I made a report on the topic,' Jane said. → Jane said that she made (had made) a report on the topic.
5. past continuous → past continuous or past perfect continuous
   'I was still working at six o`clock yesterday,' he said. → He said that he was (had been) still working at six o'clock the previous day.
6. Will → would
   'I will complete the task tomorrow,' she promised. → She promised to complete the task the following day.
   The verb tenses may remain the same in reported speech when reporting a general truth or laws of nature.

1. Computers are useless. They can only give you answers (Pablo Picasso).
2. I think it's fair to say that personal computers have become the most empowering tool we've ever created. They're tools of communication, they're tools of creativity, and they can be shaped by their user (Bill Gates).
3. I do not fear computers. I fear the lack of them (Isaac Asimov).
4. Personally, I rather look forward to a computer program winning the world chess championship. Humanity needs a lesson in humility (Richard Dawkins).
5. The real danger is not that computers will begin to think like men, but that men will begin to think like computers (Sydney J. Harris).
6. We're entering a new world in which data may be more important than software (Tim O'Reilly).
7. Access to computers and the Internet has become a basic need for education in our society (Kent Conrad).
8. Supercomputers will achieve one human brain capacity by 2010, and personal computers will do so by about 2020 (Ray Kurzweil).
9. People are mostly focused on defending the computers on the Internet, and there's been surprisingly little attention to defending the Internet itself as a communications medium (W. Daniel Hillis).
10. We've seen computers play chess and beat grand masters. We've seen computers drive a car across a desert. But interestingly, playing chess is easy, but having a conversation about nothing is really difficult for a computer (Hod Lipson).[21]

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[21] The text is borrowed and modified from http://www.brainyquote.com/quotes/topics/topic_computers.html as of 20th January 2014.

Differentiated Activity

Task 6. Tiered Task

Work in groups. Choose and complete any part of the task suggested below. Prepare to report your results to the class. You have 10 minutes for this task.

Group 1. Look at the following scheme[22] representing common network topologies. Explain how nodes are connected in each case to the class.
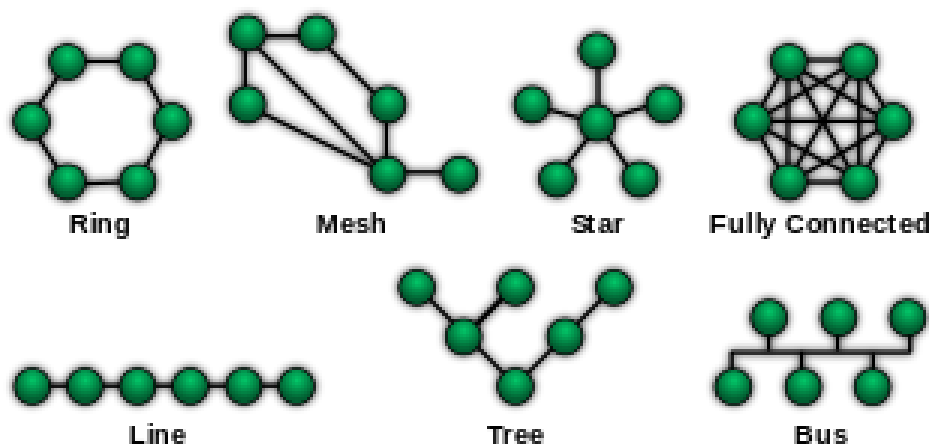
Group 2. Read the following text. Explain the differences between organizational types of network to the class. Draw a classification scheme.

An **intranet** is a set of networks that are under the control of a single administrative entity. The administrative entity limits use of the intranet to its authorized users. Most commonly, an intranet is the internal LAN of an organization. A large intranet will typically have at least one web server to provide users with organizational information.

An **extranet** is a network that is also under the administrative control of a single organization, but supports a limited connection to a specific external network. For example, an organization may provide access to some aspects of its intranet to share data with its business partners or customers. These other entities are not necessarily trusted from a security standpoint.

An **internetwork** is the connection of multiple computer networks via a common routing technology using routers. The Internet is the largest example of an internetwork. It is a global system of interconnected governmental, academic, corporate, public, and private computer networks.[23]

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[22] The picture is borrowed from http://en.wikipedia.org/wiki/Computer_network as of 20th January 2014.

[23] The text is borrowed and modified from http://en.wikipedia.org/wiki/Computer_network as of 20th January 2014.

Group 3. Read the keywords describing different types of computer networks. Rank them from the smallest to the largest. Explain the geographical types of the networks and their characteristics to the group.

Wide Area Network WAN – spans over a large physical distance; a collection of LANs through a router; collective ownership and management.

Metropolitan Area Network MAN – spans over a city; smaller than a WAN but larger than a LAN; owned and operated by single entities (government bodies, corporations).

Local Area Network LAN – connects network devices over a relatively short distance; a networked office building, home or school; group of nearby buildings; usually owned by one organisation.

Campus Area Network CAN – spans over multiple LANs; smaller than a MAN; connects universities or local business campuses.[24]

Task 7. 🔊 Listening

You are going to watch a video about computer routers. Choose any part you feel confident to complete or do them all. You have 10 minutes for the task. Use the following link to watch the video: http://www.youtube.com/watch?v=9LhkW_dkZvU

Part 1. Decide whether the following statements are true (T) or false (F). Justify your answer:

1. Router is essential device in establishing a computer network. ☐
2. Computer network consists of a number of computers. ☐
3. Transmitting between the computers is done by a scheme called Ethernet. ☐
4. There is only one type of routers. ☐
5. Wired routers transmit data using cable. ☐
6. Wireless router also needs cable to be provided with the information. ☐

Part 2. Fill in the gaps with one to three words:

Computer (1)………. is a device that you must have in order to establish a (2) ………. . A network consists of a (3) ………. of computers that are connected together to share information or work on common (4) ……….. or projects. A computer router is used to take the data that is being (5) ………… between the computers and make sure that it gets routed to the right computers. This is done by

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[24] The text is borrowed and modified from http://www.computernetworksit.com.au/blog/underestimating-support-2/ as of 20th January 2014.

a (6) ………. called (7) ……… . These days we use (8) ……………... , which allows the data to flow over a cable and go between computers.

There are (9) ………… types of routers – wired routers and (10) ………….. routers. Wired router will only transmit data if you have an (11) ………. cable. On a wireless router you could (12) …………..either a cable or just use (13) ……….. that come out of a wireless router. However, wireless routers have to be (14) ………. with the information through a (15) ………. and then they transmit it out by radio waves.

Part 3. Give definitions to the following terms according to the text:

1. Router ....
2. Network ....
3. Addressing ....
4. Wired router...
5. Wireless router...

Task 8. Pair work

Work in pairs. Read the following dialogue on setting up a network between a customer and a consultant. Turn the dialogue into reported speech. Use such introductory words as **ask, inquire, say, explain, suggest, assure, answer**. Don't forget to begin the reported question with if / whether when the direct question begins with modal or auxiliary verb. You have 10 minutes for the task.

Customer: I'm trying to set up a home network. Is there a way to do it without stringing Ethernet cable?
Consultant: Sure. You may consider setting up wireless network.
Customer: What hardware is required to build a wireless network?
Consultant: Strictly speaking, no hardware other than wireless adapters is required to build a small wireless LAN (WLAN).
Customer: How many computers can share one Wi-Fi network?
Consultant: The exact number of devices that can connect and effectively share a WiFi varies but is probably larger than you think.
Customer: Can two routers be used on the same home network?
Consultant: Installing two routers on the same home network can be useful when building a hybrid wired and wireless network or generally expanding the existing capability.
Customer: How Does Wi-Fi Use Affect Computer Battery Life?[25]

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[25] The text is borrowed and modified from http://compnetworking.about.com/od/wirelessfaqs/ as of 21ˢᵗ January 2014.

Task 9. Pair Work

Act dialogues between a customer and a consultant about setting up a network. You have time until the end of the class.

Student A. As a customer, you need to explain your needs and ask questions about setting up a network.

Student B. As a consultant, you need to suggest the most suitable network type to your customers.

Switch the roles and act the next dialogue.

Customer 1.

You need to establish a small LAN over your apartment. You have only two desktop PCs and need a low-cost option.

Customer 2.

You have a small house and need to connect your several laptops, smart phones and PC over a fast and reliable network.

Customer 3.

You are a representative of a small IT company and you need to set up a network over three-storage building with lots of computers.

Optional Activity

Task 10. Facilitated Task

Read the text about computer networks.
a) choose the correct word from the options in italics;
b) give definitions to the words in bold.

A **computer network** is a *circle / group* of computers *connected / tied* to each other electronically. This means that the computers can "talk" to each other and that every computer in the *network / web* can send information to the others. Usually, this means that the *quality / speed* of the connection is fast – faster than a normal connection to the Internet. Some basic types of computer networks *include / suggest*:

- A **local area network** (often called a LAN) connects two or more computers, and may be called a corporate network in an office or business setting.
- An "**internetwork**", sometimes called a Wide Area Network (because of the wide *distance / range* between networks) connects two or more smaller networks together. The largest internetwork is called the Internet.

Computers can be part of *one / several* different networks. Networks can also be parts of bigger networks. The local area network in a small business is usually connected to the corporate network of the larger company. Any connected machine at any level of the organization may be able to *access / get* the Internet, for example to demonstrate computers in the store, display its catalogue through a *TCP / web* server, or convert received orders into shipping instructions.[26]

Task 11. Complex Task

Read the article about famous Wi-Fi company and answer the questions to the text.
1. What was the goal of Ruckus Wireless Company back in 2004?
2. Who has been the target audience of Ruckus for the past two years?
3. Who are the main rivals of Ruckus?
4. What are competitive benefits of Ruckus?
5. What are the perspectives of Wi-Fi market?

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[26] The text is borrowed and modified from http://simple.wikipedia.org/wiki/Computer_network as of 21st January 2014.

Ruckus CEO Lo on Boosting Wi-Fi, Chasing Cisco and Going Public

Selina Lo remembers how it wasn't so long ago that Wi-Fi was trashed as an unsecure, unstable technology for connecting computers to wireless networks and the Internet. Ruckus Wireless, the Wi-Fi networking company she helped start in 2004, set out to change that, working to show that Wi-Fi could stand up to the demands of everyone from enterprise customers to broadband service providers.

For the past two years, Ruckus has turned its attention to carriers who are overwhelmed by mobile users checking email, weather and Facebook and are looking for ways to offload 3G and 4G traffic from their cellular networks. They're not the only one who see that opportunity: Cisco, with its own service provider Wi-Fi business, estimates that 36 percent of Internet traffic is being delivered over Wi-Fi today. By 2015, Wi-Fi could be responsible for 46 percent of traffic, with less than 10 percent being delivered over cellular networks. And Ericsson bought BelAir Networks for an undisclosed sum in February for its carrier-grade Wi-Fi equipment.

Ruckus is winning deals – in part because its solutions cost as little as one-third the price of rivals', says Chris DePuy, an analyst with networking market researcher the Dell'Oro Group. While Ericsson was the revenue market leader in the service provider Wi-Fi market in 2011, Ruckus has been in the lead in for the past two quarters, putting it ahead of Ericsson and Cisco. The market totaled about $150 million last year, and it's expected to double to nearly $300 million in 2012, DePuy said. And while that's just a small part of the overall enterprise Wi-Fi market – which is expected to grow to $5 billion by 2016 – DePuy says service provider Wi-Fi is one of the fastest growing segments.[27]

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[27] The text is borrowed and modified from http://www.forbes.com/sites/connieguglielmo/2012/07/12/ruckus-ceo-lo-on-boosting-wi-fi-chasing-cisco-and-going-public/ as of 21st January 2014.

Lesson 8

Whole-Class Activity

Task 12. Do or check Tasks 1-2 from your Workbook (10 minutes).

Task 13. Report the results of your Internet search. Ask each other questions related to the topic of your report (10 minutes).

Task 14. Discuss the following questions for 5 minutes. Turn to the help box if necessary:

1. What is a letter of application?
2. What is another name of a letter of application?
3. What is the purpose of a letter of application?
4. What does effective application letter do?
5. What structure does an application letter have?
6. How should an application letter be started and ended?
7. What points should be mentioned in the body of a letter?

Task 15. Letter of Application: Writing Techniques

A **letter of application**, also known as a cover letter, is a document sent with your resume to provide additional information on your skills and experience.

A letter of application typically provides detailed information on why are you are qualified for the job you are applying for. Effective application letters explain the reasons for your interest in the specific organization and identify your most relevant skills or experiences.

When writing an application letter you should include:

- Greeting
  Begin your letter greeting with "Dr./Mr./Ms. Last Name."
- Body of Letter
  ➢ Mention the job you are applying for and where you found the listing.
  ➢ Mention why your skills and experience are a good fit for the job.
  ➢ Say thank you to the hiring manager for considering you and note how you will follow up.
- Signature
  End your cover letter with your signature, handwritten, followed by your typed name.[28]

Read the article about writing a letter of application. Discuss which advice you think to be the most important. What other advice may be useful to follow when writing a letter of application? (15 minutes).

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[28] The text is borrowed and modified from http://jobsearch.about.com/od/jobsearchglossary/g/letterofapplication.htm as of 24th January 2014.

Writing Job Applications

Employers may receive hundreds of applications for a job, so it's vital to make sure that the letter or e-mail you send with your CV / résumé creates the right impression. It's your opportunity to say why you want the job and to present yourself as a candidate for the post in a way that impresses a prospective employer and makes you stand out as a prospective employee.

Before you start

You should read the advert closely so that you can tailor your application to the requirements of the job. It is also advisable to research the organization: this will show prospective employers that you really are interested in them.

Composing the letter or email

Keep your letter brief. You don't need to give a lot of detail. What you are aiming for is a clear and concise explanation of your suitability for the job.

Begin your letter or email 'Dear Mr / Mrs / Ms Name' if you know the person's name, or 'Dear Sir or Madam' if you don't know their name. If your letter starts with Sir / Madam, end it with "Yours faithfully". If you start with a person's name, end "Yours sincerely".

Avoid inappropriate language such as slang or technical jargon.

Use brief, informative sentences and short paragraphs.

Check your spelling, grammar, and punctuation carefully. Some employers routinely discard job applications that contain such mistakes.

Structure

The usual order of a job application letter or email is:

- The position applied for: refer to the title of the job in the first sentence of your letter. You should also mention where you saw the job advert or where you heard about the vacancy.
- Skills and responsibilities: pick up on the job requirements outlined in the advert and focus on any of your current skills or responsibilities that correspond to those requested.
- Your reasons for wanting the job: be clear and positive about why you want the job. Outline the qualities and skills that you believe you can bring to the job or organization.
- Closing paragraph: in the final paragraph you could say when you'd be available to start work and thank the manager for considering you as a candidate for the position.

- Signature: if you are sending a letter rather than an email, always remember to sign it and to type your name underneath your signature.[29]

Task 16. Analyse the following sample of an application letter and decide whether it is a good one. Answer the following questions. You have 10 minutes for this task.

    – What position does the author apply for?

    – Why does the author want to get this position?

    – What relevant skills for the position in question does the author have?

    – How does the author end his / her letter?

Dear Mrs Smith,

    I saw the advertisement for the position of IT system analyst on JobSearch website and would like to express my interest in such a challenging role. I am passionate about technology and its use at a systems level within businesses and organisations and wish to use my skills further in this field within a reputable company such as yours.

    You will see from my CV that I have worked as a systems analyst with DEF Company for the last three years. I specialised in reviewing the IT systems and technology capabilities in medium-sized firms, particularly in the retail sector, and now wish to use my skills in a different environment. I have significant experience of software and hardware installation and resolving compatibility issues to ensure that each client's IT systems work as efficiently as possible.

    I update my knowledge on new technology continuously and use this to provide the optimum solutions at all times. My interpersonal, organisational and planning skills are excellent and I can efficiently manage multiple deadlines.

    I would appreciate the opportunity to discuss the position in person. I would be delighted to attend for interview at your convenience.

    I look forward to hearing from you.

Yours sincerely,
John Brown[30]

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[29] The text is borrowed and modified from http://www.oxforddictionaries.com/words/writing-job-applications as of 24th January 2014.

Task 17. Look at the following paragraphs from an application letter. Put them in the correct order to restore the composition of the letter (5 minutes).

(a) My responsibilities included the development and management of the site's editorial style, the editorial calendar, and the daily content programming and production of the web site. I worked closely with health care professionals and medical editors to help them provide the best possible information to a consumer audience of patients.

(b) Dear Mr. Wilson,

(c) Experience has taught me how to build strong relationships with all departments at an organization. I have the ability to work within a team as well as cross-team. I can work with web engineers to resolve technical issues and implement technical enhancements, work with the development department to implement design and functional enhancements, and monitor site statistics and conduct search engine optimization.

(d) Joah Baker

(e) I'm writing to express my interest in the Web Content Specialist position listed on JobSearch.com. I have experience building large, consumer-focused content sites. While much of my experience has been in the business world, I understand the social value of the non-profit sector and my business experience will be an asset to your organization.

(f) I am available for an interview at any time but would appreciate two days notice. Thank you for your consideration.

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30 The text is borrowed and modified from http://icover.org.uk/cover-letter-for-an-it-systems-analyst/ as of 24th January 2014.

Differentiated Activity

Task 18. Tiered Task

Read and complete at least one part of the Task (10 minutes).

Part 1. Make up collocations using the words in bold. After doing so, make up sentences with these collocations.

Apply, gain, enclose, look, be, have, study, work

…………… for three years
………… ....a copy of a CV
………….. ..full time
……….....for the position

…………..experience in
…………..forward to meeting
………….available for the interview
…….….… the opportunity

Part 2. Look at the following sentences and find grammatical mistakes in each of them. Correct the mistakes.

1. I saw the advertisement for the post for system analyst at last week newspaper.
2. I eager to try myself in the field of information technology.
3. I specialize of expert systems and am able to create and maintain software, tailored to specific purposes.
4. I have valuable experience with development of networking systems and their support.
5. I'm currently work as a software developer at ABC Company.
6. For the last two years I am responsible for project management and support.
7. I am available for an interview on Tuesday and can be contact on Monday.
8. Look forward to hear from you.

Part 3. Read the following letter of application. What style is used in the letter? Correct stylistic mistakes and rewrite the letter.

Dear Kristen,

I saw your listing on Craigslist.com for a website designer for your tee-shirt company. I'm attaching my resume even though it doesn't list my extensive tee-shirt folding experience. 😃

Your site has some very imaginative animation/movement, especially the Sluggo! I look forward to talking with you about how I may be of help.

Lillian Black[31]

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[31] The text is borrowed and modified from http://susanireland.com/cover-letters/hiring-manager/website-designer/ as of 27th January 2014.

Task 19. Pair work

Once again, revise what paragraphs an application letter should include. Discuss in what paragraph the following common expressions / sentences may be used (10 minutes).

Paragraph 1 – Position applied for
Paragraph 2 – Skills and responsibilities
Paragraph 3 – Reasons for wanting the job
Paragraph 4 – Closing

(1)   I would like to apply for the post of ... as advertised in today's issue of ...
(2)   Although I have been studying full time, I have had a number of summer jobs which have helped me to gain experience in ...
(3)   I can be contacted on / at ...
(4)   With reference to your advertisement in ... on ...,
(5)   As you can see from my enclosed CV, I have worked in my present position ...
(6)   As requested in the advertisement, I enclose a copy of my resume together with a recent photograph.
(7)   I have gained invaluable experience in ...
(8)   I am writing to apply for the position of ...
(9)   I look forward to meeting with you to discuss my application further.
(10) I am currently a student at .... studying ...
(11) I look forward to hearing from / meeting you soon.
(12) I am due to graduate in...
(13) I feel that my ability to ... will help / enable me to ...
(14) My experience over the past two years has been at ...., where I have had responsibility for ...
(15) I am available for interview at any time and I can be contacted at / on ...
(16) I am currently working as a ....
(17) The reason for my seeking a new position is that I wish to ....
(18) For the last two years I have been working as...
(19) I believe that the experience I have gained in ... has given me the qualities you are looking for ...
(20) I am available ... and can be contacted on/at ...
(21) I will be able to bring with me my experience of ... which I believe would be useful in this position ...
(22) I would like to have the opportunity to talk to you further about my application.
(23) I believe I would be an asset to your company.
(24)   I am available for an interview at any time but would appreciate two days notice.

Task 20. Pair work

Work in pairs. Each student should choose one of the following advertisements[32] and write a letter of application for the position advertised. After doing so, exchange the letters and conduct a peer-check. You have time until the end of the class.

Website Administrator / Online Content Writer

We are looking for a Website Administrator / Online Content Writer to join an innovative start-up online property auction business based in Newbury on a three month contract.

Multi-Skilled Developer

This is a fantastic opportunity for creating and supporting applications that form our web site and intranet. You'll work closely with internal customers and project teams, business partners and third-party suppliers.

Database Executive

A Stratford based charity is looking for an interim Database Executive for a 3 month role. The job will involve providing technical database support to deal with a backlog of data and system management tasks.

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[32] The texts are borrowed and modified from http://jobs.theguardian.com/jobs/it/2/as of 27th January 2014.

Optional Activity

Task 21. Facilitated Task

Read the following letter of application for the position of a Senior Programmer Analyst. Fill in the gaps with the words from the box:

experience	speaking	analysis	development	opportunity
candidate	understanding	interest	reached	things
documentation	applications	testing	service	include

Dear Hiring Manager,

This letter is to express my (1) ………… in discussing the Senior Programmer Analyst position posted on the Company website. The (2) …………… presented in this listing is very appealing, and I believe that my strong technical (3) …………. and education will make me a very competitive (4) ………….. for this position.

The key strengths that I possess for success in this position (5) …………., but are not limited to, the following:

- I have successfully designed, developed, and supported live use (6) ……..
- Eager to learn new (7) ………… .
- Strive for continued excellence.
- Provide exceptional contributions to customer (8) …….. for all customers.

With a MS degree in Information Systems Management I have a full (9) …….. of the full life cycle of a software (10) …………. project. I also have experience in learning and excelling at new technologies as needed. My experience includes:

- Customer service and support
- Programming both new applications and maintenance work
- Problem isolation and (11) ………….
- Software quality (12) …………….
- Application and requirement analysis
- Process improvement and (13) …………..

Please see my resume for additional information on my experience.

I can be (14) …………. anytime via my cell phone, 555-555-5555 or via email at name@gmail.com. Thank you for your time and consideration. I look forward to (15) …………. with you about this employment opportunity.

Sincerely,
Benjamin Johnson[33]

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[33] The texts are borrowed and modified from http://jobsearch.about.com/od/coverlettersamples/a/sampletech.html as of 27th January 2014.

Task 22. Complex Task

Write a letter of application for the position you dream of. Include relevant experiences and skills you possess to be suitable for the post. Your letter should have the following structure:

Paragraph 1 – Greeting.
Paragraph 2 – Position applied for.
Paragraph 2 – Your skills and responsibilities.
Paragraph 3 – Reasons for wanting the job.
Paragraph 4 – Closing.

Unit 5. The Internet

Lesson 9

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about the Internet. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. What is the Internet?
2. When and where was the Internet created?
3. How has the society benefited from use of the Internet technologies?

Analytical Concern

1. How has the Internet changed over the last decade?
2. What activities has the Internet reshaped or replaced?
3. What is the future of the Internet?

Practical Concern

1. What do you usually use the Internet for?
2. What is your favourite site?
3. What professions are closely connected with the use of the Internet?

Creative Concern

1. How can the Internet be used in entertainment?
2. How can the Internet be used to promote art?
3. How has the Internet changed modern art?

Task 2. Reading

Read the text about the Internet and the World Wide Web. Explain the meaning of the key words / phrases in bold. You have 20 minutes for this activity.

The Internet and The Web

The Internet is a global system of interconnected **computer networks** that use the standard Internet protocol suite (TCP / IP) to serve several billion users worldwide. It is a network of networks that consists of millions of private, public, academic, business, and government networks, of local to global scope, that are **linked** by a broad array of electronic, wireless, and optical networking

technologies. The Internet carries an extensive range of information resources and services, such as the inter-linked **hypertext** documents of the World Wide Web (WWW), the infrastructure to support email, and peer-to-peer networks.

Most traditional communications media including telephone, music, film, and television are being reshaped or redefined by the Internet, giving birth to new services such as voice over Internet Protocol (**VoIP**) and Internet Protocol television (**IPTV**). Newspaper, book, and other print publishing are adapting to website technology, or are reshaped into blogging and web feeds. The Internet has enabled and accelerated new forms of human interactions through instant messaging, Internet forums, and social networking. Online shopping has boomed both for major retail outlets and small traders.

Though the Internet has been widely used by academia since the 1980s, the commercialization of what was by the 1990s an international network resulted in its popularization and incorporation into virtually every aspect of modern human life. In 2012, more than 2.4 billion people – over a third of the world's human population – have used the services of the Internet; approximately 100 times more people than were using it in 1995.

Many people use the terms Internet and **World Wide Web**, or just the Web, interchangeably, but the two terms are not synonymous. The World Wide Web is only one of hundreds of services used on the Internet. The Web is a global set of documents, images and other resources, logically interrelated by hyperlinks and referenced with Uniform Resource Identifiers (URIs). URIs symbolically identify services, servers, and other databases, and the documents and resources that they can provide. Hypertext Transfer Protocol (**HTTP**) is the main access protocol of the World Wide Web.

World Wide Web **browser** software, such as Microsoft's Internet Explorer, Mozilla Firefox, Opera, Apple's Safari, and Google Chrome, lets users **navigate** from one web page to another via hyperlinks embedded in the documents. These documents may also contain any combination of computer data, including graphics, sounds, text, video, multimedia and interactive content that runs while the user is interacting with the page.

Through keyword-driven Internet research using **search engines** like Yahoo! and Google, users worldwide have easy, instant access to a vast and diverse amount of online information. Compared to printed media, books,

encyclopaedias and traditional libraries, the World Wide Web has enabled the decentralization of information on a large scale.[34]

Task 3. Vocabulary Practice

Match the words (1-7) with their definitions (a-g). You have 5 minutes for this task.

1. Internet	a) a software application for retrieving, presenting and traversing information resources on the Web
2. WWW	b) application protocol for distributed, collaborative, hypermedia information systems
3. VoIP	c) global system of interconnected computer networks
4. HTTP	d) a software system that is designed to search for information on the World Wide Web
5. Browser	e) a reference to data that the reader can directly follow by clicking or that is followed automatically
6. Search engine	f) a global set of documents, images and other resources, logically interrelated by hyperlinks
7. Hyperlink	g) group of technologies for the delivery of voice communications and multimedia sessions over Internet Protocol

Task 4. Vocabulary Practice

Read the text and fill in the gaps with the words from the list. You have 10 minutes to complete this task.

connects	public	networks	digital	transform
interconnect	sales	accessible	chat	capability
applications	revolutionized	purpose	emerged	transmission

Internet, a system architecture that has (1) ……………….. communications and methods of commerce by allowing various computer (2) …………. around the world to (3) …………. . Sometimes referred to as a "network of networks," the Internet (4) …………. in the United States in the 1970s but did not become visible to the general (5) ……… until the early 1990s. The Internet provides a (6) ……….so powerful and general that it can be used for almost any (7) ……….. that depends on information, and it is (8)………. by every individual who (9) ………. to one of its constituent networks.

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[34] The text is borrowed and modified from http://en.wikipedia.org/wiki/Internet as of 27th January 2014.

It supports human communication via electronic mail (e-mail), "(10) …….
rooms," newsgroups, and audio and video (11) …………. and allows people to
work collaboratively at many different locations. It supports access to (12) …….
information by many (13) …………., including the World Wide Web. The Internet
has proved to be a ground for a large and growing number of "e-businesses" that
carry out most of their (14) ……….. and services over the Internet. Many experts
believe that the Internet will dramatically (15) ……….. business as well as
society.[35]

Task 5. Language in Use

The ability to ask proper questions is closely connected with the
ability to receive important information. That`s why making questions is
very important in every sphere of human life including professional
activities. Study the box explaining the ways of making questions. Then
read the extracts about the Internet and ask as many questions as you can
(10 minutes).

Making Questions

1. To form simple questions, which are followed by yes/no answers, we
   put an auxiliary or modal verb before the subject of the sentence.
   Note, that auxiliary verb corresponds to the tense of the main verb in
   the sentence:
   e.g. Do you use the Internet for study? – Yes, I do.
        Have you visited this site? – No, I have not.
        Did you find the information? – Yes, I did.

2. We start Wh- questions with a question word (e.g. what, where,
   when etc.). We also put auxiliary or modal verb before the subject:
   e.g. When did you open your site? – A month ago.
        How often do you visit this site? – I visit it very day.
   Note that if we use the words **who, what, which, whose** to ask
   about the **subject** of the sentence, the verb remains in the
   affirmative form:
   e.g. Who created this website? (NOT: ~~Who did create~~...)
        Which costs more – Wi-Fi or Ethernet network?

3. We may use question tags if we want to confirm something.
   Question tags are formed with the auxiliary/modal verb of the main
   sentence and the appropriate pronoun. A positive statement is
   followed by a negative question tag and vice versa:
   e.g. This is a good site, isn't it?
        You have used the Internet, haven't you?
        You don't have Wi-Fi, have you?

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[35] The text is borrowed and modified from http://www.britannica.com/EBchecked/topic/291494/Internet as of 27th January 2014.

The Internet is a global network connecting millions of computers. More than 100 countries are linked into exchanges of data, news and opinions. According to Internet World Stats, as of December 31, 2011 there was an estimated 2,267,233,742 Internet users worldwide. This represents 32.7 % of the world's population.

There are a variety of ways to access the Internet. Most online services offer access to some Internet services. It is also possible to gain access through a commercial Internet Service Provider (ISP).[36]

Differentiated Activity

Task 6. 🔊 Listening

You are going to watch a video about the influence of the Internet on English language. Choose whatever part you feel confident to complete or do them all. You have 10 minutes for the task. To watch the video, use the following link: http://www.youtube.com/watch?v=OPltpdu9KGM

Part 1. Decipher the following abbreviations. What other abbreviations are often used on the Internet in English and in your native language?

1. IMHO ……………………………………………………………………..
2. BTW……………………………………………………………………….
3. LOL ………………………………………………………………………
4. UG2BK …………………………………………………………………...

Part 2. Fill in the gaps:

In 1972, the first (1)........ was sent. Soon, the Internet (2) .... , a free global space to (3).......... information, ideas and amusing pictures of cats. Before the Internet, English (4) .... through people speaking it, but the *Net* brought (5) .... back into (6) .... and hundreds of cases of repetitive strain injury. Nobody had ever had to (7) .... anything before, let alone use a (8).............. , and the only time someone set up a (9) ...., it ended with a massive insurance claim and a huge pile of charred (10) .... Conversations were getting (11) .... than the average attention span. Why bother (12) .... a sentence when an (13) ....would do and leave you more time? Some changes even passed into (14) .... English.

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[36] The text is borrowed and modified from http://www.webopedia.com/TERM/I/Internet.html as of 29th January 2014.

Part 3. In your own words, explain the meaning of the following words / phrases which are connected with computers and the Internet. Tell if they have different meaning in other spheres of use.

The Net, download, toolbar, firewall, wallpaper, blog, hard drive, fail.

Task 7. Group activity

You are going to be divided into several groups with a special task for each group. Be ready to report the results of your work to the class. You have 10 minutes for this task.

Group 1. Comment on the following charts. Explain how they correlate with each other.
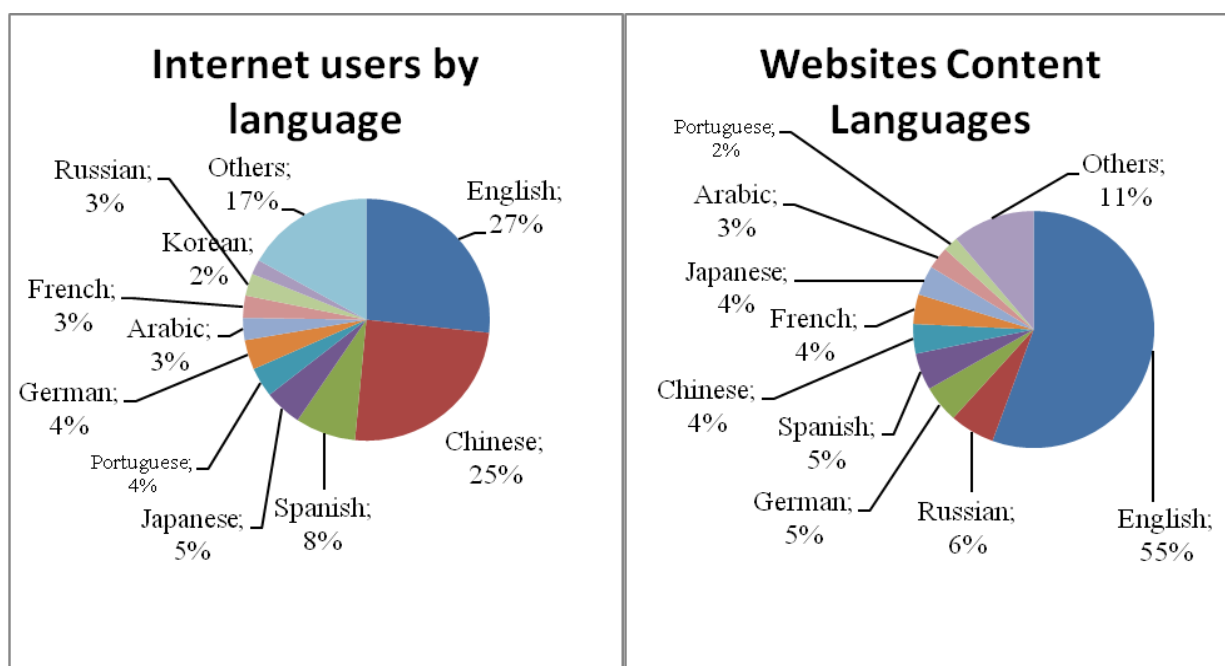
Group 2. Inside your group, analyse how the Internet has changed the following spheres of human life:

- ➤ Business
- ➤ Agriculture
- ➤ Cinema
- ➤ Literature
- ➤ Education
- ➤ Industry

Group 3. Inside your group, discuss how the Internet can be used in everyday life. Classify the main ways of its use into the types.

Task 8. Pair work

Using the help box from Task 5, ask each other questions on one of the following topics:

> *The use of the Internet;*
> *Your favourite website;*
> *Internet and job.*

Task 9. Team Work

In teams, think of the ways people of the professions depicted can use the Internet during their work. Make a list of your ideas. The team which suggests the largest number of ideas wins.

A   B   C

Optional Activity

Task 10. Facilitated Task

a) read the text and try to explain the meaning of the words in bold;
b) make up sentences with these words.

The Internet is a global system of **interconnected** computer networks. The Internet is used to send information quickly between computers around the world. It has millions of smaller **domestic**, academic, business, and government networks and websites, which together carry many different kinds of information (facts and details) and services. So in other words, the Internet is a **network** of networks.

The Internet is used for many things, such as **electronic mail**, online chat, file transfer, and the interlinked web pages and other documents of the World Wide Web.

The most used service on the Internet is the **World Wide Web** (which is also called the "Web"). The Web contains websites, **blogs**, and also wikis like Wikipedia. Webpages on the Web can be seen and read by anyone (unless the page needs a password, or it is blocked).

The second major use of the Internet is to send and receive e-mail. E-mail is private and goes from one user to another. **Instant messaging** (such as AIM or ICQ) is similar to email, but allows two or more people to **chat** to each other much faster.[37]

Task 11. Complex Task

Read an article from "The Economist" magazine about the Internet of things. Explain the meaning of the phrases in bold.

Formulate the problem which the article deals with. Which conclusion does the author draw?

Spam in the fridge: When the internet of things misbehaves

"The internet of things" is **one of the buzziest bits of jargon** around in consumer electronics. The idea is to put computers in all kinds of products – televisions, washing machines, thermostats, refrigerators – that have not, traditionally, been computerised, and then connect those products to the internet.
If you are in marketing, this is a great idea. Being able to browse the internet from your television, switch on your washing machine from the office or have your fridge e-mail you to say that you are running out of orange juice is a good way to

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[37] The text is borrowed and modified from http://simple.wikipedia.org/wiki/Internet as of 29th January 2014.

sell more televisions, washing machines and fridges. If you are a computer-security researcher, though, it is a little worrying. For, as owners of desktop computers are all too aware, **the internet is a two-way street**. Once a device is online, people other than its owners may be able to connect to it and persuade it to do their bidding.

Proofpoint, a computer-security company, said it had seen exactly that happening. It reported the existence of **a group of compromised computers** which was at least partly comprised of smart devices, including home routers, burglar alarms, webcams and a refrigerator. The devices were being used to send spam and "phishing" e-mails, which contain malware that tries to steal useful information such as passwords.

Many of the computers identified by Proofpoint seem to have been hacked by trying the factory-set usernames and passwords that buyers are supposed to change. (Most never bother.) The computers in smart devices are based on a small selection of cheap **off-the-shelf hardware** and usually run standard software. This means that compromising one is likely to compromise many others at the same time. And smart devices lack many of the protections available to desktop computers, which can run antivirus programs and which receive regular security updates from software-makers.

Ross Anderson, a computer-security researcher at Cambridge University, has been worrying about the risks of smart devices for years. Spam e-mails are bad enough, but worse is possible. Smart devices are **full-fledged computers**. That means there is no reason why they could not do everything a compromised desktop can be persuaded to do- for example, hold websites hostage by flooding them with useless data. And it is possible **to dream up even more serious security threats**. "What happens if someone writes some malware that takes over air conditioners, and then turns them on and off remotely?" says Dr Anderson. "You could bring down a power grid if you wanted to."

That may sound paranoid, but in computer security **today's paranoia is often tomorrow's reality**. For now, says Dr Anderson, the economics of the smart-device business mean that few sellers are taking security seriously. Proper security costs money, after all, and makes it harder to get products promptly to market. He would like legislation compelling sellers to ensure that any device which can be connected to the internet is secure. That would **place liability for hacks squarely on the sellers' shoulders.** For now, he has had no luck. But Proofpoint's discovery seems unlikely to be a one-off.[38]

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[38] The text is borrowed and modified from http://www.economist.com/news/science-and-technology/21594955-when-internet-things-misbehaves-spam-fridge as of 29th January 2014.

Lesson 10

Whole-Class Activity

Task 12. Do or check Tasks 1-2 in your Workbooks (10 minutes).

Task 13. Work in pairs. Be ready to report the results of your Internet search. Ask each other questions about interesting Internet websites (10 minutes).

Task 14. Discuss the following questions for 5 minutes. Turn to the help box if necessary:

1. What is a memo?
2. What is the origin of the word "memo"?
3. What structure does a memo have?
4. What does a memo have in common with a common letter?
5. What is the difference between a letter and a memo?
6. What are the features of a good memo?
7. Where are memos typically used?

A **memorandum** (abbrev.: **memo**) originates from the Latin verbal phrase *memorandum est*, which means "It must be remembered (that)...". It is therefore a note, document or other communication that helps the memory by recording events or observations on a topic, such as may be used in a business office.

A memorandum can have only a certain number of formats; it may have a format specific to an office or institution.

Memos typically have the following structure:

- **Date** – the month, day, and year of writing
- **To** – the name of the reader
- **From** – the name of the sender
- **Subject** – the topic and focus of writing
- **Body** – which typically includes introduction, main body and conclusion

Task 15. Look at the following example of an internal memo.[39] Discuss its structure and answer the questions. You have 5 minutes for this task.

- What structure does the memo have?
- What is the topic of the memo?
- Who is the memo intended for?
- What does the letter inform about?
- What feedback is expected from the reader(s)?

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[39] The text is borrowed and modified from http://www.web-books.com/eLibrary/NC/B0/B67/26MB67.html as of 30th January 2014.

To:Jason Sedgewick
From:Abe Forte
RE:March 12 Sales Meeting

The quarterly sales meeting will be held on March 12 at the Radisson City Center. You are cordially invited to participate in the interactive planning session at 10:00 a.m. Your insights will be extremely valuable as the sales team frames the plan for the next year.

Please confirm your attendance by Friday by calling me at 223x233x4 or by e-mailing me at aforte@gtb.com.

Thanks in advance for your participation.

CC: Alen Adamonth, Justin Kovalsky

Task 16. Memo: Writing Techniques

Read the text about writing memos. Put the headings (A-G) into the gaps (1-7). You have 15 minutes for this task**.**

- A. Consider who the audience should be.
- B. Suggest ways to address the issue in the summary segment.
- C. Close the memo with a friendly ending that restates what actions you want the reader to take.
- D. Write the heading segment.
- E. Review and edit your memo to make sure that it is clear, concise, persuasive, and free of errors.
- F. Introduce the problem or issue to your readers in the opening segment.
- G. Support your course of action in the discussion segment.

Successful Memo Writing

(1) _____

Specify who the memo is for and who sent it. The heading segment should also include the complete and exact date the memo was written, and the subject matter (what the memo is about).

(2) _____

In order to get people to read and respond to the memo, it's important to tailor the tone, length, and level of formality of the memo to the audience who will be reading it. Doing this effectively requires that you have a good idea of who the memo is intended for.

(3) _____

Briefly give them the context behind the action you wish them to take. This is somewhat like a thesis statement, which introduces the topic and states why it matters. Include only as much information as is needed, while still being convincing that a real problem exists. As a general guideline, the opening should take up about ¼ of the total length of the memo.

(4) _____

What you are summarizing here are the key actions you would like your readers to take. This can also include some evidence to back up your recommendations.

(5) _____

Be persuasive. State how the readers will benefit from taking the action you recommend, or be disadvantaged through lack of action.

- Give evidence and logical reasons for the solutions you propose.
- Start with the most important information, then move to specific or supporting facts.
- The general guideline for length is that the summary and discussion segments combined should comprise about ½ of the memo.

(6) _____

You might want to include a statement like, "I will be glad to discuss these recommendations with you later on and follow through on any decisions you make." This should generally take about ⅛ of the total length of the memo.

(7) _____

Check that you are consistent in the type of language that you use, and eliminate unnecessary scholarly words or technical jargon.

- Review for spelling, grammar, and content errors. Pay particular attention to names, dates, or numbers.
- Check that it is not excessively long, and cut out any extraneous material.[40]

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[40] The text is borrowed and modified from http://www.wikihow.com/Write-a-Memo as of 30th January 2014.

Task 17. Read the following memo. Some words have been removed from the text. Fill in the words in the gaps to restore the original memo (5 minutes).

(1) _____: Michael Marsh, Store Manager

(2) _____: Daniel Lipton, Assistant Manager

(3) _____: June 18, 2010

(4) _____: Dress Code Issues

A number of our clients have expressed their concern over the way certain sales associates are dressed. (5) _____complain their clothing does not reflect our store's good image and quality of service, and instead makes them look trashy and unprofessional. (6) _____it is necessary for us to establish and enforce a dress code for all our store (7) _____. Some of the items that can no longer be considered appropriate are excessively baggy pants and T-shirts, low cut blouses, and any garment that exposes the chest and back.

(8) _____to discuss this issue with you at your convenience, and also answer any questions you may have. (9) _____contact me at XXX-XXXX.[41]

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[41] The text is borrowed and modified from http://www.epcc.edu/tutorialservices/valleverde/Documents/Write_a_Memo.pdf as of 30th January 2014.

Differentiated Activity

Task 18. Tiered Task

You are going to watch a video (3 min) which gives advice on how to write a memo. After watching the video, complete any part of the task or do them all. You have 5 minutes for this activity. Use the following link to watch the video: http://video.about.com/esl/Learn-ESL--Tips-for-Writing-a-Business-Memo.htm

Part 1. Fill in the missing information.

"Memo" is a short form of the word "memorandum." Generally speaking, a memo is an inter-office or internal written communication for a (1) …………………. It is prepared by a (2) …………………… .

Before writing a business memo you need analyse two questions:

What is the (3) ………………of the business memo that I plan to write?

Who is the (4) ……………….?

Keep in mind that a memo is not a (5) …………… nor does it follow its format. Rather, it needs to be written in (6) ………….., succinct sentences so that the points you need to make are made (7) …………….. .

Part 2. Explain the difference between a letter and a memo as stated in the video.

Memo is not a business letter, nor ……………………………………………………
Rather, …………………………………………………………………………..
As a memo is not a letter,……………………………………………………………

Part 3. In your own words, retell what should be written in the heading, the main body and the closing of the memo.

Task 19. Tiered Task

Read the following memos and complete at least one part of the task. You have 10 minutes for this task.

Part 1. Read the following memo. Choose the correct option from the words in bold.

To: Users of Athena Network
From: MBN Information Systems
(1) **Date / Time**: January 31, 2014
(2) **Subject / Topic**: Shorter URLS on WEB.MIT.EDU

MBN Information Systems has come up with a scheme for shorter URLs for files (3) **saved / stored** on the Athena network and accessed through the WEB (4) **file / server**, web.mbn.edu. (5) **Since / Because** electronic publishers at MBN can now (6) **make/use** and publicize shorter URLs for their documents, addresses will be   (7) **easier / easy** to (8) **reference / link** and remember.

Please, (9) **ask / note** that from now on, Technology Review (10) **home / house** page can be (11) **clicked / accessed** through http://web.mbn.edu/techreview.
If you have any questions, (12) **find / contact** us through http://web.mbn.edu/help.[42]

Part 2. Fill in the gaps with the words from the unit.

(1) _____: Heads of Departments and Agencies
(2) _____: Tom Jackson, Deputy Director for Management
(3) _____: January 31, 2014
(4) _____: Protection of Sensitive Agency Information

In an effort to properly safeguard our (5) _____assets while using information technology, it is (6) _____ for all departments to know their baseline of activities.
I am (7) _____ all departments and agencies to (8) _____ the following actions:
1. Encrypt all data on mobile computer / devices which carry agency data.
2. Allow remote access only with two-factor authentication.
3. Log all computer-readable data extracts from databases and verify each extract has been erased within 90days.
Most (9) _____ and agencies have these (10) _____ already in place. Please (11) _____ these safeguards have been reviewed and are in place (12) _____ the next 45 days.[43]

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[42] The text is borrowed and modified from http://www.mhhe.com/mayfieldpub/tsw/l-tech.htm as of 31st January 2014.

[43] The text is borrowed and modified from http://www.docstoc.com/docs/2222489/memo-examples as of 31st January 2014.

Part 3. Look through the following memo. Find and correct any mistakes in the lines. Put a tick (V) if there are no mistakes. The first line has been done for you.

To: All employees
From: John McWane, CEO of ABC Company
Subject: Responsible Use of Electronic Communications

Electronic mail provide an immediate and convenient means of communication. A single message can program to send to any number of persons, at any time of the day. Nevertheless, before we send the letter, we should consider what our intended messages may end up.	1 provide**s** 2 _____ 3 _____ 4 _____
The negative repercussion of unintentional distribution is illustrated recently when an office employee sended one of our internal reports to a number of our clients. This story shows a lack of discretion from the part of the writer, what didn't consider the sensitive nature of the message. We should learn from this mistake.	5 _____ 6 _____ 7 _____ 8 _____ 9 _____
We should remember that companys e-mails belong to official correspondence. They reflect your professionalism and present an image of ABC Company. Let make certain that image is positive one.[44]	10 _____ 11 _____ 12 _____

Task 20. Pair Work

Each student should choose one of the following topics and write a memo. Peer-check your memos after you complete the task and show your memos to the teacher. You have time until the end of the class.

Student A. You are a CEO of a large international VMS Company. Write a memo to the heads of departments in which you inform them about an upcoming annual meeting. The meeting is to take place on March 17, at 10 a.m.

Student B. You are a Human Resources Manager at VMS Company. Write a memo to the employees of your company, in which you inform them about new dress code rules. Stress the importance of proper image of your company.

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[44] The text is borrowed and modified from http://www.airforcewriter.com/officialmemorandum.htm as of 6th January 2014.

Optional Activity

Task 21. Facilitated Task

Look through the following memo.[45] Some sentences have been removed from their places. Match the gaps (1–5) with the sentences (A-E) to complete the memo.

To: Heather Jones, Chairman, From: Wilson Gayle, Community Development Department Date: January 12, 2012 Subject: (1) .... (2).. The agenda of the meeting is to discuss the comprehensive solutions provided by the experts and management to grow the company in this competitive market. (3)... We also like to request you all to present their plans and ideas on the company and team's growth. (4) .... The management is also attaching all the information and details related to the meeting along with this memo. (5)..	A. This to inform all the project heads and team leaders that management has decided to conduct a meeting on 15.01.2012. B. The administration is also requesting all the project managers to provide a report on the production and services offered by the team on the last month. C. Meeting for the Comprehensive Plans of Company's Growth. D. For any doubts or queries, contact us within two working days. E. Therefore, we request you all to attend the meeting without any fail.

Task 22. Complex Task

Read the memo and answer the following questions.
1. What is the subject of the memo? Does it fully reflect the main idea of the memo?
2. What kind of changes will the organization undergo?
3. Who initiates the changes? Who participated in the development of the new structure?
4. How will the reorganization influence employees?
5. What further actions will be undertaken?

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[45] The text is borrowed and modified from http://www.foundletters.com/search/sample-memo-letter-to-attend-meeting as of 1st February 2014.

To: Mayor and Council

From: Liam Bake, City Manager

Subject: Reorganization

Since joining the organization, I have made several observations regarding the effectiveness of our current organizational structure. As you know, this structure has been in place for the past decade, yet during this same period of time, the needs of our community have changed, requiring a higher standard of service and responsiveness. With this in mind, staff has been developing a City organizational structure designed to increase accountability, more evenly distribute workload, and foster collaboration. The combination of these enhancements will ultimately provide improved service to our residents.

One change involves better distribution of responsibilities within the City Manager's Office. I am proposing a new Deputy City Manager position for oversight of internal services, which will allow the Assistant City Manager to focus on external service departments, day-to-day operations of the organization and special projects.

Another significant change is the creation of a new Assets Management Department, which will be responsible for maintenance of all City assets and open spaces as well as custodial services. These functions are now provided in varying degrees by four different departments. This centralized approach will capitalize on existing resources and provide a consistent standard of care across our facilities and open spaces. Changes will occur in other departments to improve our service.

Additional information is provided in the attached document. The specifics of work unit or division reassignments is still to be determined. A steering committee, to be convened soon, will meet with the affected groups to refine the proposed structure and recommend an implementation plan by February. It is anticipated that key components of the plan will be incorporated into next year's budget; others may be phased in over a longer period of time. To the degree possible, I have asked that the changes be cost-neutral and make the best use of existing resources.

This reorganization is not meant to diminish the work currently being performed by our work forces, nor devalue those efforts. Neither is it intended that any employee will lose his or her job because of this restructuring plan. Employees will have an opportunity to provide input and information to the steering committee and the City Manager's Office throughout this process, and a system to monitor and measure these changes will also be developed and put into place.

I will keep you abreast of these changes as we work out the details and develop our implementation plan and timeline.[46]

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[46] The text is borrowed and modified from http://www.smgov.net/departments/council/agendas/2007/20070106/s2007010604-2-1.pdf as 1st February 2014.

MODULE 2 TEST. NETWORKING SYSTEMS

1. A telecommunications network that allows computers to exchange data.

a) data network   b) telecom   c) data connection   d) network node

2. Network computer devices that originate, route and terminate the data.

a) personal computer   b) server   c) network node   d) networking hardware

3. What does a network node not include?

a) hosts   b) networking hardware   c) software   d) personal computer

4. A computer network may be used by computer hackers to ……….. computer viruses or computer worms.

a) deploy   b) prevent   c) deny   d) access

5. Power line communication strongly …………. certain forms of radio communication.

a) Interferes   b) disturbs   c) prevents   d) amplifies

6. An electronic device that receives a network signal, cleans it of unnecessary noise, and regenerates it.

a) hub   b) router   c) modem   d) repeater

7. A repeater with multiple ports.

a) modem   b) bridge   c) switch   e) hub

8. …………. connects and filters traffic between two network segments.

a) hub   b) network bridge   c) firewall   e) repeater

9. A device that forwards and filters datagrams between ports based on the addresses in the packets.

a) network switch   b) modem   c) firewall   d) hub

10. An internetworking device that forwards packets between networks by processing the routing information included in the packet.

a) Hub   b) modem   c) router   d) repeater

11. ……………. is used to connect network nodes via wire not originally designed for digital network traffic, or for wireless.

a) modem   b) router   c) hub   d) bridge

12. A network device for controlling network security and access rules.

a) firewall   b) hub   c) router   d) antivirus

13. A set of networks that are under the control of a single administrative entity.

a) Iternet   b) intranet   c) link   d) extranet

14. A network that is under the administrative control of a single organization, but supports a limited connection to a specific external network

a) LAN　　　　b) intranet　　　　c) extranet　　　　d) internetwork

15. The connection of multiple computer networks via a common routing technology using routers.

a) Extranet　　　　b) intranet　　　　c) LAN　　　　d) internetwork

16. What is the largest example of an internetwork?

a) LAN　　　　b) extranet　　　　c) the Internet　　　d) hotspot

17. A network that spans over a large physical distance.

a) WAN　　　　b) MAN　　　　c) CAN　　　　d) LAN

18. A type of a network that connects universities or local business campuses.

a) MAN　　　　b) WAN　　　　c) CAN　　　　d) BAN

19. A network that spans over city.

a) WAN　　　　b) MAN　　　　c) CAN　　　　d) LAN

20. A software application for retrieving, presenting and traversing information resources on the Web.

a) Hyperlink　　b) HTTP　　　　c) browser　　　d) search engine

21. A global system of interconnected computer networks.

a) The Internet　b) WWW　　　　c) VoIP　　　　d) HTTP

22. A group of technologies for the delivery of voice communications and multimedia sessions over Internet Protocol

a) VoIP　　　　b) HTTP　　　　c) IPTV　　　　d) TCP/IP

23. A reference to data that the reader can directly follow by clicking or that is followed automatically.

a) HTTP　　　　b) search engine　　c) hyperlink　　d) browser

24. Application protocol for distributed, collaborative, hypermedia information systems.

a) VoIP　　　　b) TCP/IP　　　　c) HTTP　　　　d) WWW

25. A software system that is designed to search for information on the World Wide Web.

a) browser　　　b) search engine　　c) hyperlink　　d) HTTP

MODULE 3. ECONOMICAL SYSTEMS

At the end of this module Students will know:

➢ the notions of business and enterprise, banking, market and competition;
➢ the types of businesses and enterprise structure;
➢ the types of banks, banking operations and accounts;
➢ the types of market structure, the notions of supply and demand.
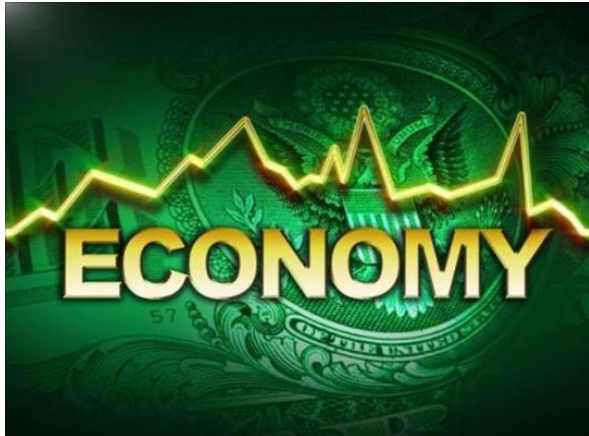
At the end of this module Students will understand:

➢ the difference between types of business ownership;
➢ the ways banks earn profit and conduct operations;
➢ the forces which act at a marketplace.

At the end of this module Students will be able to:

➢ express different activities connected with business and banking operations;
➢ give reasons for making decisions;
➢ use modal verbs in professional spheres of communication;
➢ write a business letter, an e-mail and a report.

Unit 6. Business and Enterprise

Lesson 11

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about enterprises and business. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. What company would you like to work for – a large corporation or small family business? Why?
2. What are the benefits of running your own business?
3. Would you like to be a freelancer or an employer with fixed salary? Why?

Practical Concern

1. What is the most important industry of your country?
2. What are the cons of being a sole proprietor?
3. What skills are needed to become a businessman?

Analytical Concern

1. What are the pros and cons of being a freelancer?
2. What aspects should be analysed before setting up your business?
3. What are the most dangerous risks of running your own business?

Creative Concern

1. If you had a company, what would it produce?
2. What creative industries do you know?
3. What is the best business advertisement that you have seen?

Task 2. Reading

Read the text about enterprise and mark the statements as true (T) or false (F). Justify your answer. You have 20 minutes for this activity.

1. A business', 'an enterprise' and 'a firm' are synonyms. ☐
2. The word 'business' has only one meaning. ☐
3. A sole proprietorship is owned by a group of people. ☐
4. Limited Liability Company protects its owner from financial claims. ☐
5. Corporation is a large organization with shareholders. ☐

Business and its Types

A **business**, also known as an **enterprise** or a **firm**, is an organization involved in the trade of goods, services, or both to **consumers** or to other businesses. Businesses are prevalent in capitalist economies, where most of them are **privately owned** and provide goods and services to customers for profit. Businesses may also be **not-for-profit** or **state-owned**. A business owned by multiple individuals may be also referred to as a company.

The etymology of "business" stems from the state of being busy, doing commercially profitable work. The term "business" has at least three usages, depending on the scope in which it is used. In the singular usage business means a particular organization; a more generalized usage refers to a particular market sector, e.g. "the music business". Compound forms such as "agribusiness" represent the word's broadest meaning and mean all activity by all **suppliers** of **goods and services**. There are three common types of business ownership:

Type One: Sole Proprietor

A sole proprietor is simply a business owned and managed by a single person, where there is no legal difference between the individual and the business – even though you could use a trade name other than your own name for the business. In a sole proprietorship you receive all the **profits** and have all responsibility for losses and **debts**. For practical purposes this means that your business's profits or losses are passed through to your personal income **tax** form and taxed accordingly.

If there are more than one of you sharing ownership and management of the business, then you would be a general partnership – which is similar to a sole proprietorship. It just describes a business with multiple owners rather than just one and essentially has the same pros and cons as the sole proprietorship.

Type Two: Limited Liability Company (LLC)

A LLC is not a corporation, just a form of company that provides **liability** protection for its owners. It handles the financial side of things the same as a sole proprietorship or partnership would (in terms of how it deals with taxes), but, as the name suggests, it's intended to provide limited liability protection from legal and financial claims.

Type Three: Corporation

Simply put, a corporation is a **legal entity** that is separate from its owners, employees and **shareholders**. It means that when you incorporate you create a wholly

new legal personality that takes on the burden of liability and financial responsibility for the business instead of you. When we think of corporations we often think of large organizations. They don't have to be, but most corporations do have shareholders, and **boards of directors**, and rules of governance and reporting – and hence a lot of reporting requirements.[47]

Task 3. Vocabulary Practice

Match the types of businesses (1-9) with their functions (a-i). You have 5 minutes for this task.

1. Agriculture and mining businesses	a) generate profits primarily from the sale of intellectual property and include movie studios, publishers and internet and software companies
2. Financial businesses	b) produce public services such as electricity or sewage treatment, usually under a government charter
3. Information businesses	c) offer intangible goods or services and typically charge for labor or other services provided to government, consumers, or other businesses
4. Real estate businesses	d) produce raw material, such as plants or minerals
5. Service businesses	e) deliver goods and individuals to their destinations for a fee
6. Transportation businesses	f) sell, rent, and develop of properties including land, residential homes, and other buildings
7. Utilities	g) include banks and other companies that generate profits through investment and management of capital
8. Manufacturers	h) act as middlemen and get goods produced by manufacturers to the intended consumers, and make their profits by marking up their price
9. Retailers	i) produce products, from raw materials or from component parts, then sell their products at a profit

Task 4. Vocabulary Practice

Read the text and fill in the gaps with the words / phrases from the table below. You have 10 minutes to complete this task.

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[47] The text is borrowed and modified from http://en.wikipedia.org/wiki/Business and http://www.freshbooks.com/blog/2013/08/21/business-structure-choose-the-best-one-for-you/#sthash.eLCBFCSp.dpuf as of 18th December 2012.

A (1)…………. is a voluntary association of people formed for the (2)………of doing some (3)………... The company can sue and it can be (4) ………... It has its own name and is a separate (5) ……….., distinct from its members who constitute it. A company has its own property; the members – (6) ……….. cannot claim the property of the company as their own property. The (7) ………. of the members of the company is (8)………. to the amount of shares they hold. Shares of a company are easily transferable. It means the business can be (9)…………. from one hand to another without attracting (10)………. and duties.

1	a. sole proprietor	b. legal entity	c. company	d. business
2	a. reason	b. purpose	c. action	d. profit
3	a. money	b. deed	c. action	d. business
4	a. sued	b. suit	c. suited	d. said
5	a. physical entity	b. legal entity	c. structure	d. budget
6	a. moneyholders	b. team-mates	c. investors	d. shareholders
7	a. liability	b. opportunity	c. variety	d. possibilities
8	a. cut	b. depend	c. limited	d. named
9	a. run	b. transferred	c. thrown	d. driven
10	a. laws	b. sues	c. taxes	d. judges

Task 5. Language in Use

Every professional needs to talk or write about his / her working activities. These skills are especially useful in professional discussions and in writing applications or business letters. Study the box explaining the ways of expressing activities. After doing so, insert the words in the appropriate form in the passages. You have 10 minutes for this task.

Expressing Activities

We can express activities using the **gerund:**
1. After certain verbs and expressions:
   admit, appreciate, avoid, consider, delay, enjoy, finish, imagine, involve, postpone, propose, risk, stop, suggest
   e.g. *The department manager **postponed launching** the new line of a product.*

> *The job **involves analysing** changing processes.*
> 2. After prepositions:
>   **after, before, by, when, while, without**
>   e.g. *The company expanded **without analysing** the risks.*
> 3. After verbs and expressions followed by prepositions**:**
>   **to be good at, to be interested in, to be for/against, to be used to, instead of, to think about, to look forward to, to succeed in, to approve of, to insist on, to object to**
>   e.g. *I am **interested in participating** in the project.*
>   *I am **looking forward to hearing** from you.*
>   We can also express activities by using the **<u>infinitive</u>**:
> 1. After certain words:
>   **afford, agree, choose, decide, help, forget, hope, learn, manage, offer, plan, promise, refuse, seem, tend, threaten**
>   e.g.*I **hope to find** a job in banking.*
>   *I **decided to quit** this position.*
> 2. After modals:
>   **can, could, may, might, must, shall, should, will, would have to, ought to, used to**
>   e.g. *You **might have** problems with the Internet connection today.*
>   *You **should come** to an interview tomorrow.*

A. **build**   **put**   **make**   **set up**   **bring**   **transform**

John S. Pemberton invented Coca-Cola in 1886. His partner suggested (1)_____an advertisement for the drink in the Atlanta Journal that very year. In 1888, Asa Candler bought the Coca-Cola business and decided (2)_____ the product known through signs, calendars and clocks. The company began (3)_____its global network when Robert Woodruff was elected president of the company in 1923. He succeeded in (4)_____Coca-Cola into a truly international product by (5)_____a foreign department, which exported Coca-Cola to the Olympic Games in Amsterdam in 1928. During World War II, he promised (6)_____Coca-Cola to every soldier in every part of the world.

B. **decide**   **appear**   **reflect**   **create**

Coca-Cola's advertising has always attempted (1)_____ changing contemporary lifestyles. (2)_____an international advertising campaign requires the talents of professionals in many areas, and extensive testing and research are always done before (3)_____which advertisements will finally be used. Celebrity endorsements have featured heavily – Cary Grant, Ray Charles and

Whitney Houston are just three of the big name stars who have agreed (4)_____in Coca-Cola commercials.

C.   return   expand   drink   change   launch

After (1)_____ Diet Coke in 1982, the company saw its sales grow quickly. The drink is now the third most popular in the world. In 1985, the company tried (2) _____ the secret formula of Coca-Cola, but realised that Americans were very attached to the original recipe. The company listened to its consumers and quickly responded by (3)_____ the original formula to the market as "Coca-Cola Classic". Today, people in more than 160 countries around the globe enjoy (4)_____Coca-Cola. It is asked for more than 524 million times a day in more than 80 languages. The company intends (5)_____ its global presence even further in the twenty-first century, particularly in developing markets.[48]

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[48] The text is borrowed and modified from http://www-it.fmi.uni-sofia.bg/BEC/classroom/unit5/lngtask1.htm as of 18th December 2012.

Differentiated Activity

Task 6. Tiered Task

Choose and complete any part of the task suggested below. Prepare to report your results to the class. You have 10 minutes for this task.

Part 1. Look at the charts[49] representing typical company organizational structures. Explain them and analyse pros and cons of each type of structure.

Functional Organizational Structure
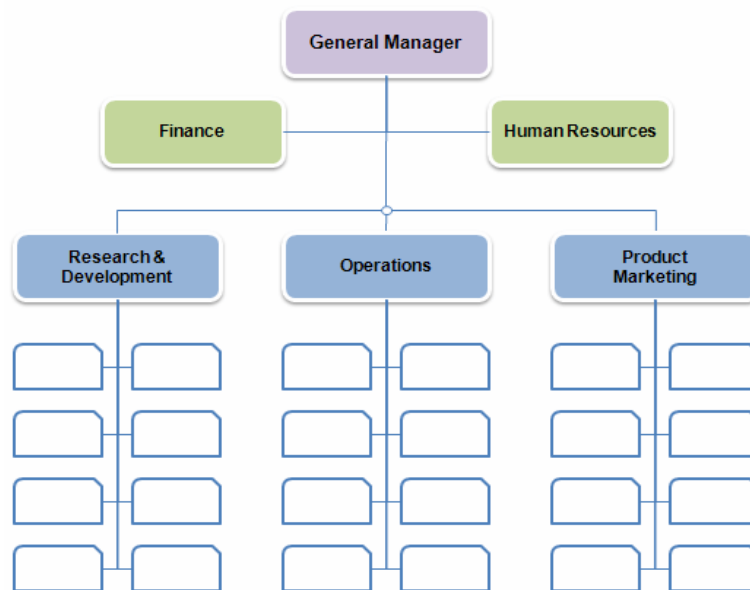
Sample Divisional Organizational Structure

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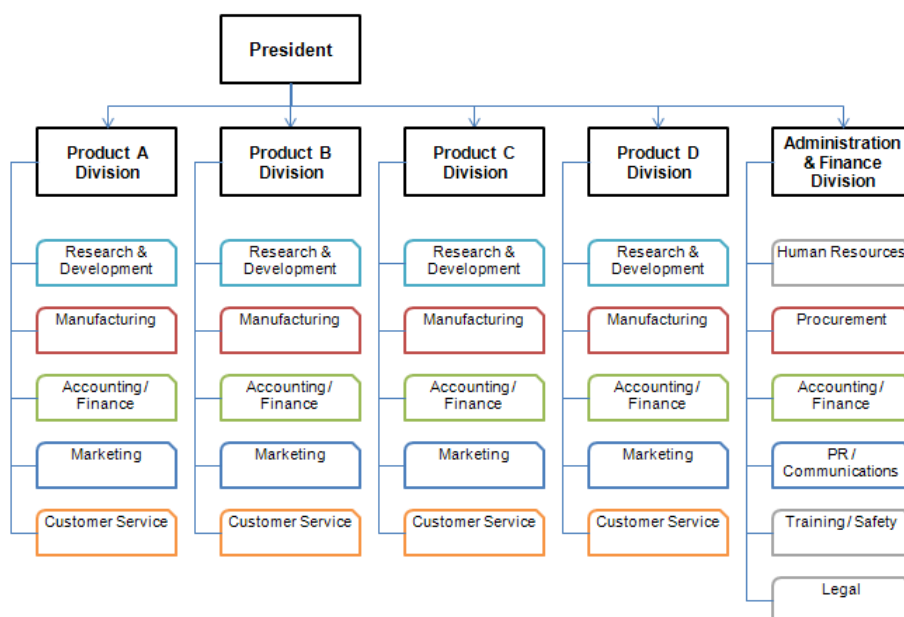
[49] The pictures are borrowed from http://www.dougsguides.com/organized as of 18th October 2013.

Part 2. Read an internal email from Microsoft chief executive officer Steve Ballmer to employees regarding changes in the company. Explain what organizational structure the company has taken and draw its scheme (you may look at Part 1 of this task as an example).

From: Steve Ballmer
To: Microsoft – All Employees
Date: July 11, 2013, 6 a.m.
Subject: One Microsoft

Today, we are announcing a far-reaching realignment of the company that will enable us to innovate with greater speed, efficiency and capability in a fast changing world.

We are rallying behind a single strategy as one company – not a collection of divisional strategies. Although we will deliver multiple devices and services, the single core strategy will drive us to set shared goals for everything we do. We will see our product line holistically, not as a set of islands. All parts of the company will share and contribute to the success of core offerings, like Windows, Windows Phone, Xbox, Surface, Office 365 and our EA offer, Bing, Skype, Dynamics, Azure and our servers.

How we organize our engineering efforts will also change to reflect this strategy. We will pull together disparate engineering efforts today into a united set of our high-value activities. This means we will organize the company by function: Engineering (including supply chain and datacentres), Marketing, Business Development, Advanced Strategy and Research, Finance, HR, Legal, and COO (including field, support, commercial operations and IT). Each discipline will help drive our overall strategy. Each discipline will also be charged with improving our core capabilities in its area. We must improve in all aspects of the business.

Lots of change. But in all of this, many key things remains the same. Our incredible people, our spirit, our commitment, our belief in the power of technology to make the world a better place for billions of people around the world.

Let's go.
Steve[50]

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[50] The text is borrowed and modified from http://www.microsoft.com/en-us/news/press/2013/jul13/07-11onemicrosoft.aspx as of 20th October 2013.

Part 3. Read the extract from the "Forbes" article and answer the questions:

Why are reorganizations risky? How often are they successful?
What are the examples of successful and unsuccessful reorganizations?
What is the aim of successful reorganization?
What was the reason of ABB near-failure? What was done to prevent it?
What type of organizational structure has ABB taken?

The Key To Successful Corporate Reorganization

New chief executives often feel compelled to reorganize their companies. In fact, nearly half launch some kind of reorganization during their first two years on the job.

But corporate reorganizations are risky investments of time, energy and resources, and many do little to improve the business. Chrysler restructured its organization three times in the three years preceding its bankruptcy and eventual combination with Fiat. None of those reorgs had much effect. A recent Bain & Company study of 57 major reorganizations found that fewer than one third produced any meaningful improvement in performance.

What do the few successful reorganizers know that so many others don't? The reorganizations that work best don't just reshuffle the boxes and lines on an org chart. Rather they improve a company's ability to handle its most important decisions. They speed up decision making and increase the proportion of effective decisions.

An example is ABB, the big Zurich-based power technology and automation company, which came close to bankruptcy in late 2002. One reason for its near-failure: Key decisions about big power-project bids involved negotiations among dozens of different ABB units, each with its own profit goals and incentives, and the process dragged on. A new CEO, Jürgen Dormann, analysed the decision failures and then cut through the tangled web by consolidating divisions and centralizing profit-and-loss accountability. The reorg worked – it restored ABB's ability to generate fast, competitive bids – because Dormann's team knew that the purpose of the new structure was to support and smooth the progress of those decisions and others that were equally important.[51]

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[51] The text is borrowed and modified from http://www.forbes.com/2010/07/30/corporate-reorganization-abb-ford-leadership-managing-bain.html as of 20th October 2013.

Task 7. Reading

You are going to read the text about the news in Microsoft Corp. Choose any part you feel confident to complete or do them all.

The faces behind Microsoft's re-organization

The reorganization Microsoft Corp has announced represents the most sweeping re-structuring of the world's largest software company since 2008. The move is designed to better align Microsoft's operations, with Chief Executive Steve Ballmer's stated goal of becoming a "devices and services" company. Microsoft's stronghold of providing software for PCs is under threat as consumers and corporations increasingly turn to mobile devices, such as smart phones and tablets, and to Web-based software.

Gamers Can't Handle the New Female Head at Xbox

Microsoft's new company reorganization promotes Julie Larson-Green, a 19-year company veteran, to head up Xbox — a position recently left vacant by Don Mattrick in a move that has a lot of gamers very, very upset because she's a woman, who supposedly has no gaming experience. When the news hit the social gaming news site N4G, commenters were quick to point out her shortcomings.

Microsoft to unveil big management reorganization

Microsoft will unveil its biggest management reorganization in at least five years, to better compete in a world of mobile devices and Web-based services. The changes will shift the duties and responsibilities of many top Microsoft executives and are intended to eliminate overlap within the 98,000-employee company.[52]

Part 1. Decide whether the following statements (1-5) are true (T) or false (F). Justify your answer.

a. Microsoft Corporation has announced large restructuring. □

b. Microsoft leading position is under threat because consumers turn to mobile devices. □

c. Gamers are satisfied with the new Xbox head. □

d. The reorganization Microsoft is unveiling is biggest in 20 years. □

e. The changes will shift the duties of many executives. □

Part 2. Fill in the gaps:

The (1)............. of Microsoft Corp represents the most sweeping re-structuring of the world's largest (2)...........company since 2008. The move is (3)............to

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[52] The text is borrowed and modified from http://www.youtube.com/watch?v=MXQheBSTGt0 as of 20th October 2013.

better align Microsoft's operations, with (4)............ Steve Ballmer's stated goal of becoming a "devices and (5)..........." company. Microsoft's stronghold of (6)............ software for PCs is under threat as (7)............. and corporations increasingly turn to mobile (8)..............., such as smart phones and (9) ...., and to Web-based software.

Microsoft will unveil its biggest (10)............... reorganization in at least five years, to better (11) .... in a world of mobile devices and Web-based services. The changes will shift the duties and (12) .... of many top Microsoft (13)........... and are intended to eliminate overlap within the 98,000- (14) .... company.

Part 3. Answer the following questions:

1. What is the reason of Microsoft Corp reorganization?
2. Why is the leading position of Microsoft Corp under threat?
3. Why are customers not satisfied with the new Xbox head?
4. How will the changes influence Microsoft executives?

Task 8. Pair work

Act a dialogue between a CEO and the head of Business Development department about risks of restructuring. In your dialogue, use the following words in bold. You have 5 minutes for this task.

Avoid, consider, involve, suggest, decide, help, manage, plan, propose.

Task 9. Group Work

Read the below given profile of Optima corp. Imagine that you are the shareholders of Optima corp. and look through the list of candidates for the CEO position. Discuss the advantages and disadvantages of each of them and decide who will be the most suitable candidate for the position. You have time until the end of the class.

Optima profile. Optima, a large European retailing chain, is having serious financial difficulties. Its CEO, Johan Dvark has not been able to lead company to success for the last two years. The company`s profit has drastically fallen and share value decreased in half. The board of directors together with shareholders have decided to have a meeting and appoint a new person for CEO position.

Mark Wales, successful CEO of a chain of department stores who was losing money since the restructuring of his company. His main idea is to cut

growth targets by half. He believes in slow but steady progress. His strategy will mean a short-term fall in profits. He expects a high share stake and a salary of €700, 000.

Mary Benks, current COO. He plans to increase the dividends at once by successful restructuring of company organization. He argues that newcomers lack the knowledge of the company and its staff. His current salary is €600,000 and he wants a substantial increase plus proposes not to replace himself as COO and do both jobs.

Phillip Johnson, CEO of famous and successful European company. He claims that he can succeed in 200 days through dramatic overall changes. He is the most expensive candidate at €800,000. He wants at least 10-year contact and substantial pension.

Optional Activity

Task 10. Facilitated Task

Read the text about business and enterprise. Give definitions to the words / phrases in bold.

A **business** or enterprise is a method to organize work. In a business, one or more people work together to make and sell products or services. Other people, called **consumers**, buy the products and services. The business owner (**employer**) is the person who hires people for work. Sometimes a company hires people called **employees** for work. A business can earn a profit for the products and services it offers.

Some businesses are created to get more money (**profit**) for the owner of the business. Other businesses are created to give a service without getting more money. Businesses can be big or small. For example, one person can open a small barber-shop. If there is one owner of an enterprise, he is called a **sole proprietor**. A big business, like Microsoft, employs thousands of people all over the world. This kind of ownership is called a **corporation**.[53]

Task 11. Complex Task

Read the article about cultural peculiarities of doing business from "The Economist". Replace the words / phrases in bold with their synonyms. Explain what was the reason of Walmart`s failure and what could have been done in order to prevent it.

Fish Can't See Water: How National Cultures Can Make or Break Your Corporate Strategy

By Kai Hammerich and Richard Lewis

In the 1990s Walmart decided to advance into German territory. It was the biggest **retailer** in the world, with 3,800 stores in America alone and a **huge pile of cash to spend**. And Germany's retail sector was in a **lamentable** state. The Arkansas giant bought two German chains – Wertkauf (with 21 stores) and Interspar (with 74) – and immediately began Americanising them. There were greeters at the door to wish shoppers a good day and strict instructions to smile at customers.

The result was a **disaster**. The have-a-nice-day stuff **went down** like a lead Zeppelin with employees and shoppers alike. And Walmart **compounded** its

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[53] The text is borrowed and modified from http://simple.wikipedia.org/wiki/Business as of 20th October 2013.

mistakes by putting an American expat **in charge of** the German operations (he insisted on everybody speaking English). The company lost $150m a year and soon decided to sell out to a German rival, Metro.

Coping with cultural differences is becoming a **valued** skill. The advance of globalisation, particularly the rise of powerful emerging countries such as Brazil and China, means that companies have to deal with business and consumers from a wider range of backgrounds. And the shift from a manufacturing to a service-based economy means that companies have to manage complicated ideas rather than relatively simple production processes. Western managers must understand **consumers** in São Paulo and Beijing. They also need to know how to tap into knowledge centres halfway across the world.

Yet many companies are bad at understanding culture. No serious business would dream of spending hundreds of millions buying a **subsidiary** without doing a thorough audit of its books. But Walmart **advanced** into the German market without bothering to make even the most rudimentary inquiries about German culture.

In "Fish Can't See Water" Kai Hammerich, a Danish headhunter, and Richard Lewis, a British linguist, try to teach company directors to see the water that they are swimming in. They not only **argue** that "the biggest **obstacle** to successful globalisation is the inability of most companies to understand the world view and aspirations of partners and competitors."

But they also try to bring casual cultural observation into the world of management theory. They argue that world civilisation can be divided into three **global archetypes**: linear-active, multi-active and reactive. Linear-active culture stresses timekeeping and getting-to-the-point and dominates in North America and northern Europe. Multi-active stresses emotion and sociability and dominates in southern Europe and Latin America. Reactive stresses "face" and harmony and dominates in Asia. But different countries stand in different positions on these various continuums: India is halfway between reactive and multi-active and Canada halfway between linear-active and reactive.[54]

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[54] The text is borrowed and modified from http://www.economist.com/news/business-books-quarterly/21587760-why-culture-should-be-cool-crossing-divide as of 20th October 2013.

Lesson 12

Whole-Class Activity

Task 12. Do or check Tasks 1-2 in your Workbook (10 minutes).

Task 13. Report the results of your Internet search. Ask each other questions about the details of business success of a chosen company (10 minutes).

Task 14. Discuss the following questions (5 minutes). Turn to the help box if necessary:

1. What is a business letter?
2. Who writes business letters?
3. What are common purposes of business letters?
4. What style of language is used in a business letter?
5. What are its characteristics?
6. What should be omitted in business letters?
7. What are the necessary components of a business letter?
8. What is the optimal length of a letter?

> A **business letter** is a formal way of communicating between two or more parties. It is usually used when writing from one company to another, or for correspondence between such organizations and their customers, clients and other external parties.
>
> Reasons to write a business letter include: to request direct information or action from another party, to order supplies from a supplier, to identify a mistake that was committed, to reply directly to a request, to apologize for a mistake etc. A business letter is useful because it produces a permanent written record, is confidential, and formal.
>
> A business letter, disregarding of its purpose should have the following components:
> - Writer's address
> - Date
> - Reader's address
> - Salutation
> - Text
> - Complimentary close
> - Signature
> - Typed name

Task 15. Analyse the following sample of a business letter. What is the purpose of the letter? Look through its elements (1-8) and decide which parts of a business letter they constitute. Make up a template for a business letter. You have 5 minutes for this task.

(1)_____   Hyper Soft Company
                          12187 West Hardware,
                          Fairfax, VA 22030

May 16, 2013 _____ (2)

Julie Brands
15456 Pyramid Way
College Park, FL 33133 _____ (3)

Dear Ms Brands, _____(4)

   Thank you for your letter requesting information about our Hyper Soft service center. The following clarifies services what we offer:
• **Support** & **Maintenance** for any software on laptops, desktops, and smart phones.
• **Antivirus Software** – installation and activation of antivirus software for safeguarding your computer and data from viruses and worms.
• **Encryption Software** – providing whole-disk encryption to protect sensitive data on laptops and external hard drives.

   With our expert maintenance, your software will be secured from flaws and guarantee high performance of your computer. If you purchase a visit to our center by the end of this month, we will offer you a 10 % discount. Please contact our service representative at 455-4534. _____(5)

Sincerely,   _____ (6)

Becky Sandars,   _____ (7)

Becky Sandars, customer service manager _____(8)

Task 16. Business Letter: Writing Techniques

   Read the article from the "Forbes" magazine about effective business writing. Choose the appropriate headings to each paragraph thus creating a list of effective communicative characteristics of a business letter (15 minutes).

A. Analyse Your Audience   D. Provide Evidence
B. Make It Clear and Concise   E. Deal with Their Objections
C. Structure Your Writing   F. Establish Your Purpose

6 Steps to Influence Others with Your Business Writing

Business writing used to be simply about getting information across to others. But nowadays, in order to succeed in your aim, you have to *influence*, not just communicate, with your writing. Not only advertisements, sales material or proposals need to influence. Whether you are competing for business or competing for career advancement in your organization, everything you write should be designed to influence the readers. Follow these six steps to make your business writing effective and influencing:
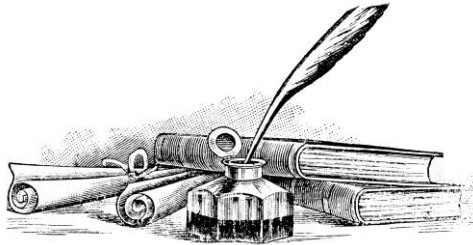
1. _____

Everything you write needs to have a purpose, otherwise why would you bother writing it? For example, when you write a letter to a customer, you want them to agree with your position, buy more from you or simply feel good enough about their interaction with you that they'll become a repeat customer. By understanding the purpose of what you are writing, you can then develop the strategy you need to achieve the influence you want.

2. _____

To be influential, you need to know what will actually influence your audience. Then, you can write in a way that is tailored to what matters to them instead of what matters to you. Do this by targeting your message and your arguments to their interests.

3. _____

Possible objections of your audience are something you need to specifically deal with. Unlike a conversation or a sales call, you won't have the opportunity to clarify what you write or respond to their questions while they are reading. Think about questions they might ask or objections they might raise and answer them in the first place.

4. _____

Quite simply, facts sell. Don't be general when you talk about issues — provide evidence and facts that they can relate to, which means not just giving them raw numbers, but putting them in context. This is particularly important in a sales letter, proposal or other material you use for selling, but it is also important for internal memos, reports and business cases.

5. _____

No one has time to read long, fancy writing that makes the writer look like a scholar but quickly loses the reader. Your readers don't have the time to absorb long documents or complex sentences and paragraphs. Your goal isn't to impress the reader with your writing skills; your goal is to influence them. Keep your sentences as short as possible and don't write long, blocky paragraphs. Break them up to make them easier to read and absorb.

6. _____

Along with writing that's clear and concise, structure what you write to make it easy to read and to see the important information, arguments and points.

Use headings to introduce paragraphs and switch some paragraphs into bulleted lists, which will be easier to read. Use tables to present information, such as pros and cons, options or anything that you are comparing.[55]

Task 17. There are several types of business letters depending on their purpose: letter giving information, letter of request, letter of complaint, letter of apology etc. Look through the following extracts from the letters (1-12) and decide which type of a letter they belong to. (5 minutes).

Informational letter	1	We would appreciate if you would bring this announcement to your attention.
	2	I sincerely hope this is a one-time incident, and this will not happen again.
	3	I am planning a vacation to you area this summer and would like to get some information on about Williamsburg.
Letter of request	4	Unfortunately, after viewing the components that came with the product, I discovered that four of the parts were missing.
	5	Because of this serious mistake, and as a testament to our appreciation of you as our customer, we are going to provide you with your first three months of service free of charge.
	6	Can you also send me a list of events taking place around that time.
Letter of complaint	7	As our new letterhead indicates, we have recently changed the name of our business.
	8	The purpose of this letter is to convey my sincere apology for any inconvenience you may have experienced last month.
	9	Let me assure you that what happened in your case is not typical of our customer service.
Letter of apology	10	I am writing to request replacements for the missing parts of the product.
	11	We may also take some side trips during the week, so any information you may have on other locations around your area would also be helpful.
	12	Thank you for being one of our valued customers.

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[55] The text is borrowed and modified from http://www.forbes.com/sites/allbusiness/2013/07/01/6-steps-to-influence-others-with-your-business-writing/ as of 1st November 2013.

Differentiated Activity

Task 18. Group work

You have already analysed four types of business letters. There are still lots of other different and important types of them, each holding their own peculiarities and aims.

Look at following analysis of Letter of Application and find out what questions should be answered before writing this type of letter. After doing so, in small groups prepare similar analyses of the other types of business letters and report your findings to the class. You have 10 minutes for this task.

Type of Letter	Introduction	Body	Conclusion
Letter of Application	**Question:** Why are you writing? Answer: In response to a job advertisement **Question**: What are you writing about? Answer: Name the specific job opening.	**Question:** What exactly do you want to say? Answer: The reasons why you are qualified for the job.	**Question:** What is next? Answer: When can you meet with the personnel director to discuss this job opening?
Group 1 Sales Letter	**Question**: Why are you writing? **Question**: What are you writing about?	**Question**: What exactly do you want to say?	**Question**: What is next?
Group 2 Letter of Request	**Question**: Why are you writing? **Question**: What are you writing about?	**Question**: What exactly do you want to say?	**Question**: What is next?
Group 3 Apology Letter	**Question**: Why are you writing? **Question**: What are you writing about?	**Question**: What exactly do you want to say?	**Question**: What is next?
Group 4 Order Letter	**Question**: Why are you writing? **Question**: What are you writing about?	**Question**: What exactly do you want to say?	**Question**: What is next?
Group 5 Letter of Invitation	**Question**: Why are you writing? **Question**: What are you writing about?	**Question**: What exactly do you want to say?	**Question**: What is next?

Task 19. Group work

Look at the following list of common expressions which can often be found in business letters. Decide in what part of a letter (introduction, body or conclusion) they may be used. In group, discuss, what other expressions may be written in the mentioned parts of a letter. You have 5 minutes for this task.

I am writing to request…
Looking forward to hearing from you
If you have any questions, feel free to contact me at …
Moreover, ….
We appreciate your cooperation in this matter.
I received your June 16th letter requesting…
Let me know if you have any further questions…
First, ….
Additionally, ….
The purpose of this letter is to ….
Consequently,
Thank you for your prompt attention on this matter
As you may know,
In closing, I believe that…
This is in response to your request…

Task 20. Tiered Task

Formal style of writing is very important in business letters. It helps to create appropriate course of communication and achieve the final goal of mutual benefit. Read the following letters which contain inappropriate sentences and complete at least one part of the task. You have 15 minutes:

Part 1. Read the following letter and replace inappropriate sentences in bold (1-6) with the suggested options (a-f).

(1) **Hello Mr. Hamilton**,	a. Yours sincerely,
I received the catalogue that you sent today. (2) **I liked the way you dealt with my request.** It has all the details that I wanted for the jewelry designing. (3) **It surprised me how quickly you sent me the catalogue.** This will help me in fulfilling my professional commitments.	b. If I require some more designs, I will contact you in a week.
I have sent your payment for the catalogue. (4) **Check your bank account in a day or two.** Once again, thanks a lot for your quick service. (5) **I`ll certainly let you know if I need more designs**. If you don't receive the payment, you can call me and I will look into the matter.	c. I appreciate your prompt service to my requirements.
	d. I am pleased about the delivery in such a short span.
(6) **Best wishes**	e. Dear Mr. Hamilton
Marie Jennings	f. You will be receiving it within two days.

Part 2. Look through the business letter and rewrite the sentences in italics so that they become more appropriate.

(1) *Hello Mr. Kent,*

I am returning with this letter a recent shipment of 300 imprinted t-shirts (order #234A5) along with a copy of our original purchase order.

(2) *I have certainly told you that the logo must be reproduced in colour.* (3)*You have made a terrible mistake and sent me them printed in black!*

(4) *I will sue your company if you don`t* send another shipment of 300 t-shirts (with the correct logo colours) by the 10th of March. We need them for a company event that starts on the 20th of March.

(5) *Give this matter prompt attention and correct the mistake immediately.*

(6) *Bye,*

Miss Brandon.

Part 3. Find and correct stylistic mistakes in the following letter.

Good afternoon Mr. Moriarity,

The Board of Directors we wants you to come and to be the Closing Keynote Speaker at the upcoming 2015 IDCRI Conference.

The conference will be about "Latest Breakthrough in IT". It will probably be at Mountainview Conference Facility, in Montpelier, Vermont from December 3 to 5, 2015.

We want to let you know that Susan Crutchlow from Business & IT will be the opening Keynote Speaker. She`ll be talking about "The Perspective of IT in Business Sphere". Please check your e-mail for a draft of conference program in a couple of weeks. It will give you an idea of the specific subjects that will be covered by the other speakers.

Its gonna be a lot of visitors this year – about 2,000 delegates and 150 speakers. People will come from our new European Chapter that is based in Geneva.

In closing, it will be great if you agree to be our closing speaker at the 2006 ICDRI Conference. I will call you in a week or so to follow up on this.

Yours sincerely,
Richard Bagnall

Task 21. Pair work

Write each other a letter on one of the following topics. After doing so, exchange the letters and assess each other`s works according to the criteria given in the table below. You have time until the end of the class.

Student A. You have ordered MGPrt234 portable tablet in Buyonline Internet shop. But soon after the purchase you have found out that the tablet came without driver installation disk and headphones. Write a letter of complaint to the manager of the Internet shop and ask for replacement of the missing parts.

Student B. You are the manager of Buyonline Internet shop. You have received a letter of complaint from your customer. In the letter it is stated that the customer has received incomplete order. Write a letter of apology and assure your customer that he / she will receive the replacement as soon as possible.

	Questions	**Yes**	**No**
1	Has the student provided the eight letter essentials?		
2	Does the student`s Introduction explain why he or she is writing and what he or she is writing about?		
3	Does the Body explain what exactly he / she wants or plans to do?		
4	Does the Conclusion explain what`s next, specifying when there should be a follow-up action and why that date / time is important?		
5	Is the letter clear, answering reporter`s questions and specifying?		
6	Is the letter concise, limiting sentence length and paragraph length?		
7	Does the letter provide an accessible document design, using highlighting techniques effectively?		
8	Does the letter achieve audience recognition?		
9	Does the letter achieve audience involvement by personalizing through pronoun usage?		
10	Is the letter accurate, abiding by all grammatical conventions?		

Optional Activity

Task 22. Facilitated Task

Look at the following business letter. Some sentences have been removed from their places. Fill in appropriate sentences from the right column into the gaps.

Kenneth Lee Customer Service Manager LG World 2310 West Kimberly Road, Davenport, IA, United States(563) 388-6082 May 08, 2008 Patricia Davis 404 Arrowhead Drive, Denison, IA,United States (712) 263-2012 Dear Ms. Davis, 　　(1)………………………………………………………… … My company is late in fixing your air conditioner. I just saw the request that you had sent on May 1. 　　(2)………………………………………………………… ……There were many changes in the company during last week and therefore your request was ignored. 　　(3) ………………………………………………………….. You had to wait for a week so I will make sure that it is fixed as soon as possible. 　　(4) ………………………………………………………… In the next two months, you also don't have to pay any charge for the servicing that we provide for your air conditioner. 　　(5)………………………………………………………… … I assure you that such a thing will not happen in future. We will be providing good service for all the products that you have bought from our company. We are committed to give best service to our customers. (6) ….............................. …………………………………………………………........….. 　　You can contact me on phone at (563) 388-6082 for any further requirements. (7) ……………………………. 　　(8) …………………………… 　　Kenneth Lee	You need not pay any charges for the service that we provide today. Once again, I am sorry for the trouble. I am writing this letter to convey my apologies for the inconvenience. You have been a valuable customer for us. I am always there to serve you. I have reviewed your request and will be sending the person to fix your air conditioner by today evening. Yours sincerely I was not in the office and have just returned from a week long holiday.

Task 23. Complex Task

A letter of complaint is truly one of the most difficult letters to deal with. In order to answer them, one needs to be highly qualified, polite and understanding. Read the following letter of complaint and write an answer to it. Ensure that you provide an apology and assure your customer in better service in future.

<div align="right">

Anthony Thomson

G Soft Consultancies

6330 Brooklyn Boulevard,

United States

</div>

Date: February 12, 2009

Nancy Adams

Eve's Training Academy

231Pillsbury Drive Southeast,

United States

Dear Ms. Adams,

One of our employees, Sarah Parker attended your two day work shop on "Credit and Risk Management" on February 10 in Minneapolis. She was disappointed with the teaching methodology of the trainer and the content of the session. The outline of the course given on your brochure was altogether different than what was dealt with in the training.

Your course outline gave four topics under the heading Risk Management but in the training only one hour was spent on what is the concept of risk management. Other points were not dealt in depth. The trainer was not in a position to answer the queries due to sheer lack of practical knowledge.

Sarah travelled all the way to attend your session. She did not gain anything out of it. Your academy should refund half the amount paid as she did not attend the entire two day workshop. We need refund of $ 250 paid as a registration fee. With this letter, we are enclosing the photocopy of the registration for your perusal.

We had high expectations from the training. But nowadays, the quality of your trainers and the entire management of your academy are degrading. You have to seriously look into it.

If you need to discuss anything with me or Sarah, you can contact us on phone at (763) 503-3534 or gsoft@gmail.com. We look forward for your reply.

Yours truly,

Anthony Thomson[56]

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[56] The text is borrowed and modified from http://ru.scribd.com/doc/44436972/Types-of-Business-Letter as of 16th September 2013.

Unit 7. Banking

Lesson 13

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about banking. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. How can we define a bank?
2. How do banks earn money? Name as many ways as possible.
3. What are the risks of online banking?

Practical Concern

1. What are the names of national and international banks of your country?
2. What are the most popular banks of your country?
3. What types of bank accounts do you know?

Analytical Concern

1. What are the advantages and disadvantages of having a saving account in a bank?
2. What should be analysed before choosing a bank?
3. What are the pros and cons of online banking?

Creative Concern

1. How should a perfect bank look like?
2. What atmosphere can make people feel good at bank?
3. What kind of advertising campaign can a bank run to attract more clients?

Task 2. Reading

Read the text about the ways in which banks make profit. After doing so, explain the meaning of the words in bold to the class. You have 20 minutes for this activity.

Making Profit from Money

Banks are companies (normally listed on the **stock market**) and are therefore owned by, and run for, their shareholders. As any other company, banks need to make enough money to pay their employees, maintain the buildings and run the business.

There are three main ways banks make money: by charging **interest** on money that they lend, by charging **fees** for services they provide and by trading financial instruments in the financial markets.

Retail and commercial banks need lots of customers to deposit their money with them, as the banks use these **deposits** to earn enough money to stay in business. To encourage people to keep their money in a bank, the bank will pay them a small amount of money (interest). This interest is paid from the money the bank earns by lending out the deposited money to other customers.

The banks **lend** money to customers at a higher **rate** than they pay to depositors. The difference, known as the **margin or turn**, is kept by the bank. For example, if a bank pays 1 % interest on deposits, they may charge 6 % interest on loans. Lending takes the form of **overdrafts**, bank loans, **mortgages** (loans secured on property) and credit card facilities. Loans approved by banks will vary in size, and may have fixed or variable interest rates.

Deposits are the banks' **liabilities**. If everyone was to demand their money back at once, the bank would not be able to pay. Because they lend money out, banks are required to carry a cushion of capital so they have sufficient money to pay those customers likely to withdraw their money at any time.

Another way banks make money is through charging fees. Most retail and commercial banks will charge for specific services, for example, for processing cheques, for other **transactions** and for unauthorised borrowing e.g. if a client exceeds an **overdraft limit**.

Investment banks earn huge fees for advising large companies and public institutions on issuing **bonds** and shares (securities), and from **underwriting** these issues. Investment banks also make their money by trading **securities** in the secondary markets. Their aim is to sell these securities for more than they pay for them or purchase them for less than they sold them. The difference, called the turn, is kept by the bank.

Banks also buy and sell currencies of all the nations of the world, trying to take advantage of the different prices of these currencies against each other, which are changing all the time.[57]

Task 3. Vocabulary Practice

Look at the table[58] showing variety of bank types. Match the types of banks (1-8) with their descriptions (a-h). You have 5 minutes for this task.

1. **Savings Banks**	a) these banks are not for the general public or community. They serve entirely for private personnel's assets and transactions alone
2. **Commercial Banks**	b) these banks are specialized in providing mortgage loans alone. In order to sell loans they depend solely on the secondary market
3. **Mortgage Banks**	c) these banks are suited for employees with a monthly salary. Low waged people may open an account in this kind of bank
4. **Federal or National Banks**	d) these banks specialize in large organization's investments across the industry. They provide advice in the investments and promote corporate transactions
5. **Private Banks**	e) these bank collects money from people in various sectors and gives it as a loan to businessmen
6. **Internet Bank**	f) these banks have a wide spectrum of financial assistances to provide. Insurances to stocks, they promote everything across all countries around the globe
7. **Investment Banks**	g) provides banking facilities only via internet. There will be no physical contact with the bank
8. **Universal Banks**	h) these banks control the principles and policies of other banks across the country. These banks are managed and run by the government

Task 4. Vocabulary Practice

Read the text and fill in the gaps with the words in bold. You have 10 minutes to complete this task.

Credit, payment, cheque, account, balance, debit, cash, deposit, debit card, transactions, account statement.

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[57] The text is borrowed and modified from http://www.risksandrewards.org.uk/background_banks_151.html as of 4th November 2013.

[58] The text is borrowed and modified from http://typesofbanks.org/as of 4th November 2013.

Dear Mr Bodler,

The purpose of this is to clarify the matter with my bank account # 34568790.

I opened a(n) (1) ………. with your bank on 12th October with a cash (2) …….. of £ 500. On 15th October I took out £ 40 in (3) ………. from ATM. On 17th October I wrote a (4) ……… for £ 67 and it appeared as a (5) ……… on the bank statement the next day. On 25th October the bank also debited £ 48 from my account for a(n) (6)……….. I made using my (7) ………. . On 30th October I received my monthly salary directly into my account and it appeared as a(n) (8)……….of £ 1700,87. Although no further (9) ………. were made on my account, I finished the month with a (10) ………. of £ 2024.31. As you may see, the sum of £ 21,55 is missing and it has not appeared on the (11) ……….. I am afraid it has been some kind of mistake and I would like if you give this matter your consideration.

Yours sincerely,
James Blake

Task 5. Language in Use

Giving reasons is very important not only in everyday life, but also in professional sphere. The ability to explain why you make certain choices gives your opinion additional value and objectivity. Study the box explaining the ways of giving reasons (5 minutes).

Giving Reasons

We can give reasons using different words and expressions:
because, **due to, so that, as, in order to, since, the reason ... is to.**
1. *I've decided to withdraw my saving account **because** I need money for travel.*
2. *The transaction was cancelled **due to** customer's request.*
3. *I need to go to the bank **so that** I can open an account.*
4. ***As** we are going to expand, we need to analyse the risks.*
5. *I couldn't make transaction **since** the bank was closed.*
6. *We have printed account statement in order to see the record of all transactions.*
7. ***The reason** we want to reduce the price **is to** increase sales.*

Match the situations with the reasons. Compose sentences using appropriate expressions. You have 5 minutes for the task.

1	Meeting cancelled	wrong password
2	Bank closed on Monday	company had low profit
3	Access denied	earn profit
4	Interest rate changed	the end of deposit period
5	Share price fell	poor weather conditions
6	Banks lend money	continually going in overdraft
7	Bank account closed	public holiday
8	Money withdraw	raise money from deposits

Differentiated Activity

Task 6. 🔊 Listening

You are going to watch a video about online banking. Choose any part of the task you feel confident to complete or do them all. You have 10 minutes for the task. To watch the video, use the following link: http://www.youtube.com/watch?v=ddqh7D4EGdQ.

Part 1. Look through the following statements and say which of them were mentioned in the text.

1. The Internet has dramatically changed the way of banking operation.
2. You can create banking account in real-time.
3. Typing URL manually ensures you are visiting the true site.
4. Never enter personal information in a pop-up screen
5. Use firewalls to prevent fishing attacks.
6. Typing "https" will take you to the secured site.
7. Be careful with email spam that can endanger your computer.
8. Create strong password to secure your site.
9. Don't conduct operations on public computer.
10. Never email personal or financial information
11. Don't use laptop to log into the site.
12. Check your online accounts and bank statements regularly
13. Always remember to log out the system.
14. If possible, avoid viewing your account statement online.

Part 2. Insert the words into the missing gaps

Banking used to be a tremendous hassle. The Internet has made banking extremely (1) ………... You can check your (2) ………., transfer (3)………., and even monitor your (4) ………. and investments in real-time. But with that convenience comes (5)………. Here are some simple tips to remember to help keep you – and your money – safe.

Always type in the URL of your (6) ………... Typing in your bank's URL (7) ………… ensures you are visiting the true site.

Use the (8)………….. connection to your financial institution. Most banks automatically take you to their secured (9) …………. If not, try using (10) ………. when typing in the URL.

Create strong, unique (11) ……… for each of your online (12) …………..

Don't conduct online banking at a (13) ………... computer. Use your home desktop or laptop to make your (14) ………… or check balances.

And finally, and perhaps the simplest tip of all, remember to (15) ……..
when you're finished.

Part 3. Name and explain all the preventative measures which were suggested in the record. Tell which one is the most important and why. Suggest your own tips on how to make online banking safe.

Task 7. Tiered Task

Choose and complete any part of the task suggested below. Prepare to report your results to the class. You have 10 minutes for this task.

Part 1. Work out the topical content of Task 2 and Task 3. Create a scheme of banking system, which should contain such blocks as types of banks, ways of banks `raising money etc.

Part 2. Read the text form Task 2 once again and give definitions to the following terms:
stock market, **interest**, **fees**, **securities**, **lend**, **margin, overdrafts**, **mortgages**, **transactions**, **bonds**, **deposits**, **liabilities**, **underwriting**, **overdraft limit.**

Part 3. Look at the following chart[59] depicting the relation of recession and mortgage rates. Analyse the chart and answer the questions:

1. How do mortgage rates relate to recession?
2. How have rates changed overtime?
3. What are the highest and the lowest rates during past 45 years?
4. What is the average mortgage rate?

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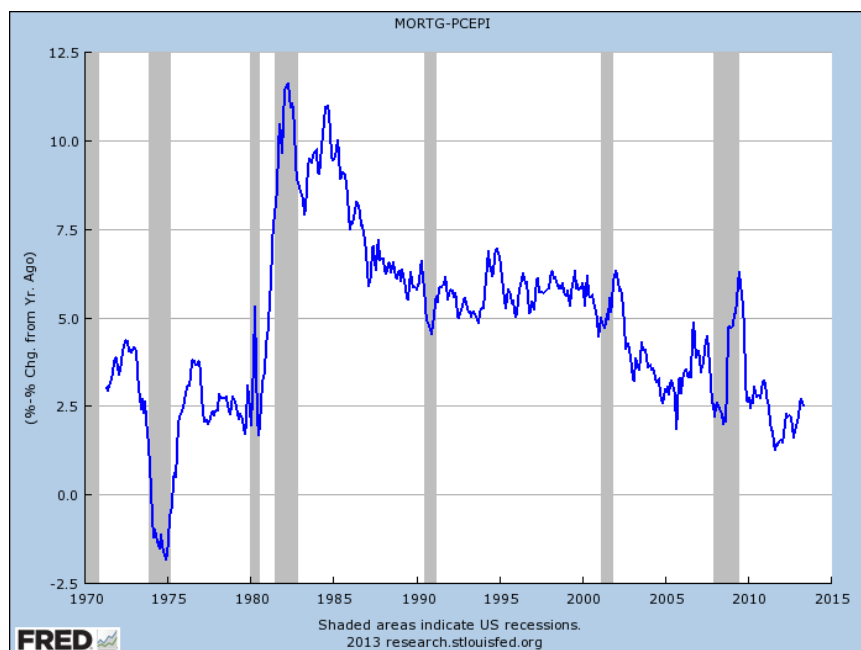
[59] The chart is borrowed from http://www.jparsons.net/housingbubble/ as of November 1, 2013.

Task 8. Pair work

Act an interview with a bank representative explaining the principles of bank operation. You have 10 minutes for this task.

Interviewer. You have received a task to make an interview about causes of some bank operations. You have made notes of several questions you want to ask. However, you may come up with more questions during the interview.

1. Why do banks charge higher rates on loans than they pay on deposits?
2. What is the reason for banks to have a "cushion of capital"?
3. Why are banks interested in trading securities?
4. What causes the interest rate fluctuation?

Bank representative. You are going to give an interview and explain the reasons of some bank operations. You may turn to Task 2 and Task 5 for help.

Task 9. Group Work

You are the members of the credit committee of ABC Bank. You are responsible for assessing the credit standing and ability to repay debt of prospective borrowers. Today you have to discuss four asks for credit from different parties. Analyse their ability to repay debt, risks and sums of lending and make decision on whether to give loan or not. You have time until the end of the class.

Mr. John Mc Blake. Asks for credit of £ 10, 000 to set up sole proprietorship specialized in sewing and clothing design. Mr. John Mc Blake worked as tailor for ten years, currently unemployed. No credit history. Mr. Mc Blake claims to repay the debt in one year, agrees to receive a loan against property.

Buyonline. A startup business specialized in online retail asks for a loan of £ 30, 000. Buyonline plans to expand its business and open a subsidiary in another city. Buyonline has good credit standing; it successfully repaid the loan of £ 10, 000 previous year. Current annual revenue of a company is estimated as £ 20, 000.

Venture LLC. A large company specializing in automobile trade asks for £ 10 million loan against assets for business development. The company is currently experiencing difficulties; its annual revenue fell by £ 30 million or 15 % from the previous year. Venture LLC has existing loan of £ 7,5 million in another bank.

H&R general partnership. Ms. Jane Holins asks for a loan of £ 250, 000 to buy the part of business belonging to her partner Mr. Ben Covy. The annual revenue of the business is £ 30,000. Good credit standing: 3 repaid loans of £ 5,000, £ 10,000 and £ 20,000 respectfully.

Optional Activity

Task 10. Facilitated Task

Read the text about banks. Find the words of the following categories and group them into the table:

Establishments	Types of money	Assets	People	Actions
bank	*loan*			
...	…			

A bank is a place where money can be saved or loaned out from. Someone's money can be placed in the bank for safe keeping, or the bank can give out loans to people for an agreement to pay the bank back at a later time, usually with interest. The people who run a bank are called bankers.

Banks also can use the money they have from deposits to invest in businesses in order to make more money.

In most of the modern world a bank settled by the government but independent of the state administrators controls how much money appears at a time. Such kind of bank is called a national bank. A national bank ordinarily issues bills and/or coins. In some countries issuing money is the task of the government.[60]

Task 11. Read the article about modern bank robberies from "Forbes". Answer the questions:
1. How has bank robbery changed overtime?
2. What is a KVM and what opportunities for robbery does it give?
3. What options does physical access provide to criminals?
4. What is the major source of security vulnerability?
5. What measures can be undertaken to secure access to money?

Classical Bank Robbery With A Cyber Twist

By John Nugent

Once upon a time, bank robbery was a swashbuckling trade – thieves would either hold up tellers at gunpoint or concoct elaborate break – in schemes that inspired a whole genre of Hollywood fantasy. But the game has changed considerably. Modern-day bandits in developed countries are far likelier to use keyboards than guns. It's big business, but not a very compelling screenplay.

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[60] The text is borrowed and modified from http://simple.wikipedia.org/wiki/Bank as of 10th November 2013.

Screenwriters might be heartened, then, by a pair of attempted heists earlier this year that married old-fashioned artistry with new-fangled technology. In each case, thieves entered London-based bank branches posing as IT technicians and attempted to install a wireless-equipped keyboard video mouse (KVM) switch onto bank computers. A KVM switch is a piece of hardware that enables third-party control of a computer; when coupled with a wireless modem a KVM switch allows control of the computer from a remote location. Attaching such an apparatus to a banking terminal can facilitate the remote transfer of funds from a bank's own computers. The bandits who tried this scheme at a Barclays branch made off with $2.1 million — though 11 of them were eventually tracked down and arrested. The thieves who carried out a similar plot at a Santander branch were sniffed out and arrested before they could access any funds.

As organizations become increasingly aware of the need to safeguard their networks from external attackers, the fundamentals of physical site security continue to be the bedrock of any plan to protect vital information. Physical access provides criminals and insiders a range of options. They can plug laptops into open ports or use a company's unprotected Wi-Fi to access corporate networks directly; they can access unlocked computers and download data to removable drives; or, as in the banking cases, they can install hardware or software that grants them remote access. Many companies already conduct regular network penetration tests; the risks posed by physical access suggest that these tests should be complemented by physical equivalents.

Data is only as secure as the weakest link within an organization and, as with other security threats, employees are a major source of vulnerability. Many cases of data loss can be traced back to employees' negligence or lack of security awareness; and the most costly incidents of IP theft are believed to involve corporate insiders. Indeed, in a joint study of data breaches the Ponemon Institute and Symantec found that 35 % of cases could be attributed to the 'human factor' – employee or contractor fallibility.

So what is a company to do? Information security training for employees is a good start. Of course, these measures should be complemented by a strong regimen of defence measures against cyber attacks – including encryption of hardware and software – and robust set of building access controls.[61]

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[61] The text is borrowed and modified from http://www.forbes.com/sites/riskmap/2013/11/08/classical-bank-robbery-with-a-cyber-twist/as of 11th November 2013.

Lesson 14

Whole-Class Activity

Task 12. Do or check asks 1-2 in your Workbook (10 minutes).

Task 13. Report the results of your Internet search. Ask each other questions related to the topic of your reports (10 minutes).

Task 14. Discuss the following questions (5 minutes). Turn to the help box if necessary:

1. What is e-mail?
2. What are the common spheres of use of e-mail?
3. What are the differences between official and private e-mail?
4. What is the difference between a traditional and an electronic business letter?
5. What are the necessary parts of an e-mail letter?
6. What is the required length of an electronic letter?

Electronic mail, most commonly referred to as **email** or **e-mail** since 1993, is a method of exchanging digital messages from an author to one or more recipients. Modern email operates across the Internet or other computer networks.

Internet email messages consist of two major sections:

- *Header* – Structured into fields such as From, To, CC, Subject, Date, and other information about the email.
- *Body* – The basic content sometimes containing a signature block at the end. This is exactly the same as the body of a regular letter.

The header is separated from the body by a blank line.

Task 15. E-mail: Writing Techniques

Read the article about writing a formal e-mail. Choose the appropriate headings to each paragraph thus creating a list of tips for effective e-mail writing (15 minutes).

A. Use a proper salutation.
B. Write the actual message.
C. Sign with your full name.
D. Start with the main idea in the first paragraph.

148

E. Use the correct form of leave-taking.

F. Use a short and accurate subject header.

G. Use a neutral e-mail address.

How to Write a Formal E-mail

In business, e-mails have replaced letters in much communication. The style is similar, but there are some differences. To write a formal email, follow these guidelines.

(1)_____Your e-mail address should be a variation of your real name, not a username or nickname. If you can, don't use extra numbers or letters.

(2) _____Avoid saying too much in the subject header, but make sure it reflects the content of your email to a person unfamiliar with you. If possible, include a keyword that will make the email content easier to remember and/or search for in a busy inbox.

(3)_____ Addressing the recipient by name is preferred. Use the person's title (Mr. Mrs. Ms. or Dr.) with their last name, followed by a comma or a colon. Optionally, you can precede the salutation with "Dear...". Using a last name is more formal and should be used unless you are on first-name terms with the recipient. If you don't know the name of the person you're writing to, use "Dear Sir/Madam" or "Dear Sir or Madam".

(4)_____Even though the purpose of the e-mail is summarized in the subject line, the purpose should be restarted in the first sentence. Busy readers want to know immediately why they are reading a message. Most messages should begin directly.

(5) _____Provide more information about the reason for writing in the body. Be sure to get your point across without rambling; if it's fluffed up, the reader may glance over the important details. Try to break up the message into paragraphs by topic to make your message more logical and digestible.

- The email should be no more than 5 paragraphs long and each paragraph should be no more than 5 sentences long.
- Insert a line break between each paragraph;
- Be sure to avoid informal writing.

(6) _____This will depend on your level of intimacy with the recipient. Usual variants include "Yours sincerely", "Respectfully" etc.

(7) _____If you have a job title, include that in the line after your name, and write the company name or website in the line after that.

If you do not have a job title but you have your own blog or website related to the content of the e-mail, include a link to that below your name. If the e-mail is about a job, only include a career-related website or blog, not hobbies or interests.[62]

Task 16. Analyse the following samples of e-mails and decide what variant is better. Compare them and try to name all the flaws and good points of the samples (5 minutes).

Sample A.

To: Keith Milton <keith.milton@apex.com>
From: Madeleine Espinoza <best_assistant @apex.com>
Subject: Problems
Cc:
Attached:
Pursuant to your request, I am responding. Your inquiry of April 29 suggested that you wanted to know how to deal with the database problems. In my opinion the biggest problem is that it all contains a lot of outdated information, including customers who haven`t purchased anything in five or more years. Another problem is that the old database is not compatible with the new software that is being used by our mailing service, and this makes it difficult to merge files. After much thought, I think I can solve both problems by starting a new database. This would be the place where we put the names of all new customers. And we would have it keyed using Access software. The problem with outdated information could be solved by finding out if the customers in our old database wish to continue receiving our newsletter and product announcements. Finally we would rekey the names of all active customers in the new database. Does this make sense? Maddy

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[62] The text is borrowed and modified from http://www.wikihow.com/Write-a-Formal-Email as of 18th November 2013.

Sample B.

To: Keith Milton <keith.milton@apex.com>
From: Madeleine Espinoza <madeleine.espinoza @apex.com>
Subject: How to Impove Our Customer Database
Cc:
Attached:

Dear Ms Milton,

As you requested, I am submitting my recommendations for improving our customer database. The database has two major problems. First, it contains many names of individuals who have not made purchases in five or more years. Second, the format is not compatible with the new Access software used by our mailing service.

The following three steps, however, should solve both problems:

1. Start a new database. Effective immediately, enter the names of all customers database using Access software.

2. Determine the status of customers in our old database. Send out a mailing asking whether recipients wish to continue receiving our newsletter and product announcements.

3. Rekey the names of active customers. Enter the names of all responding customers in our new database so that we have only one active database.

These changes will enable you, as team leader, to send mailings only to active customers. Please let me know by May 10 whether you think these recommendations are workable. If so, I will investigate costs.

Maddy
Madeleine Espinoza
Senior marketing Manager
E-mail: madeleine.espinoza @apex.com
Office: (987) 234-56-78

Task 17. A direct opening is important in writing an e-mail. Compare the following sets of message openers. Identify the one which illustrates a direct opening. Discuss the weaknesses and strengths of each (5 minutes).

1. **Inquiring to respond to questions**:
   a. Our company has lately been experiencing some difficulties connected with poor operation of our customer service site. We feel that the only way to improve our service and stay in touch with our customers is to renew the site. Thus, we would like you to answer several questions which may help us.

b. Please answer the following questions about our site operation, which we hope will help us in increasing the quality of our service.

2. **Announcing the meeting**:

a. For the past few years it has been the tradition of our company to hold annual meeting dedicated to improvement of company strategy. This year is not an exception and everyone who is interested in discussing our policy is welcome to attend the meeting on October 4.

b. We would like to invite employees interested in improvement of our company strategy to attend our annual meeting which will be held on October 4.

3. **Announcing the changes**:

a. It has come to our attention that increasing number of our staff members are using e-mail as means of effective communication. We would like to announce some changes in operation of our e-mail server.

b. The following new procedures connected with our e-mail server operation will come in force since Monday.

Differentiated Activity

Task 18. Group work

Read the task and complete the assignment of your group (10 minutes).

Group 1. Apart from being convenient in many ways, electronic mail has a lot of disadvantages. Make a list of pros and cons of an e-mail and be ready to report your findings to the class.

Pros and cons of electronic mail

Speed – the letter is delivered almost instantly	*Control – requires companies to establish usage rules*
…	

Group 2. Having learned how to write traditional and electronic business letters, compare them and report your findings to the rest of group.

	Traditional letter	Electronic letter
Common Features	*Style – formal, polite …*	
Different Features		

Group 3. *Netiquette (network etiquette) is* a philosophy of effective internet communication that utilizes common conventions and norms as a guide for rules and standards. In your group, discuss the following list of netiquette rules and suggest your own rules. Be ready to report your findings to the rest of your group.

1. *Care about tone – your words and writing style affect the reader*
2. *Don't forward without permission and beware of long threads – obtain approval before forwarding a message.*
3. *Acknowledge receipt – if you can`t reply immediately, tell when you can.*
4. *....*

Task 19. Pair work

Look at the following list of e-mail features. Decide which of them belong to good and bad writing techniques. In pairs, justify your opinion and propose your other characteristics of a good e-mail (5 minutes).

GOOD WRITING BAD WRITING

- Sending e-mail randomly to someone in the company saying "I'm not sure if you are the right person, but I figured you could forward this…"
- Electronic thank-you notes
- Clear and appropriate content of e-mail
- Using alias and extension like "gamenerd777@whatever.net"
- Blank subject line
- Clear and short subject line like "Application for system analyst position"
- Writing first and last names in greeting line ("Dear Mr. Jack Tomphson")
- Writing "Dear Sir or Madam" if the name isn't supplied
- Writing "Ms" if the marital status is unknown
- Starting by saying why you`re writing
- Starting by introducing yourself and small talk questions
- Using stylized fonts
- Using all capitals

153

- Giving full name and full contact information, including mailing address and phone number in signature block
- Including your job title in signature block
- Naming attachments by numbers (lttr2343)
- Sending a content-empty e-mail with attachment

Task 20. Tiered Task

After you have learnt and discussed the good and bad writing techniques of an e-mail, choose any part of this task and revise the suggested letter.[63] Analyse its good and bad points. You have 10 minutes for this task:

Part 1.

Dear Sally, Judy and Rebecca,

As most of you know, communication with clients is very important for most Client Services Managers. Several staff members came to me and announced their interest in learning effective communication skills. A seminar entitled "Effective communication for Business" will be held December 12. I am allowing the following managers to attend the seminar: Rebecca White, Judy Desley, Sally Fincey.

Best wishes, Frank

Part 2.

Hi, Jenny

Our company is moving towards new strategy of communication with clients. As you know, our department has started to run a new website and we are now on the stage of filling information. In connection to this, our task is to upload some instructions on how to write us e-mail into our site.

To write information for a Web site, there are three important tips to follow. For one thing, you should make the formatting as simple as possible. Another thing you must do is ensure the use of visual aids. Pictures and illustrations will make it easy for sure! And finally, you should limit directions that are not needed. Write only important ones!

Hope this will help.

Judy

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[63] The texts are borrowed and modified from http://bryantanner.files.wordpress.com/2013/05/bad-email.png as of 18th November 2013.

Part 3.

Jim,

I was thinking about the meeting and I started to wonder about a few things. I'm not sure if you're interested, but I hope this might help. I looked back through the paperwork and found a few old documents from Terry. Do you remember her? Anyway, I wondered about spreadsheet for a new product line. This one that Terry did made zero sense to me then, but now I think she was on to something. In column D, we could include a spot for the subtotals like she did. Maybe I`m nuts, but it might just work.

Hey, I also wondered which version of the logo you needed for next month's trade show. We have two or three, but I think Mary is doing another one if we need it.

Oh, and could you give me the title of the movie we were talking about. I really want to check it out.

Larry

Task 21. Pair work

Write each other a letter on one of the following topics. After doing so, exchange the letters and assess each other`s works according to the criteria given in the table below. You have time until the end of the class.

Student A. You are the CEO of BNC company. This year your company has changed its policy and you are going to keep working during some holidays. Write an e-mail to Human Resources manager and ask him / her to write suggestions on how to organize floating holiday plan in your company.

Student B. You are the Human Resources manager at BNC company. You have received an e-mail from your CEO informing you that your company is going to keep working during some holidays. Propose your variant of organization of floating holiday plan, where each employee will be able to take a day-off after the holidays. Also suggest that working hours during holidays should be restricted to 9:00-14:00.

	Questions	Yes	No
1	Has the student provided the e-mail identification lines (Date, To, From, Subject)?		
2	Does the Subject line provide clear and concise topic?		
3	Does the Introduction explain why the letter is written and what the author is writing about?		
4	Does the Body explain what exactly the author wants or plans to do?		
5	Does the Conclusion explain what`s next, specifying when there should be a follow-up action and why that date/time is important?		
6	Is the e-mail clear, answering the reporter`s questions?		
7	Is the e-mail concise, limiting sentence length and paragraph length?		
8	Does the e-mail provide an accessible document design, using highlighting techniques effectively?		
9	Does the e-mail achieve audience recognition?		
10	Is the e-mail accurate, abiding by all grammatical conventions?		

Optional Activity

Task 22. Facilitated Task

Look at the following e-mail. Some sentences have been removed from their places. Put the appropriate sentences from the right column into the gaps. Find and identify the constituent parts of an e-mail:
- *Header* – Structured into fields such as From, To, CC, Subject etc.
- *Body* – The basic content structured into introduction part, main body part, conclusion part and signature block.

(1)…......... john_clement@corp.com From: steve_nordec@corp.com Subject: (2) ………………………… Cc: Attached: (3) ...., Thank you for purchasing the starter pack of Agel. We will send your monthly account statements to provide you with the full transactions on your account with us. (4) .... Please call me directly at 777-5649 if you need further information or assistance. (5)…………… Steve Nordec, (6) ………………	Sincerely, Dear Mr. Clement We value your business and will do our best to respond fast to your business needs. Client Services Manager To: Thank you for buying Agel

Task 23. Complex Task

Read the article from "The Economist" about e-mail security. Answer the following questions:

1. Why was the prediction of Bill Gates "nearly right"?
2. What measures have been done to stop spam mail?
3. What does the phrase "it is moot whether the link is e-mailed, tweeted or liked" mean?
4. Why is the spam a social problem?
5. What measures does the author suggest to make online operations safe?

Dealing with Spam: Confidence Game

Bill Gates was nearly right in 2004 when he predicted the end of spam in two years. Thanks to clever filters unsolicited e-mail has largely disappeared for most on the internet. But spam is still a menace: blocked at the e-mail inbox, spammers post messages as comments on websites and increasingly on social networks. The criminal businesses behind spam are competitive and creative.

The anti-spam industry has done its work in saving e-mail. But it is always one step behind. When filters blocked spam with tell-tale words such as "Rolex", spammers misspelled them ("R0lex"). When filters blocked mail from suspect network addresses, the spammers used botnets (networks of hijacked computers) instead. In the end, the software industry's interest is in making money from the problem (by selling subscriptions to regular security updates) rather than tackling it at its source.

In any case, the real problem is not the message, but the link. Sometimes an unwise click leads only to a website that sells counterfeit pills. But it can also lead to a page that infects your computer with a virus that then steals your passwords or other information. Spam was never about e-mail; it was about convincing us to click. To the spammer, it is moot whether the link is e-mailed, tweeted or liked.

The police are doing what they can, and software companies keep on tightening security. But spam is not just a hack or a crime; it is a social problem, too. If you look beyond the computers that lie between a spammer and his mark, you can see all the classic techniques of a con-man: buy this stock, before everyone else does. Buy this watch cheaper than anyone else can. The spammer plays upon the universal human desire to believe that we are smarter than anyone, and that things can be had for nothing. As in other walks of life, people become wiser and take precautions only when they have learned what happens when they don't.

That is why the spammers' new arena – social networks – is so effective. People follow Twitter feeds from people they would like to know and make "friends" on Facebook whom they do not know at all. Hijack one such account, and you can exploit a whole network of trusting and trusted contacts.

A few fiddles might help, such as tougher default privacy settings on social networks. But the real problem is man, not the machine. Public behaviour still treats the internet like a village, in which new faces are welcome and anti-social behaviour a rarity. A better analogy would be a railway station in a big city, where hustlers gather to prey on the credulity of new arrivals. Wise behaviour in such places is to walk fast, avoid eye contact and be brusque with strangers. Try that online.[64]

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[64] The text is borrowed and modified from http://www.economist.com/node/17522616?zid=292&ah=165a5788fdb0726c01b1374d8e1ea285 as of 16th November 2013.

Unit 8. Market and Competition

Lesson 15

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about market structures. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. What is competition?
2. How does competition influence the market?
3. What can happen if there is no competition?

Practical Concern

1. What criteria do you take into account before buying any product?
2. What will determine your choice between two similar products?
3. What makes a market monopolistic?

Analytical Concern

1. What factors determine the winner in a competition?
2. What are the features of a competitive market?
3. Which industries are perfectly competitive?

Creative Concern

1. What part does advertising play in making buying decisions?
2. What kind of advertising strategy is effective nowadays?
3. If you had company, what would you do to attract customers?

Task 2. Reading

Read the text about basic market structures. After doing so, explain the meaning of the words in bold to the class. You have 20 minutes for this activity.

Monopolies, Oligopolies and Perfect Competition

Economists assume that there are a number of different buyers and sellers in the marketplace. This means that we have **competition** in the market, which allows price to change in response to changes in **supply** and **demand**. Furthermore, for almost every product there are substitutes, so if one product becomes too expensive, a buyer can choose a cheaper substitute instead. In a market with many buyers and sellers, both the consumer and the supplier have equal ability to influence price.

159

In some industries, there are no **substitutes** and there is no competition. In a market that has only one or few suppliers of a good or service, the producer(s) can control price, meaning that a consumer does not have choice, cannot maximize his or her total utility and has have very little influence over the price of goods.

A **monopoly** is a market structure in which there is only one producer/seller for a product. In other words, the single business *is* the industry. Entry into such a market is restricted due to high costs or other hurdles, which may be economic, social or political. For instance, a government can create a monopoly over an industry that it wants to control, such as electricity. Another reason for the barriers against entry into a monopolistic industry is that oftentimes, one entity has the exclusive rights to a natural resource. For example, in Saudi Arabia the government has sole control over the oil industry. A monopoly may also form when a company has a copyright or patent that prevents others from entering the market.

In an **oligopoly**, there are only a few firms that make up an industry. This select group of firms has control over the price and, like a monopoly, an oligopoly has high **barriers** to entry. The products that the oligopolistic firms produce are often nearly identical and, therefore, the companies, which are competing for market share, are interdependent as a result of market forces. Assume, for example, that an economy needs only 100 widgets. Company X produces 50 widgets and its competitor, Company Y, produces the other 50. The prices of the two brands will be interdependent and, therefore, similar. So, if Company X starts selling the widgets at a lower price, it will get a greater market share, thereby forcing Company Y to lower its prices as well.

There are two extreme forms of market structure: monopoly and, its opposite, **perfect competition**. Perfect competition is characterized by many buyers and sellers, many products that are similar in nature and, as a result, many substitutes. Perfect competition means there are few, if any, barriers to entry for new companies, and prices are determined by supply and demand. Thus, producers in a perfectly competitive market are subject to the prices determined by the market and do not have any leverage. For example, in a perfectly competitive market, if a single firm decides to increase its selling price of a good, the consumers can just turn to the nearest competitor for a better price, causing any firm that increases its prices to lose market share and profits.[65]

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[65] The text is borrowed and modified from http://www.investopedia.com/university/economics/economics6.asp as of 10th November 2013.

Task 3. Vocabulary Practice

Look at the table showing economical terms. Match the terms (1-8) with their definitions (a-h). You have 5 minutes for this task.

1. **Monopoly**	a) the amount of a good or service offered for sale
2. **Oligopoly**	b) market structure where no participants are large enough to have the market power to set the price of a homogeneous product
3. **Supply**	c) a market structure in which a market or industry is dominated by a small number of sellers
4. **Demand**	d) a party that offers goods or services
5. **Competition**	e) thing acting or serving in place of another
6. **Substitute**	f) a person who purchases goods and services for personal use
7. **Supplier**	g) a situation in which a single company or group owns all or nearly all of the market for a given type of product or service
8. **Consumer**	h) the desire of purchasers, consumers, clients, employers, etc., for a particular commodity, service, or other item

Task 4. Vocabulary Practice

Read the text and fill in the gaps with the words in bold. You have 10 minutes to complete this task.

Competition, demand, monopoly, structure, profit, industry, marketplace, quality, supplies, consumers, substitute, price

Perfect competition is a theoretical market (1) ………. It is primarily used as a benchmark against which other, real-life market structures are compared. The (2) ……….. that most closely resembles perfect competition in real life is agriculture. Perfect competition is the opposite of a (3) ………, in which only a single firm (4) ……… a particular good or service, and that firm can charge whatever (5) ………it wants because (6) ……….. have no alternatives and it is difficult for would-be competitors to enter the (7) ………….. Under perfect competition, there are many buyers and sellers, and prices reflect supply and (8) ……….. Also, consumers have many (9) …………. if the good or service they wish to buy becomes too expensive or its (10) …………. begins to fall short. New firms can easily enter the market, generating additional (11) ………... Companies

earn just enough (12) ………. to stay in business and no more, because if they were to earn excess profits, other companies would enter the market and drive profits back down to the bare minimum.[66]

Task 5. Language in Use

Study the box explaining the rules of modal verbs use. Rewrite the sentences (1-10) using appropriate modal verbs so that they will have similar meaning (10 minutes).

Modal verbs

Modal verbs are usually followed by bare infinitive and don't take suffixes (- s, -ed, -ing). Modal verbs can express a variety of meanings, such as:

1. **Ability**:
*e.g. If one product becomes too expensive, a buyer **can** choose a cheaper substitute instead.*
*We didn`t rise our prices because that **could** lead to decrease of demand.*

2. **Obligation and necessity:**
*e.g. Suppliers **have to** analyze competition before entering the market.*
*We **must** change our price policy to win the larger market part.*
*People **should/ ought to** be careful choosing one product over another.*

3. **Possibility:**
*e.g. A monopoly **may** form when a company has a copyright that prevents others from entering the market*
*The price in a monopolistic market **can** be very high.*
*We **could** have changed the situation in time, but we didn`t.*

4. **Logical assumptions:**
*e.g. As it is Sunday, the banks **must** be closed.*
*Because the market is monopolistic, companies **can`t** enter it easily.*

5. **Advice:**
*e.g. The market is highly competitive. We **should** analyse our strategy before entering it.*

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1. Perhaps the prices will change in the nearest month.
2. I'm sure the CEO has gone on a business trip.
3. Employees are obliged to follow safety rules at the workplace.
4. The company was advised to develop another competitive product line.
5. The bank is able to raise interest rate without customer notification.
6. The guests are supposed to arrive at the conference at 9:00 AM.
7. I'm certain he will not make it at the opening time.

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[66] The text is borrowed and modified from http://www.investopedia.com/terms/p/perfectcompetition.asp as of 10th November 2013.

8. It is necessary for companies to meet the customers` expectations.

9. There is a chance that next year we will enter the foreign market.

10. You are to report to the manager as soon as possible.

Differentiated Activity

Task 6. 🔊 Listening

You are going to watch a video about perfect competition. Choose any part of the task you feel confident to complete or do them all. You have 10 minutes for the task. To watch the video, use the following link: http://www.youtube.com/watch?v=9Hxy-TuX9fs.

Part 1. Look through the following statements and say whether they are true (T) or false (F).

1. Cost curves depend on market structure. ☐
2. There exist a lot of market structures. ☐
3. There is no specific number of suppliers in a perfect competition. ☐
4. In perfect competition, you are free to make decisions without worrying about how the competition will react ☐
5. In perfect competition, suppliers produce different products ☐
6. It is easy to go in and out the market in perfect competition ☐
7. Market power is the ability to control the demand. ☐
8. Each individual firm has market power. ☐

Part 2. Insert the words into the missing gaps.

Cost curves are always going to look the same, but other elements, like price, revenue and (1) ……….. , will differ depending on the (2) ……… structure that the (3) ……….. operates in. There is a continuum of market structures, one of which is perfect (4) ………..

If the market is competitive, how many producers are we talking about? A large number of (5) ………. means there is so many competitors that each one is too small to (6) ……….. the market. Since nothing you do affects the market, you are free to make (7) ………. without worrying about how the competition will (8) …......

Besides having a large (9) ………. of sellers, each of those sellers will be producing exactly the same thing. In perfect competition, the (10) ……… is identical, or homogeneous, or non-differentiated, no matter who produces it.

One more characteristic – it's easy for firms to come and go from the industry, that is, there's free (11) ……… and exit. Also you have no ability to drive the (12)……., because you`re so small, and everyone else produce exactly the same thing that you do.

Part 3. Answer the following questions:

1. What can be changed depending on the market structure?
2. How many producers are there in a competitive market?
3. What is market power?
4. What are the characteristics of a perfect competition?
5. What will happen if you try to raise the price in a competitive market?

Task 7. Tiered Task

Choose and complete any part of the task suggested below. Prepare to report your results to the class. You have 10 minutes for this task.

Part 1. Read the following quotations of the famous businessmen. Analyse them and work out the rules of successful performance under competition. Suggest your own advice on winning in a competitive market.

"Business is not just doing deals; business is having great products, doing great engineering and providing tremendous service to customers. Finally, business is a cobweb of human relationship."

Henry Ross Perot

"In business, the competition will bite you if you keep running. If you stand still, they will swallow you."

Victor Kiam

"If you are not a brand, you are a commodity."

Robert Kiyosaki

"Don't try to be all things to all people. Concentrate on selling something unique that you know there is a need for, offer competitive pricing and good customer service."

Lilian Vernon

"The competitor to be feared is one who never bothers about you at all but goes on making his own business better all the time."

Henry Ford

"Innovation distinguishes between a leader and a follower."

Steve Jobs

Part 2. Read the following small business marketing strategies for overcoming competition.[67] Paraphrase and organize them into a set of rules, so that each rule starts with one of the letters constituting the word 'MARKET'.

- Identify your competitor; spot out the competitor's strengths and weaknesses, and plan your strategy based on the information gathered.

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[67] The text is borrowed and modified from http://www.mytopbusinessideas.com/effective-marketing-strategies/ as of 20th November 2013.

- Find a niche market and serve that niche to the best of your effort. Don't spread your effort, concentrate and don't try to be everything to everyone; be something to someone.

- To outsmart your competitors, you need to be unique. You need to find your strength, work on it and broadcast it to the world.

- Connecting with your customers entails knowing your customer's need and touching them at the point of that need. If you can successfully do this; you have nothing to fear about competition.

- Focus on how to serve the customers more efficiently; your utmost focus should be to give the customer maximum satisfaction. You must insist on quality and make quality a standard in your business. Insistence on quality at an affordable rate can set you apart from competition.

- Be innovative which simply means being willing to try out new products and techniques to improve the value of your offered services.

Part 3. Look at the following chart[68] depicting Supply and Demand Curves. Analyse the chart and answer the questions:

1. What does each curve indicate?
2. What happens when two curves intersect?
3. Is the demand curve directly affected by price changes?
4. Why do the curves have such shapes?

Supply and Demand Curves

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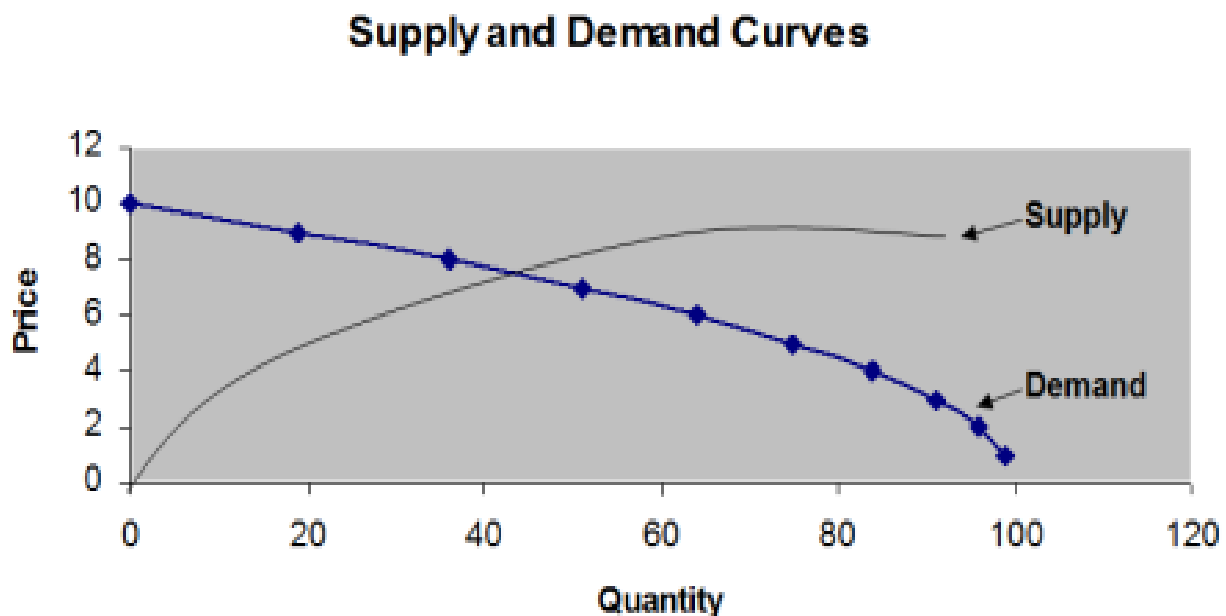
[68] The chart is borrowed from http://www.consumerpsychologist.com/food_Price_and_Competition.html as of November 11th, 2013.

Task 8. Pair work

Act a dialogue between a newcomer employee and a department manager about working conditions. In your dialogue, use modal verbs (turn to Task 5 for help, if necessary). You have 10 minutes for this activity.

Department manager*.* Introduce the newcomer employee to the rules of work at your department. Tell him / her that employees are obliged to come at work at 9:00, follow the safety dress-code rules, and report to their supervisor at the end of working day. Also inform that smoking at workplace is forbidden.

Employee*.* You have come to a new department and are unfamiliar with the working conditions here. After the lead-in of your department manager, ask him whether you are allowed to use a company car and parking facilities, when and for how long you may take a lunch break and whether you can have a day off.

Task 9. Group Work. Role-play

You are the board of directors of one of the suggested below companies. You call a meeting to discuss the strategy of launching a new product line into highly competitive market. Analyse your strengths and weaknesses and propose tactics and overall direction of your strategy. You have time until the end of the class.

Steelbox Corporation. You are the current leader of computer devices industry. You are well-known and have a wide spectrum of devices on the market. You have developed a new tablet to launch in the nearest future. Your product is of high quality and its performance is quick and effective. However, the costs of production and, thus, the price are relatively high. You are concerned about the rising number of competitors on your market and have to develop a strategy to hold your greatest part of the market.

NTS Corporation. You have been in the industry of home appliances for several decades and you certainly have a well-known brand name. However, you are a newcomer in the industry of IT devices and the process of your new tablet introduction may be troublesome. You have to develop a strategy to convince your customers that your company is able to perform well not only in appliances industry.

Small&Nice Company. You are a young developing company with a lot of brand new ideas as to design and functions of popular teenage gadgets. You have

decided to launch your new tablet, which goes in a variety of colours and unique prints. It also has pre-installed popular games and a lot of useful widgets. Develop a strategy on how to survive and make profit on the same market with such giants as NTS and Steelbox.

ABC company. Your company has taken the opportunity to enter the foreign market with your new line of tablets. Your primary aim is to enter the market quickly and make a short-run profit. Although you can offer low priced product, its efficacy and operation is low compared to your competitors` products. Develop a strategy to reach your aims and survive on the foreign and competitive market.

Optional Activity

Task 10. Facilitated Task

Read the text about market structures.[69] Give definitions to the words/ phrases in bold and fill in the table.

In economics, **market structure** describes the state of a market with respect to competition. Most market forms given below talk about a **homogeneous product**. This simply means that they all make the same kind of product (like sugar, or soap), and that the individual consumer does not care where he or she buys from. They simply want to get the cheapest one, since all kinds of product look the same anyway.

The major market forms are:

- **Perfect competition**: there are many firms making a homogeneous product.
- **Oligopoly**: A market is dominated by a small number of firms which own more than 40 % of the market share.
- **Monopoly**: There is only one provider of a product or service.

The correct sequence of the market structure from most to least competitive is: perfect competition, imperfect competition, oligopoly, and pure monopoly.

The main criteria by which one can distinguish between different market structures are: the number and size of **producers** and **consumers** in the market, the type of goods and services being traded, and the degree to which information can flow freely.

Market Structure	Seller Entry Barriers	Seller Number	Buyer Entry Barriers	Buyer Number
Perfect Competition	*No*	*Many*	*No*	*Many*
Oligopoly				
Monopoly				

Task 11. Complex Task

Read the article about Apple-Samsung competition from the "Forbes" magazine. Fill in the table with the data from the article.

	Apple	Samsung
Previously owned mobile phone		
Switch to operation system		
Switch to mobile phone		
Switch from basic or non-feature phone		
Retention rate		

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[69] The text is borrowed and modified from http://simple.wikipedia.org/wiki/Market_forms as of 10th November 2013.

Apple Vs. Samsung: Who Could Win The Smartphone War?

Consumer Intelligence Research Partners (CIRP) conducts a quarterly survey of 500 consumers who have bought a mobile phone in the past three months. It analysed the results over the past four quarters from July 2012 to June 2013 to determine where Apple and Samsung got their customers.

It is reported that 42 % of iPhone owners had owned an iPhone previously while 43 % of Samsung owners had previously owned an Android phone. Apple does a better job of getting Android users to convert to iOS with about 20 % of its customers coming from Android vs. only 7 % of Samsung customers coming from iOS.

Samsung makes up for not getting iOS customers to switch by having 37 % of its customers coming from a basic or non-feature phone while Apple only has 26 % of its customers upgrading from these lower functionality phones.

Not many users switch from Apple to Samsung at only 11 %. This is critical to Apple's long-term survival since Apple users are sticking with iOS and not defecting to Samsung, the biggest Android player by far. Apple is having about one-third of its users coming from Android with a substantial percentage, about 14 % coming from BlackBerry.

Brand loyalty is very important to any manufacturer but is extremely important in the smartphone market due to the quick replacement cycles. Apple has a bit higher retention rate at 42 % vs. 38 % for Samsung. Apple does a better job of switching Samsung customers at 19 % vs. Samsung only converting 7 % of its users from Apple.

Both Apple, at 79 %, and Samsung, at 75 %, users tend to keep their phones between one and three years with Apple turning them over slightly sooner than Samsung owners.

While having higher market share of any given market is not necessarily the best strategy, not having a mid-priced smartphone will hamper Apple's ability to get users into the Apple ecosystem. Since its users have a high likelihood of sticking with Apple, the potential September 10 announcement of a more entry level smartphone could have major long-term benefits for Apple.

Apple could be in a better position since it seems to be retaining a higher percentage of its users and doing a better job of getting Android users to convert to iOS. While it is not expected that Samsung will falter anytime soon, if the Android market becomes extremely price competitive and it is not able to make inroads in Apple's install base Samsung's profitability could be negatively impacted. Samsung will need to be at the leading edge of functionality and develop its own ecosystem.[70]

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[70] The text is borrowed and modified from http://www.forbes.com/sites/chuckjones/2013/08/20/apple-and-samsung-who-could-win-the-smartphone-war/ as of 21st November 2013.

Lesson 16

Whole-Class Activity

Task 12. Do or check Tasks 1-2 in your Workbook (10 minutes).

Task 13. Report the results of your Internet search. Ask each other questions related to the topic of your report (10 minutes).

Task 14. Discuss the following questions for 5 minutes. Turn to the help box if necessary:

1. What is a report?
2. What are the common spheres of use of a report?
3. What is the aim of a report?
4. Who is the target audience of a report?
5. What are the necessary parts of a report?
6. What is the required length of a report?
7. What are the common characteristics of a report?

A **report** is any informational work made with the specific intention of relaying information or recounting certain events in a widely presentable form.

Written reports are documents which present focused content to a specific audience. Reports are often used to display the result of an experiment, investigation, or inquiry. The audience may be public or private. Reports are used in government, business, education, science, and other fields.

The following common elements can be found in many different reports:

- Title page
- Contents
- Introduction
- Methodology
- Results or findings
- Conclusion and recommendation

Task 15. Report: Writing Techniques

Read the article about writing a report. Choose the appropriate headings to each paragraph thus creating a list of tips for effective report writing (15 minutes).

A. Gathering and selecting information
B. Analysing your material
C. Reviewing and redrafting

D. Understanding the purpose
E. Writing the report
F. Organizing your material

Writing the Report: the Essential Stages

All reports need to be clear, concise and well structured. The key to writing an effective report is to allocate time for planning and preparation. With careful planning, the writing of a report will be made much easier. The essential stages of successful report writing are described below.

Stage One _____

This first stage is the most important. You need to be confident that you understand the purpose of your report. Consider who the report is for and why it is being written. Check that you understand all the instructions or requirements.

Stage Two _____

Once you are clear about the purpose of your report, you need to begin to gather relevant information. Your information may come from a variety of sources, but how much information you will need will depend on how much detail is required in the report. As you read and gather information you need to assess its relevance to your report and select accordingly.

Stage Three _____

Decide what information will be included and in what sequence it should be presented. Begin by grouping together points that are related and form sections or chapters. Choose an order for your material that is logical and easy to follow.

Stage Four _____

Take time to consider and make notes on the points you will make using the facts and evidence you have gathered. What conclusions can be drawn from the material? It is not enough to simply present the information you have gathered; you must relate it to the problem or issue described in the report brief.

Stage Five _____

Having organized your material into appropriate sections and headings you can begin to write the first draft of your report. Aim for a writing style that is direct and precise. Make your points clearly and concisely. Chapters, sections and even individual paragraphs should be written with a clear structure.

- **Introduce** the main idea of the chapter/section/paragraph
- **Explain** and expand the idea, defining any key terms.
- **Present** relevant evidence to support your point(s).
- **Comment** on each piece of evidence showing how it relates to your point(s).
- **Conclude** your chapter/section/paragraph by either showing its significance to the report as a whole or making a link to the next chapter/section/paragraph.

Stage Six _____

Be prepared to rearrange or rewrite sections in the light of your review. Try to read the draft from the perspective of the reader. Is it easy to follow with a clear structure that makes sense? Are the points concisely but clearly explained and supported by relevant evidence? Keep reviewing until you are satisfied with the content and structure of your report.[71]

Task 16. Analyse the following sample of a report and decide which titles can be chosen to fill the gaps (5 minutes).

1. Sources of information.
2. Results of investigation.
3. Procedures.
4. Recommendations.
5. Introduction

Survey of Overseas Students at Smartfield University[72]

University Survey Committee, 10th December, 2014

1. _____

The main purpose of the study is to explore ways of attracting more overseas students to study at Smartfield University. An additional purpose is to help to make the existing environment more conductive to study for these students.

2. _____

Our major source of information about the needs and wishes of overseas students at Smartfield University is a questionnaire, aimed at eliciting relevant information from overseas students who have studied here since 2000.

A total of 300 responses were received, 296 of which were usable. Four hundred and seventy two students had been enrolled at Smartfield University during the period in question. The responses, therefore, can be taken to reflect the views of a significant majority of these students.

3. _____

Students were asked if they had received thorough, partial or no information about the university, their chosen program of study, local culture, and travel and visa matters. Results suggest that insufficient information on local culture and traditions was provided to students before

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[71] The text is borrowed and modified from http://www2.le.ac.uk/offices/ld/resources/writing/writing-resources/reports as of 28th November 2013.

[72] The text is borrowed and modified from http://www.ryerson.ca/content/dam/studentservices/els/pdf/MODULE%20Acadamic%20Report.pdf as of 28th November 2013.

they arrived here. In addition, some departments apparently sent information sheets that were insufficient, incomplete or unclear.

Using a scale of dissatisfied, satisfied, or very satisfied, students were also asked to rate five different aspects of their arrival in the country and at the university. Some responses suggest that local food and campus orientation seem to require improvement.

4. _____

This survey of overseas students at Smartfield University over last 13 years show why out university continues to be a popular place of study for students from many countries. However, two main concerns have been highlighted by the survey:

- In some cases, inadequate or erroneous information has been sent to overseas students prior to their arrival at Smartfield University.
- Problems with housing and cuisine have been noted

5. _____

Based on the survey results, the committee makes the following recommendations:
The university should provide information on local culture and traditions as part of the mailing to overseas applicants.

It should identify departments whose departmental brochures and flyers are in need of updating or expansion.

Task 17. Look at the following list of common expressions which may be found in reports. Decide in which part of a report they may be used and insert each into appropriate column of the below given table (10 minutes).

The aim of … is to …, was collected, …was asked to submit …, it is recommended that…, will outline, was to determine …, carry out (a research, a task etc.), the purpose of … is to …, was used, was requested by, was undertaken, responses were identified, as requested by, should be done, was instructed, before (date), was asked, make appropriate recommendations, by (date), should be done, on (date), with discussions, obtain, the following recommendations…, were surveyed, make questionnaires, should be undertaken.

Aim of investigation	Who requested the report	When the report was requested	Methodology used	Recommendations
The aim of …is to…				

Differentiated Activity

Task 18. Tiered Task

Read the assignments and complete at least one part of the task. You have 10 minutes for this task.

Part 1. Although reports may be lengthy and cover different points of the subject in question, they need to have a clear structure. Organize the following ideas into a list with headings and sub-headings. The list will become the contents page for a report about strategies for implementing Internet technologies in the school study.

Speaking   *Scope*
Aim   *Introduction*
Background   *Methodology*
History of Internet Use in School   *Current State of Internet Implementation*
Listening   *Recommendations*
Content   *Learning Activities*
Conclusions   *Historical Background*
Pedagogical Approach   *Learning Objectives*

Part 2. Linking your ideas is important in writing a report. Use of linking words and expressions will help to build coherent and understandable text. Study the following table of most commonly used linking means. After doing so, insert the appropriate words into the suggested report paragraphs.

To Add or Strengthen	To Express Cause and Effect	To Express Order of Actions	To Contrast	To Clarify
additionally	as a result	first	but	for example
also	due to	next	however	for instance
besides	therefore	finally	on the contrary	in other words
indeed	consequently	before	on the other hand	that is
moreover	so	after	yet	namely
what is more	as	meanwhile	although	thus

A. In recent years, the Internet has become a teaching tool as useful as textbooks, chalk boards and, (1) ………. teachers themselves. (2) ………., as is the case with any medium, online resources have a range of advantages and disadvantages. (3) …………. it is necessary to carefully examine and evaluate web-based resources before choosing to use them.

B. The report evaluates the on-line resource, focusing on three key factors, (4) ……….. content, pedagogical approach, and practical considerations. (5) ………… the website is divided into several sections, the paper focuses on listening and speaking activities. The material was selected (6) ………… of collaboration between the author and several linguistic teachers.

C. (7) …… the web-based material has its limitations, the activities are educational. The material is user-friendly, even for first-time internet users. The learner can easily return to the main menu (8) …….. the text-based navigation tools are always displayed. (9) …….. the simple and consistent format of the web page the teacher can easily navigate the learners through the web page. The content is American based; (10) ……. it can be implemented into any language classroom.

Part 3. A well-written report should demonstrate the information in logical and clear way. That is why it is important to understand what kind of data may be included into separate paragraphs. Read the following typical report structure and create a list of questions which should be answered in each paragraph.

1. Title
2. Introduction
3. Methodology
4. Results of Findings
5. Conclusions
6. Recommendations

Task 19. Pair work

Look at the following list of report features.[73] Decide which of them belong to good and bad writing techniques. In pairs, justify your opinion and propose other characteristics of a good e-mail (10 minutes).

GOOD WRITING BAD WRITING

- proper use of subheadings;
- the inclusion of inaccurate or conflicting information;
- use of outdated or irrelevant data;

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[73] The text is borrowed and modified from http://www.canberra.edu.au/studyskills/writing/reports as of 28th November 2013.

- appropriate header and footer of a page;
- facts and opinions which are not separated and used altogether;
- use of clear and correct information;
- use of informal style of writing;
- use of stylized fonts;
- use of consistent and appropriate formatting;
- use of tables and figures (graphs, illustrations, charts etc);
- separation of parts of the report so that they stand out clearly;
- unsupported conclusions and recommendations;
- use of dot points/ numbers/ letters to separate elements;
- careless presentation and proof-reading;
- formal language;
- too much emphasis on appearance and not enough attention to the content.

Task 20. Group work

You are the team of Research Department at IT company. You have received a chart depicting the operating income of Microsoft Corporation.[74] Your task is to analyse the chart and create a report on Microsoft operation in 2006-2012. Inside your group, divide responsibilities so that each member is responsible for separate report paragraph. Create and present your report to the rest of the class. You have time until the end of a class.

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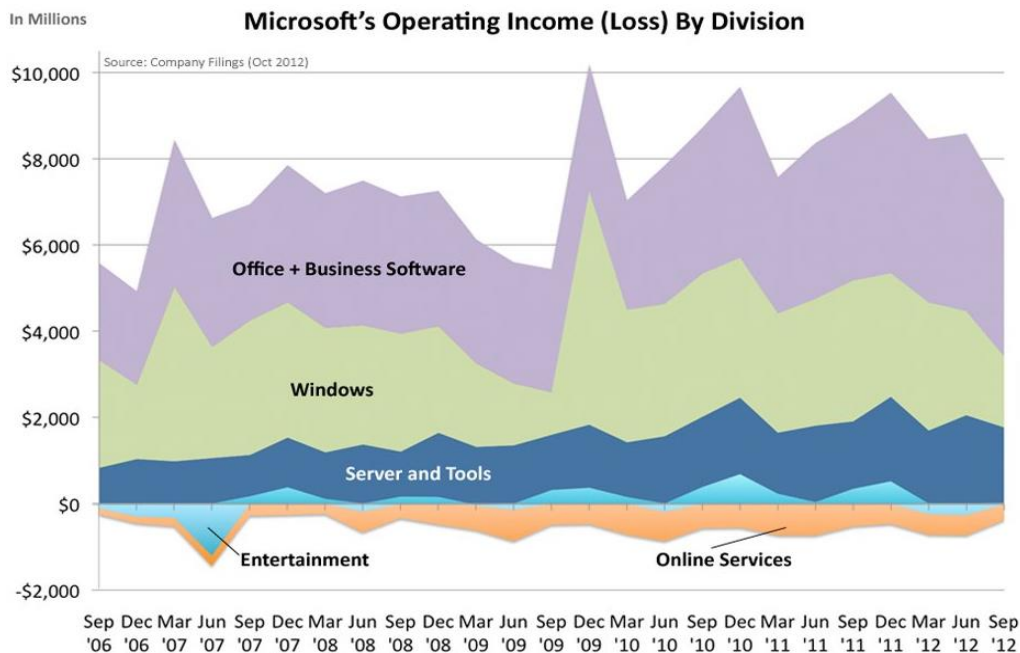
[74] The chart is borrowed from http://www.businessinsider.com/chart-of-the-day-microsoft-income-by-segment-2012-10 as of 18th November 2013.

Optional Activity

Task 21. Facilitated Task

Look at the following report.[75] Some sentences have been removed from their places. Put the appropriate sentences from the right column into the gaps. Find and identify the constituent parts of a report:

<table>
<tr>
<td>

Evaluating the Effectiveness of Technology in Our Schools

Richard J. Noeth
Boris B. Volkov

(1) _____

Computers and information technologies have visibly revolutionized nearly every aspect of daily life – how and where we get our news, how we order goods and services, and how we communicate.

(2) _____This report is intended for use by educational leaders and policymakers who are concerned with making optimal use of technology in the schools.

(3)_____

The rapid growth of school technology infrastructure has led to the increased availability and use of computers in schools.

(4) _____

But while they may have abundant computers, schools may not use them in the best ways to enhance learning. The important issue in effectiveness for learning is not the sophistication of the technologies, but the ways in which their capabilities aid and motivate users.

(5) _____

Summarizing the reviews of research on computers and education, the results indicate that, while not all reviews show outcomes in favour of computer use, the vast majority reach positive conclusions about their efficacy.

</td>
<td>

A. When combined with traditional instruction, the use of computers can increase student learning in the traditional curriculum and basic skills areas.

B. Most students now have access to computers and the Internet in their classrooms, nearly all students have access somewhere in their schools, and a majority of teachers report using computers or the Internet for instructional purposes.

C. While information is accruing, available evidence indicates that technology generally has demonstrated positive but limited results on improving the educational achievement of all students.

D. This report provides useful information and specific recommendations about evaluating the effectiveness of technological applications implemented to enhance teaching, learning, and achievement.

</td>
</tr>
</table>

---

[75] The text is borrowed and modified from http://www.act.org/research/policymakers/pdf/school_tech.pdf as of 26th November 2013.

(6) _____Students learn more quickly and with greater retention when learning with the aid of computers. **(7)**_____ The issues involved in evaluating the effectiveness of technology in education are complex. *Yet technology as a primary educational tool and major school expenditure must be held accountable to its promise of enhancing teaching, learning, and achievement.* (8) _____Clearly, more information of a more rigorous nature is needed.	E. TECHNOLOGY IN OUR SCHOOLS F. INTRODUCTION G. RECOMMENDATIONS H. EVALUATING EFFECTIVENESS OF TECHNOLOGY AS AN INSTRUCTIONAL TOOL

Task 22. Complex Task

Read the report from Task 21. Rewrite the words in italics so that they will contain linking words or phrases from Task 18.

Task 23. Complex Task

Read the article from Task 11 and prepare a report on Apple-Samsung competition.

MODULE 3 TEST. ECONOMICAL SYSTEMS

1. An 'enterprise' is involved in trading:

a) influence   b) sevrices   c) consumers   d) reputation

2. A 'Sole Proprietor' is always owned by:

a) government   b) international entity   c) a single person   d) multiple individuals

3. A 'Corporation' doesn't have:

a) shareholders   b) boards of directors   c) liability shared with the owner   d) employees

4. Real estate businesses don't …………. buildings:

a) demolish   b) rent   c) develop   d) sell

5. Information businesses do not deal with:

a) raw materials   b) intellectual property   c) movies   d) software

6. Transportation businesses deliver:

a) individuals and news   b) contracts and goods   c) goods and news   d) goods and individuals

7. Organizational structure does necessarily not involve:

a) logistics department   b) product marketing   c) research and development   d) human resources

8. Consumers …………. goods and services:

a) send   b) purchase   c) provide   d) refund

9. An employer …………… workers:

a) buys   b) obtains   c) receives   d) hires

10. Employees don't receive:

a) reputation   b) salary   c) refund   d) experience

11. A business letter is:

a) confidential   b) informal   c) always   d) always short
                                          digital

12. The necessary components of a business letter do not include:

a) personal   b) main text   c) date   d) signature
opinions

13. A business letter is not used to:

a) influence   b) communicate   c) advertise   d) inquire about
                    an idea   non-business
                                                               activities

14. A business letter should:

a) be lengthy   b) contain big   c) be impactful   d) impressive
                     sentences   with writing
                                                                   skills

15. A business letter should omit:

a) personalized   b) salutation   c) complimentary   d) writer's
remarks   close   address

16. A letter of complaint doesn't need to be:

a) polite   b) highly   c) intimidating   d) constructive
                 qualified

17. Banks don't:

a) pay   b) perform   c) run   d) maintain
employees   retail services   businesses   bank buildings

18. Banks don't make money by:

a) selling clients' information

b) charging interest on money that they lend

c) charging fees for services they provide

d) trading financial instruments in the financial markets

19. To encourage people to keep their money in a bank, the bank will:

a) endorse new services	b) pay interest	c) use advertisement	d) offer shares of the bank

20. A small amount of money paid to the customer by the bank for keeping his money there is called:

a) fee	b) percent	c) interest	d) incentive

21. The rate of money lent to the rate of deposit is:

a) irrelevant	b) equal	c) lower	d) higher

22. Lending money by the bank can't take the forms of:

a) overdrafts	b) favours	c) mortgages	d) loans

23. The services that banks do not provide include:

a) processing cheques

b) unauthorized borrowing e.g. if a client exceeds an overdraft limit

c) booking tickets

d) currency exchange

24. Mortgage Banks:

a) specialize in loans for estate

b) collect money from people in various sectors and gives it as a loan to businessmen

c) are not for the general public or community

d) are suited for employees with a monthly salary

25. Investment Banks:

a) promote everything across all countries around the globe

b) provide banking facilities only via internet

c) specialize in large organization's investments across the industry

d) are managed and run by the government

MODULE 4. MATHEMATICAL SYSTEMS

At the end of this module Students will know:

➢ the notions of Arithmetic, Number Theory and Discrete Mathematics;

➢ kinds of Arithmetic operations and their precedence;

➢ fields of Discrete Mathematics study;

➢ the notion of a theorem and types of proofs.

At the end of this module Students will understand:

➢ the way Arithmetic and Discrete Mathematics relate to professional spheres;

➢ how Arithmetic and Discrete Mathematic can be applied in solving practical tasks;

➢ how to comment actions when solving equations and proving theorems .

At the end of this module Students will be able to:

➢ express calculations when solving equations;

➢ use conditional sentences in theorem proofs;

➢ write mathematical papers, such as proofs, solutions and abstracts.

Unit 9. Arithmetic and Number Theory

Lesson 17

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about Arithmetic. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. What is Arithmetic?
2. When and where did Arithmetic emerge as a branch of science?
3. What are the common arithmetic operations?

Practical Concern

1. What are the common applications of Arithmetic?
2. What was the first purpose of calculations?
3. In what professions is Arithmetic usually used?

Analytical Concern

1. What role does Arithmetic play in the analysis?
2. What arithmetic operations are most often used in business?
3. What are the applications of Number Theory?

Creative Concern

1. What interesting applications of Arithmetic do you know?
2. How is Arithmetic shown in literature?
3. How do you understand the phrase "Arithmetic of Art"?

Task 2. Reading

Read the text about Arithmetic and Number Theory. Choose the titles (A-E) to the paragraphs (1-5). You have 20 minutes for this activity.

A. Applications
B. Definition
C. Number Theory

D. Integers
E. Arithmetic Operations

Queen of Math[76]

1	

Arithmetic or **arithmetics** (from the Greek word *arithmos* "number") is the oldest and the most elementary branch of mathematics, used very popularly for tasks ranging from simple day-to-day counting to advanced science and business calculations. It involves the study of quantity, especially as the result of operations that combine numbers. In common usage, it refers to the simpler properties when using the traditional operations of addition, subtraction, multiplication and division with smaller values of numbers. Professional mathematicians sometimes use the term arithmetic when referring to more advanced results related to number theory, but this should not be confused with elementary arithmetic.

2	
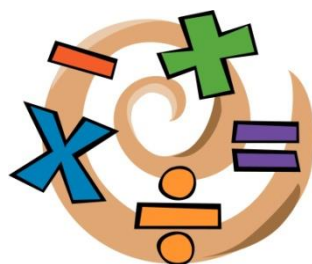
The basic arithmetic operations are addition, subtraction, multiplication and division, although this subject also includes more advanced operations, such as manipulations of percentages, square roots, exponentiation, and logarithmic functions. Arithmetic is performed according to an order of operations. Any set of objects upon which all four arithmetic operations (except division by 0) can be performed, and where these four operations obey the usual laws, is called a field.

3	

The term arithmetic also refers to number theory. Number theory (or arithmetic) is a branch of pure mathematics devoted primarily to the study of the integers, sometimes called "The Queen of Mathematics" because of its foundational place in the discipline. Number theorists study prime numbers as well as the properties of objects made out of integers (e.g., rational numbers) or defined as generalizations of the integers (e.g., algebraic integers).

4	

Integers can be considered either in themselves or as solutions to equations. Questions in number theory are often best understood through the study of analytical objects that encode properties of the integers, primes or other number-theoretic objects in some fashion (analytic number theory). One may also study real numbers in relation to rational numbers, e.g., as approximated by the latter.

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[76] The text is borrowed and modified from http://en.wikipedia.org/wiki/Arithmetic as of 21st December 2013.

5	

The number-theorist Leonard Dickson said "Thank God that number theory is unsullied by any application". Such a view is no longer applicable to number theory. In 1974 Donald Knuth said "...virtually every theorem in elementary number theory arises in a natural, motivated way in connection with the problem of making computers do high-speed numerical calculations". Elementary number theory is taught in discrete mathematics courses for computer scientists, and on the other hand number theory also has applications to the continuous in numerical analysis. As well as the well-known applications to cryptography, there are also applications to many other areas of mathematics.

Task 3. Vocabulary Practice

Match the words (1-7) with their definitions (a-g). You have 5 minutes for this task.

1. Addition	a) a mathematical operation that represents the operation of removing objects from a collection
2. Subtraction	b) splitting into equal parts or groups
3. Multiplication	c) a mathematical operation that represents the total amount of objects together in a collection
4. Division	d) a number which produces a specified quantity when multiplied by itself
5. Square Root	e) a quantity representing the power to which a fixed number (the base) must be raised to produce a given number
6. Exponentiation	f) the operation of raising one quantity to the power of another
7. Logarithm	g) an operation that, for positive integers, consists of adding a number (the multiplicand) to itself a certain number of times

Task 4. Vocabulary Practice

Fill in the gaps with the words in bold. You have 10 minutes to complete this task.

expression   **exponents**   **parts**   **order**   **change**

185

addition   precedence   multiplication   right   brackets

In mathematics and computer programming, the (1) .... of operations (sometimes called operator (2) ....) is a rule used to clarify which procedures should be performed first in a given mathematical (3) ....

Since the introduction of modern algebraic notation, (4) .... has taken precedence over addition. When exponents were first introduced in the 16th and 17th centuries, (5) .... took precedence over both addition and multiplication and could be placed only as a superscript to the (6) .... of their base. To (7) .... the order of operations, originally a vinculum (an overline or underline) was used. Today, parentheses or (8) .... are used to explicitly denote precedence by grouping (9) .... of an expression that should be evaluated first. Thus, to force (10) .... to precede multiplication, we write $(2 + 3) \times 4 = 20$, and to force addition to precede exponentiation, we write $(3 + 5)^2 = 64$.[77]

Task 5. Language in Use

The ability to express common mathematical operations may come in use in many professions. However, mathematicians and theoretical analysts don't restrict themselves to simple 'pluses' and 'minuses'. Study the box explaining the ways of expressing calculations. After that, match the numbers in columns with arithmetic operations to create equations. Make up sentences to express the calculations. You have 10 minutes for this task.

Expressing Calculations

We can express mathematical calculations in many ways. Here are the most often used expressions to denote the basic arithmetic operations:
1. To express addition, we use words **"add", "plus", "sum", "total", "increase":**
   e.g. Two plus two makes four.
   The sum of seven and three is ten.
2. To express subtraction, we use **"subtract", "minus", "less", "difference", "take away", "decrease", "deduct"**:
   e.g. Six minus two makes four.
   Fourteen take away six is equal to eight.
3. We can express multiplication using **"multiply", "by", "times", "lots of"**:
   e.g. Three lots of five is fifteen.

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[77] The text is borrowed and modified from http://en.wikipedia.org/wiki/Order_of_operations as of 21st December 2013.

Nine times seven is 63.
4. To express division, we may use such words as **"divide", "go into", "quotient"**:
e.g. 22 divided by 5 is 4, with 2 left over.
The quotient of 40 by 5 is 8.

e.g. Two by four is eight. Nine minus one is eight.

2		1		8
30	×	2		5
4	÷	3		11
55	+	4	=	54
6	-	5		12
63		6		21
9		7		14

Differentiated Activity

Task 6. Group activity

In groups, work out topical content of the following extract. Report your findings to the class. You have 10 minutes for this task.

Algebra and Number Theory have always been **counted** among the most beautiful mathematical **areas** with deep proofs and elegant results. However, for a long time they were not considered that **important** in view of the lack of real-life **applications**. This has dramatically **changed** with the appearance of new topics such as modern cryptography, coding theory, and wireless communication. Computational and applied mathematics depending on **deep** algebraic and number theoretic methods have become **crucial** for these and other topics of extremely high current interest. Nowadays we find applications of algebra and number theory **frequently** in our **daily** life. We mention security and error detection for internet banking, check digit systems as the bar code on **products** in a supermarket, GPS and radar, pricing options at a stock market, and eliminating noise for mobile phones as examples.[78]

Group 1. Read the extract and create a scheme which represents the spheres of use of Algebra and Number Theory.
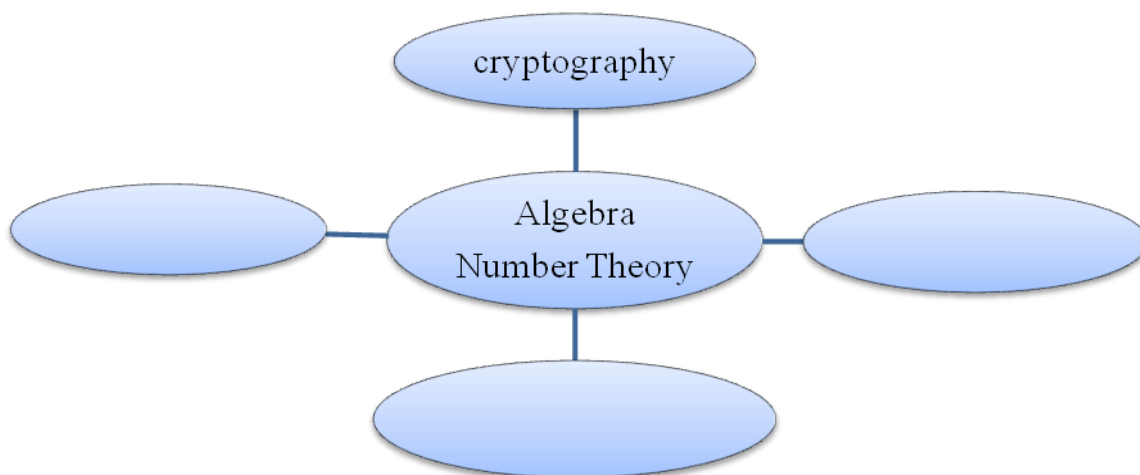
Group 2. Broaden your vocabulary by suggesting synonyms / antonyms to the words in bold.

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[78] The text is borrowed and modified from http://www.ricam.oeaw.ac.at/specsem/specsem2013/ as of 26th December 2013.

Group 3. Inside your group, discuss other possible spheres of use of Algebra and Number Theory. Explain, how the knowledge of Algebra can be applied in practice.

Task 7. 🔊 Listening

You are going to watch a video about solving linear equations. Choose any part of the task you feel confident to complete or do them all. You have 10 minutes for the task. To watch the video, use the following link: http://www.youtube.com/watch?v=wShnYemIr28

Part 1. Answer the questions:

1. Solving what kind of equations is explained in the video?
2. What should be done in the first place to solve such kind of linear equation?
3. What linear equation is given as an example?
4. What is the answer to this equation?

Part 2. Complete the sentences:

1. The first thing to do when solving equations with variables on both sides is to… .
2. The easiest way to avoid negatives when possible is to … .
3. It's really important to always remember to … .
4. When the variables are on one side, follow the same steps that you follow to ...
5. Always remember to … .

Part 3. Write down the equation which was given as an example. Solve it and give your comments to each stage.

Task 8. Pair work

Using the help box from Task 5, give each other quick tasks to perform basic arithmetic calculations. You may also ask each other to explain the solution of a linear equation. Answer questions as quick as possible. You have 5 minutes for this task.

e.g. *Student A. How much is five by seven?*
Student B. Five by seven makes thirty five.

Task 9. Team Work: Brain Ring

You are going to be divided into three teams. Choose your team name and the captain. The Brain Ring competition consists of two parts:

1. You have to solve and explain the solution of one of the suggested puzzles.[79]

2. You have to prepare the arithmetic puzzle to the rival team and solve theirs.

The team which does both parts of the Brain Ring correctly, wins.

Puzzle 1.

An old man goes to a bank with a check of $200 and asks the cashier "Give me some one-dollar bills, ten times as many twos and the balance in fives!".
What will the cashier do?

Puzzle 2.

How much does the baby weigh if the mother weighs 100 pounds more than the combined weight of the baby and the dog, and the dog weighs 60 percent less than the baby?

Puzzle 3.

The five school children in couples weigh 129 pounds, 125 pounds, 124 pounds, 123 pounds, 122 pounds, 121 pounds, 120 pound, 118 pounds, 116 pounds and 114 pounds on a weighing machine. What was the weight of each one of the five little girls if taken separately?

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[79] The puzzles are borrowed from http://www.mathsisfun.com/puzzles/sam-loyd-puzzles-index.html as of 30th December 2013.

Optional Activity

Task 10. Facilitated Task

a) Read the extract and try to explain the meaning of the words in bold.

b) Make up sentences with the words in bold.

Arithmetic is the oldest and branch of mathematics which is used very popularly. The four basic arithmetic operations are **addition, subtraction, multiplication, and division**. These are the first two natural hyperoperations and their inverses.

Harder arithmetic includes working with signed numbers, **fractions**, and decimals, and taking **powers** and **roots**. Arithmetic is performed according to an **order of operations**.

The term arithmetic also refers to **number theory**. Number theory is a branch of pure mathematics devoted to the study of the **integers**. Number theorists study prime numbers as well as the properties of objects made out of integers. Elementary number theory is taught in **discrete mathematics** courses for computer scientists. Number theory also has applications to numerical analysis, **cryptography** and many other areas of mathematics.[80]

Task 11. Complex Task

Read the article from "Forbes" magazine about Math myopia. Try to explain the meaning of the words in bold. Formulate the problem which the article deals with. State two approaches to the problem mentioned by the author. Which conclusion does the author draw?

Math Myopia

"Ambition, Distraction, Uglification, and Derision" is how Lewis Carroll referred to addition, subtraction, multiplication and division. Although most people **resonate with this repugnance toward computation**, most would also grant its frequent necessity.

This tension underlies the latest **skirmish in the simmering Math War**. The issue is the proper place of computation and algorithms (step-by-step procedures) in the school curriculum. What, in particular, is their relation to such often neglected skills as understanding graphs, interpreting probability, modelling

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[80] The text is borrowed and modified from http://en.wikipedia.org/wiki/Arithmetic as of 29th December 2013.

situations, applying mathematical concepts in other domains or estimating and comparing magnitudes?

Textbooks and curriculums that attempt **to foster the skills** mentioned above have been criticized as insufficiently rigorous. When the Department of Education endorsed some of these new curriculums as "exemplary," a group of prominent mathematicians published a letter to Education Secretary claiming that many of the recommended books and programs neglect basic algorithms.

This might seem a **parochial controversy** were it not for the social cost of our arithmetical failings – clerks who are perplexed by discounts and sales taxes, medical personnel who have difficulty reckoning correct dosages, quality control managers who don't understand simple statistics, voters who can't recognize trade-offs between contrary desiderata and journalists who are sometimes oblivious to serious risks but apoplectic over trivial ones.

Although there is no real opposition between understanding concepts and mastering algorithms, extreme positions are easy to parody. Assigning 500 long-division problems to elementary school students is **a sure way to stultify them**. So is requiring older students to factor 500 polynomials in algebra class or to differentiate 500 functions in calculus class.

On the other hand, the reformist endeavour to tell stories, describe applications, play games and naturally embed mathematical insights and ideas into everyday life can also be mocked. **A mere glimmer of the idea** generally isn't sufficient to secure numerical answers.

The proper balance depends on the student's age and background, and the specific algorithm. **There is no royal road to mathematical education**, certainly not one capable of being reduced to a column. Despite common belief, arithmetic is not easy; nor are "higher-level" subjects necessarily difficult. Some "elementary" algorithms, such as those for dealing with fractions, may be **drudgery** if they are not presented well, but they are mathematically significant and essential to real understanding. No stories about combining parts of pies or salaries, for example, can replace the formal rules for finding $2/7 + 3/11$.

We should no more be teaching our children to try to compete with \$5 calculators than we should be training them **to dig ditches with hand shovels**. In arithmetic the stories and applications should set the stage and provide motivation for understanding the algorithms. The many good people on opposite sides of the Math War should **recompute their strategies**.[81]

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[81] The text is borrowed and modified from http://www.forbes.com/forbes/2000/0124/6502036a.html as of 29th December 2013.

Lesson 18

Whole-Class Activity

Task 12. Do or check Tasks 1-2 in your Workbook (10 minutes).

Task 13. Work in pairs. Be ready to report the results of your Internet search. Ask each other questions about famous mathematicians (10 minutes).

Task 14. Discuss the following questions for 5 minutes. Turn to the help box if necessary:

1. What is a theorem?
2. How important are theorems in science?
3. What is the aim of a theorem?
4. In what spheres are theorems often used?
5. What is the proof of a theorem?
6. How should the proof of a theorem be presented?
7. What are the two ways of expressing the proofs?
8. What are the benefits of explicit arguments?

Task 15. Look through the following proofs of the theorem.[82] Guess which theorem is proved and answer the questions. You have 5 minutes for this task.

In mathematics, a **theorem** is a statement that has been proven on the basis of previously established statements, such as other theorems – and generally accepted statements, such as axioms.

The **proof of a mathematical theorem** is a logical argument for the theorem statement given in accord with the rules of a deductive system. The proof of a theorem is often interpreted as justification of the truth of the theorem statement.

Although they can be written in a completely symbolic form, for example, within the propositional calculus, theorems are often expressed in a natural language such as English. The same is true of proofs, which are often expressed as logically organized and clearly worded informal arguments, intended to convince readers of the truth of the statement of the theorem beyond any doubt, and from which a formal symbolic proof can in principle be constructed. Such arguments are typically easier to check than purely symbolic ones – indeed, many mathematicians would express a preference for a proof that not only demonstrates the validity of a theorem, but also explains in some way *why* it is obviously true.

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[82] The text is borrowed and modified from http://en.wikipedia.org/wiki/Pythagorean_theorem as of 29th December 2013.

- What structure does the proof have?
- What linking words are used to express logical sequence?
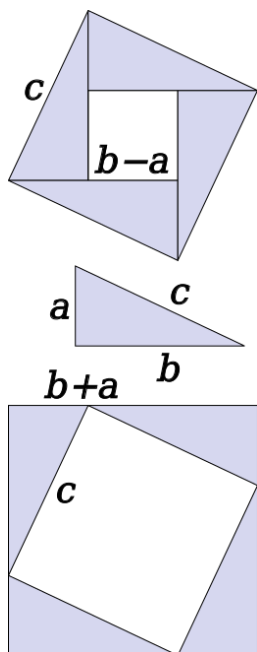
Variant 1. The theorem can be proved algebraically using four copies of a right triangle with sides a, b and c, arranged inside a square with side c as in the top half of the diagram. The triangles are similar with area $\frac{1}{2}ab$, while the small square has side $b - a$ and area $(b - a)^2$. The area of the large square is therefore

$$(b-a)^2 + 4\frac{ab}{2} = (b-a)^2 + 2ab = a^2 + b^2.$$

But this is a square with side c and area c^2, so

$$c^2 = a^2 + b^2.$$

Variant 2. A similar proof uses four copies of the same triangle arranged symmetrically around a square with side c, as shown in the lower part of the diagram. This results in a larger square, with side $a + b$ and area $(a + b)^2$. The four triangles and the square side c must have the same area as the larger square,

$$(b+a)^2 = c^2 + 4\frac{ab}{2} = c^2 + 2ab.$$

giving

$$c^2 = (b+a)^2 - 2ab = a^2 + b^2.$$

Task 16. Mathematical Writing Techniques

Read the text about writing applied in Mathematics.[83] Decide which steps of writing you find the most or the least important and why (15 minutes).

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[83] The text is borrowed and modified from http://www.math.uh.edu/~tomforde/MathWriting.pdf as of 23d December 2013.

MATHEMATICAL WRITING: A BRIEF GUIDE

Writing is a significant and essential part of being a mathematician, and anyone who enters the profession will find their time occupied with the writing of mathematics papers, grant proposals, letters of recommendation, referee reports, and a variety of other items. It is often in graduate school that one first does substantial mathematical writing in the form of papers, a thesis, a research statement for job applications, and possibly also proposals for fellowships or grants. Writing mathematics well is a skill that takes time and practice to learn, and the following list is meant to provide the beginner with aspects of style to consider, conventions to be aware of, and common pitfalls to avoid.

1. Do not use common blackboard abbreviations. For example, write "if and only if" rather than "iff", and "without loss of generality" rather than "WLOG".

2. Punctuate equations and mathematical symbols. Mathematical expressions are no different than the words they represent, and they should be punctuated accordingly. This applies even to displayed equations so that, for example, if a displayed equation is at the end of a sentence it should end with a period.

3. Do not use contractions in formal writing. Thus words such as "don't","can't", "I'm", and "we've" should be written out.

4. Use the first person plural when writing mathematics papers. It is a convention in the mathematical community to use the first person plural, or "we", when writing papers.

5. Write all necessary hypotheses in statements of theorems. If at all possible, make the statements of your theorems completely self-contained so that the reader does not have to look throughout your paper to decipher notation or find definitions of special terminology.

6. Use Latin abbreviations correctly. The following table summarizes the meanings of some commonly used Latin abbreviations:

Abbreviation	Latin term	English translation
i.e.	id est	that is
e.g.	exempli gratia	for example
cf.	Confer	compare
n.b.	nota bene	note well (or just note)
q.v.	quod vide	which see
viz.	Videlicet	namely
et al.	et alii	and others

In particular, the abbreviations i.e. and e.g. are often mistakenly interchanged, and cf. is often misused to mean "see" when it actually means

"compare". Also note that there is no period after "et" since it is not an abbreviation.

7. Do not start a sentence with a variable or symbol. Although it is perhaps technically correct, it is considered bad style to do so. Usually this can be avoided by simply rewording the sentence; e.g., rather than "n points are on the interior" one would write "The interior contains n points". (There are, of course, some exceptions to this rule. In particular, most people would consider it acceptable to start a sentence with a mathematical term that contains a symbol, especially if it is an uppercase symbol. For example, one should feel free to start a sentence with the word C -algebra or the word K-theory.

Task 17. Read the following proof of a theorem. The linking words have been removed from the text. Insert the words to restore the logical sequence of the proof (5 minutes).

Hence (x2)	gives	Since (x2)	yields
then	conclude	Assume	However
So	implies	Therefore	

Theorem: The square root of 2 is irrational, $\sqrt{2} \notin \square$

Proof:

(1) .... for the sake of contradiction that $\sqrt{2} \notin \square$. (2) .... $\sqrt{2} = \dfrac{a}{b}$ holds for some a and b that are coprime.

This (3) .... that $2 = \dfrac{a^2}{b^2}$. Rewriting this (4) .... $2b^2 = a^2$.

(5) .... the left-hand side of the equation is divisible by 2, (6) .... so must the right-hand side, i.e., $2 \mid a$. (7) .... 2 is prime, we must have that $2 \mid a$.

(8) .... we may substitute a with $2A$, and we have that $2b^2 = 4A^2$.

Dividing both sides with 2 (9) .... $b^2 = 2A^2$, and using similar arguments as above, we (10) .... that $2 \mid b$. (11) .... , $\sqrt{2} = \dfrac{a}{b}$ we assumed that such that a and b were coprime, and have now found that $2 \mid a$ and $2 \mid b$; a contradiction.

(12) .... , the assumption was false, and $\sqrt{2}$ cannot be written as a rational number. (13) .... , it is irrational.[84]

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[84] The text is borrowed and modified from http://en.wikibooks.org/wiki/Famous_Theorems_of_Mathematics/%E2%88%9A2_is_irrational as of 23d December 2013.

Differentiated Activity

Task 18. Tiered Task

You are going to watch a video which explains the proof of a logarithm theorem. You have 10 minutes to do and check the tasks after watching it. To watch the video, use the following link:
http://www.youtube.com/watch?v=vi7tnxKU4SI

Part 1. Fill in the missing words.

Let's say that log to the base a of M times N (1) …….. the log to the base a of M plus log to the base a of N.

(2) .... differently, the logarithm of the product of two (3) ……….. is equal to the sum of the logarithms of the numbers.

To (4) ……….. this, let's say that log to the base a of M is x, and log to the base a of N is y.

Then, by (5) ………….., if the log to the base a of M is x, then a to the (6) ……….. of x is M. Writing it as an exponential, a to the power of y is N.

Then, let's multiply these two (7) ………. . So, we get a to the power of x times a to the power of y is M (8) ……….. N.

And multiplying the (9) …………. a to the power of x times a to the power of y is a to the power of x plus y equals M times N.

Now, we have an exponential, (10) ……….. can be written as a (11) ………… . So, log to the base a of M times N equals x plus y. And once we have this (12) ………… we put x and y back into it, (13) ………… x is log to the base a of M, and y is log to the base a of N.

(14) ………… , log to the base a of M times N is log to the base a of M plus log to the base a of N, and we have (15) ………. the theorem.

Part 2. As you listen to the record, try to write down step-by-step equations which prove the theorem. Be ready to read them.

Part 3. Write down all the necessary information and repeat the proof of the theorem, using the words that stipulate the logical order of the proof.

Task 19. Tiered Task

When writing a proof of the theorem, it is very important to ensure that every sentence and word is written correctly.[85] Read the following theorems and their proofs and complete at least one part of the task. You have 10 minutes for this task.

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[85] The text is borrowed and modified from http://en.wikipedia.org/wiki/Mathematical_proof as of 6th January 2014.

Part 1. Read the following proof of the theorem. Choose one of the words in bold.

Theorem: If an integer is (exactly) divisible by 6, it must be even.

Proof:

Assume / Propose that n= 6d.

Since /Therefore, n= 2(3d).

So, **if / unless** we let r= 3d, we see **that / which** n= 2r **to** / **for** some integer r, **so/which** means **that/what** n is even.

Part 2. For gaps 1-10 choose the correct word (a-d).

Theorem: The sum of two even integers is always even.

Proof:

(1) .... two even integers *x* and *y*.

(2) .... they are even, they (3) .... be written (4) .... *x = 2a* and *y = 2b*, respectively, (5) .... integers *a* and *b*.

(6) .... the sum *x + y = 2a + 2b = 2(a+b)*.

(7) .... *x + y* has 2 as a factor and, by (8) ...., is even.

(9) .... the sum of (10) .... two even integers is even.

1	a. think	b. consider	c. suppose	d. let
2	a. because	b. why	c. since	d. hence
3	a. can	b. must	c. want	d. ought to
4	a. like	b. what	c. that	d. as
5	a. to	b. as	c. until	d. for
6	a. then	b. after	c. because	d. for
7	a. because	b. let	c. therefore	d. suppose
8	a. example	b. definition	c. chance	d. order
9	a. let	b. since	c. hence	d. because
10	a. no	b. any	c. every	d. very

Part 3. Find and correct the mistakes in every line of the proof.

Theorem: $\sqrt{2}$ *is an irrational number.*

Proof:

1 2 3 4 5 6 7 8 9 10	Supposing that $\sqrt{2}$ were a rational number, so by definition $\sqrt{2} = \dfrac{a}{b}$ where a and b are non-zero integers with no common factor. This, $b\sqrt{2} = a$. Squaring both sides yield $2b^2 = a^2$. Since 2 divides the left hand side, 2 must also divide the right hand side (as they are equal and both integers). If a^2 is even, which implies that a must also be even. So we must write $a = 2c$, where c is also an integer. Substitution into an original equation yields $2b^2 = (2c)^2 = 4c^2$. Dividing every sides by 2 yields $b^2 = 2c^2$. But then, by the same argument as before, 2 divides b^2, so b must be even. However, unless a and b are both even, they share a factor, namely 2. This contradicting our assumption, so we are force to conclude that $\sqrt{2}$ is an irrational number.

Task 20. Pair Work

Try to solve famous Sam Loyd's puzzle known as Covent Garden problem. Write down your solution to the puzzle using linking words. Peer check your answers after doing so. You have time until the ends of the class.

Covent Garden Problem

Mrs. Smith and Mrs. Jones had equal number of apples but Mrs. Jones had larger fruits and was selling hers at the rate of two for a penny, while Mrs. Smith sold three of hers for a penny.

Mrs. Smith was for some reason called away and asked Mrs. Jones to dispose of her stock. Upon accepting the responsibility of disposing her friend's stock, Mrs. Jones mixed them together and sold them of at the rate of five apples for two pence.

When Mrs. Smith returned the next day the apples had all been disposed of, but when they came to divide the proceeds they found that they were just seven pence short, and it is this shortage in the apple or financial market which has disturbed the mathematical equilibrium for such a long period.

Supposing that they divided the money equally, each taking one-half, the problem is to tell just how much money Mrs. Jones lost by the unfortunate partnership?[86]

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[86] The text is borrowed and modified from http://en.wikipedia.org/wiki/Mathematical_proof as of 7th January 2014.

Optional Activity

Task 21. Facilitated Task

Look at the table depicting the steps of solving *5 x - 6 = 3 x – 8* equation. Match linking words with the equations and steps description to make a proper solving.

Firstly,	1.	$x = -1$	a.	Add 6 to both sides of the equation
Next,	2.	$2x - 6 = -8$	b.	Subtract 3x from both sides of the equation
Finally,	3.	$2x = -2$	c.	Divide both sides by 2

Task 22. Try to solve famous Sam Loyd's puzzle. Write down your solution to the puzzle using linking words and words of logical sequence.

Guess the Boy's Age

It appears that an ingenious or eccentric teacher being desirous of bringing together a number of older pupils into a class he was forming, offered to give a prize each day to the side of boys or girls whose combined ages would prove to be the greatest.

Well, on the first day there was only one boy and one girl in attendance, and, as the boy's age was just twice that of the girl's, the first day's prize went to the boy.

The next day the girl brought her sister to school, and it was found that their combined ages were just twice that of the boy, so the two girls divided the prize.

When school opened the next day, however, the boy had recruited one of his brothers, and it was found that the combined ages of the two boys were exactly twice as much as the ages of the two girls, so the boys carried off the honors of that day and divided the prizes between them.

The battle waxed warm and on the fourth day the two girls appeared accompanied by their elder sister; so it was then the combined ages of the three girls against the two boys, and the girls won off course, once more bringing their ages up to just twice that of the boys'. The struggle went on until the class was filled up, but as our problem does not need to go further than this point, to tell the age of that first boy, provided that the last young lady joined the class on her twenty-first birthday. Now, guess the first boy's age.[87]

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[87] The text is borrowed and modified from http://www.mathsisfun.com/puzzles/guess-the-boy-s-age-solution.html as 8th January 2014.

Unit 10. Discrete Mathematics

Lesson 19

Whole-Class Activity

Task 1. Pre-Assessment

You are going to read questions about Discrete Mathematics. Use your background knowledge to answer them. You may turn to Activity Pack if you need any scaffolds. You have 5 minutes to complete this task.

RATIONAL CONCERN

1. What topics of Discrete Math do you believe to be most useful?
2. What do you think is the hardest topic of Discrete Math?
3. How can knowledge of Discrete Math be applied in everyday life?

Practical Concern

1. What practical application does Discrete Math have?
2. What tasks does Discrete Math solve?
3. What spheres of activity need Discrete Math most?

Analytical Concern

1. What is Discrete Mathematics?
2. What is the difference between Discrete Math and Algebra?
3. How can Discrete Mathematics help in business?

Creative Concern

1. What is the most interesting topic of Discrete Math?
2. What associations do you have with Discrete Mathematics?
3. How can Discrete Mathematics help to create art objects?

Task 2. Reading

Now, read the text about Discrete Mathematics and answer the quiz questions. You have 20 minutes for this activity.

Discrete Mathematics

Discrete mathematics is the study of mathematical structures that are fundamentally discrete rather than continuous. In contrast to real numbers that have the property of varying "smoothly", the objects studied in discrete mathematics – such as integers, graphs, and statements in logic – do not vary smoothly in this way, but have distinct, separated values. Discrete mathematics therefore excludes topics in "continuous mathematics" such as calculus and analysis. Discrete objects can often be enumerated by integers. More formally,

discrete mathematics has been characterized as the branch of mathematics dealing with countable sets (sets that have the same cardinality as subsets of the natural numbers, including rational numbers but not real numbers). However, there is no exact, universally agreed, definition of the term "discrete mathematics." Indeed, discrete mathematics is described less by what is included than by what is excluded: continuously varying quantities and related notions.
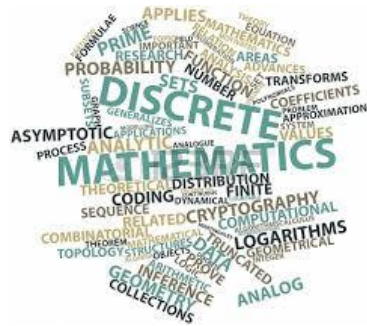
The set of objects studied in discrete mathematics can be finite or infinite. The term finite mathematics is sometimes applied to parts of the field of discrete mathematics that deals with finite sets, particularly those areas relevant to business.

The study of how discrete objects combine with one another and the probabilities of various outcomes is known as combinatorics. Other fields of mathematics that are considered to be part of discrete mathematics include graph theory and the theory of computation. Topics in number theory such as congruencies and recurrence relations are also considered part of discrete mathematics.
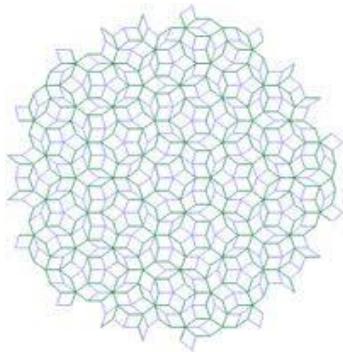
The study of topics in discrete mathematics usually includes the study of algorithms, their implementations, and efficiencies. Discrete mathematics is the mathematical language of computer science, and as such, its importance has increased dramatically in recent decades.

Research in discrete mathematics increased in the latter half of the twentieth century partly due to the development of digital computers which operate in discrete steps and store data in discrete bits. Concepts and notations from discrete mathematics are useful in studying and describing objects and problems in branches of computer science, such as computer algorithms, programming languages, cryptography, automated theorem proving, and software development. Conversely, computer implementations are significant in applying ideas from discrete mathematics to real-world problems, such as in operations research.

Although the main objects of study in discrete mathematics are discrete objects, analytic methods from continuous mathematics are often employed as well.[88]

1. What does Discrete Mathematics study?

   A. Any mathematical structures.   C. Integers, graphs etc.
   B. Continuous structures.   D. Astrological predictions.

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[88] The text is borrowed and modified from http://mathworld.wolfram.com/DiscreteMathematics.html and http://en.wikipedia.org/wiki/Discrete_mathematics as of 9th January, 2014.

2. What topics are excluded from Discrete Mathematics` study?

    A. Calculus and analysis.   C. Combinatorics.
    B. Logic.   D. Probability.

3. Combinatorics studies…

    A. words and sentences.   C. any numbers.
    B. computations.   D. how discrete objects combine.

4. What was the reason of discrete mathematics research increase?

    A. Economical value.   C. Social changes.
    B. Development of digital   D. Development of space
       computers.   exploration.

5. Where can concepts of discrete mathematics be useful?

    A. Geography.   C. Computer Science.
    B. Linguistics.   D. Physical Education.

Task 3. Vocabulary Practice Task 3.

Match the spheres of Discrete Mathematics` (1-8) study with their descriptions (a-h). You have 5 minutes for this task.

1. Coding theory	a) is concerned with identifying the values, uncertainties and other issues relevant in a given decision, its rationality, and the resulting optimal decision
2. Logic	b) deals with situations where success depends on the choices of others, which makes choosing the best course of action more complex
3. Decision theory	c) is the branch of mathematical logic that studies sets, which are collections of objects
4. Combinatorics	d) the study of the properties of codes and their fitness for a specific application
5. Game theory	e) is concerned with the properties of numbers in general, particularly integers
6. Probability theory	f) the study of the principles of valid reasoning and inference
7. Number theory	g) studies the way in which discrete structures can be combined or arranged
8. Set theory	h) deals with events that occur in countable sample spaces

Task 4. Vocabulary Practice

Read the following extract about social choice theory, which lies in the scope of study of Discrete Mathematics. Suggest your antonyms to the adjectives in bold. Underline suffixes and prefixes which are used in adjectives. You have 3 minutes for this task.

Social choice theory or social choice is a (1) **practical** framework for analysis of combining individual opinions to reach a (2) **individual** decision or social welfare. Individual preferences are collected to produce a social welfare function – essentially a preference ranking of the scenarios that are (3) **impossible** to society. Social choice theory is the philosophical and mathematical study of the type of conclusions that can be determined through (4) **same** aggregation methods.

Using (5) **similar** factors such as interests, values and welfare, social choice theory aims to determine the (6) **worst** rules of structuring a (7) **unfair** voting framework. Social choice theory is a (8) **failing** discipline started by Kenth Arrow who originated the study following his introduction of the impossibility theorem in 1951. This theory is (9) **inapplicable** to group decision making, negotiations and (10) **same** economic processes.[89]

Task 5. Language in Use

Conditionals are often used in mathematical discourse with the aim of explaining hypothesis-conclusion relations. They are often used in proofs, equations solving, explanations etc. Study the table in which the use and functions of conditionals are explained. After doing so, match the parts of the table to create conditionals. You have 10 minutes for this task.

Conditionals
Conditionals consist of two parts: if-clause (hypothesis) and main clause (result). There are four main types of conditional sentences:
Type 0 – expresses something which is always true. If + present simple, main clause – present simple *e.g. If we add two positive numbers, it makes positive number.*
Type 1 – expresses real or very probable actions in the present/future. If+present simple, main clause – future/imperative/modal verb

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[89] The text is borrowed and modified from http://en.wikipedia.org/wiki/Social_choice_theory as of 9th January, 2014.

e.g. If you solve this equation, the next one will be easy to understand.

Type 2 – expresses imaginary situations which are unlikely to happen in the present of future.

If+ past simple/past continuous, main clause- would/could +pres. Infinitive

e.g. If I were you, I would use another method.

If the numbers were even, it would be easier to solve equation.

Type 3 – expresses imaginary situations that are contrary to facts in the past.

If+past perf./past perf. continuous, main clause - would/could+perf.infinitive

e.g. If we had used another method, the proof would have been shorter.

If the population of men is 45 %,	we could solve the equation.
If x = 2,	we receive even number.
If you score 95 % at the lesson,	the conclusion would be true.
If the total number was given,	the population of women is 55 %.
If he had known all the variants,	you will find y and z.
If you find x,	then 3 – x = 1.
If we add two odd numbers,	he would have chosen the other one.
If the hypothesis was true,	you will receive A.

Differentiated Activity

Task 6. Group activity

Work out the topical content of the extracts and report your findings to the class. You have 10 minutes for this task.

Group 1. Read the following extract and get ready to explain the algorithm by drawing an example.

The nearest neighbour algorithm was one of the first algorithms used to determine a solution to the travelling salesman problem. In it, the salesman starts at a random city and repeatedly visits the nearest city until all have been visited. It quickly yields a short tour, but usually not the optimal one.
These are the steps of the algorithm:
1. Stand on an arbitrary vertex as current vertex.
2. Find out the shortest edge connecting current vertex and an unvisited vertex V.
3. Set current vertex to V.
4. Mark V as visited.
5. If all the vertices in domain are visited, then terminate.
6. Go to step 2.

Group 2. Read the following extract and get ready to explain the strengths and drawbacks of the algorithm.

The nearest neighbour algorithm is easy to implement and executes quickly, but it can sometimes miss shorter routes which are easily noticed with human insight, due to its "greedy" nature. As a general guide, if the last few stages of the tour are comparable in length to the first stages, then the tour is reasonable; if they are much greater, then it is likely that there are much better tours. Another check is to use an algorithm such as the lower bound algorithm to estimate if this tour is good enough.

In the worst case, the algorithm results in a tour that is much longer than the optimal tour. To be precise, for every constant r there is an instance of the travelling salesman problem such that the length of the tour computed by the nearest neighbour algorithm is greater than r times the length of the optimal tour. Moreover, for each number of cities there is an assignment of distances between the cities for which the nearest neighbour heuristic produces the unique worst possible tour. The nearest neighbour algorithm may not find a feasible tour at all, even when one exists.[90]

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[90] The text is borrowed and modified from http://en.wikipedia.org/wiki/Nearest_neighbour_algorithm as of 10th January, 2014.

Group 3. Read the extracts from the tasks of Group 1 and 2. Inside your group, discuss what practical applications the algorithm may have and where the "travelling salesman problem" may appear.

Task 7. Tiered Task

You are going to watch a video with Robert Sedgewik talking about the course in Analytic Combinatorics. Choose whatever part of the task you feel confident to complete or do them all. You have 10 minutes for the task. Use the following link to watch the video: http://www.youtube.com/watch?v=Zrq-8qZks3U

Part 1. Decide whether the following statements are true (T) or false (F). Justify your answer.

1. According to D. Knuth, people who analyse algorithms can appreciate either elegant mathematical patterns or elegant computational procedures. □
2. The theoretical payoff of algorithm study is getting the job done more quickly and more economically. □
3. The study of algorithms on a scientific basis started over 50 years ago. □
4. Donald Knuth put the study of algorithms on a scientific basis. □
5. The course begins with the introduction to the Symbolic Method. □
6. The Symbolic Method for defining Generating Functions is described in the context of applications and the analysis of algorithms. □
7. Permutations, Trees, Streams, Words and Mappings belong to Basic Structures. □

Part 2. Fill in the gaps:

"People who analyse (1) …………. have double happiness. First of all, they (2) …………. the sheer beauty of elegant mathematical (3) …………. that surround elegant (4) …………… procedures. Then they receive a practical (5) ………… when their theories make it (6) …………. to get other jobs done more quickly and more (7) …………. ." – that`s how Donald Knuth, who put the study of algorithms on a scientific (8) ………… over 50 years ago, described the (9) …………. behind the analysis of algorithms. This course begins with the introduction to (10) ………… Functions and Real Asymptotics and then introduces the (11) ………….. Method for defining Generating Functions in the context of applications and the (12) ………. of algorithms, as well as basic structures, such as (13) …………, Trees, Streams, Words and (14) …………. .As such, it is an introduction to Analytic (15) …………. in a context of the analysis of algorithms.

Part 3. Answer the following questions:

1. What does D. Knuth mean by saying that "People who analyse algorithms have double happiness"?
2. What practical effect may be achieved through the study of algorithms?
3. What topics are included in the Basic Structures?
4. What other topics are introduced in the course of Analytic Combinatorics?

Task 8. Pair work

Work in pairs. Using the help box from Task 5, ask each other questions about what would happen:

…if you were given the Nobel Prize?
…if there were no calculating machines?
…if you had to choose only one science to study?
…if every person was a mathematical prodigy?
…if you could analyse all the probabilities of any event?

You have 5 minutes to complete this task.

Task 9. Team Work: Brain Ring: Revanche

You are going to be divided into three teams. Choose your team name and the captain. The Brain Ring competition consists of two parts:
1. You have to solve and explain the solution of one of the suggested puzzles.
2. You have to prepare the puzzle to the rival team and solve theirs.
The team which does both parts of the Brain Ring correctly, wins.

Puzzle 1.
How many words of length 8 can you form, where the first letter is the same as the last letter (there are 26 letters in English alphabet)?

Puzzle 2.
How many ways can 5 people sit in a row if 2 of them insist on not sitting together?

Puzzle 3.
The code to open a combination lock is an ordered sequence of four digits chosen from the set {1, 2, 3, 4, 5, 6}. How many codes are possible if repetition
(1) is allowed
(2) is not allowed?

Optional Activity

Task 10. Facilitated Task

Read the extract from the text about Discrete Mathematics. Put the words in brackets into the correct form.

Discrete mathematics **(be)** the study of mathematical structures that **(be)** discrete rather than continuous. In contrast to real numbers, discrete mathematics **(study)** objects such as integers, graphs, and statements in logic. These objects do not vary smoothly, but have distinct, separated values. Discrete mathematics therefore **(exclude)** topics such as calculus and analysis. Discrete objects can often **(count)** using integers.

Mathematicians say that this is the branch of mathematics **(deal)** with countable sets (sets that have the same cardinality as subsets of the natural numbers, including rational numbers but not real numbers). The set of objects **(study)** in discrete mathematics can be finite or infinite. The term finite mathematics is sometimes **(apply)** to parts of the field of discrete mathematics that deals with finite sets, particularly those areas relevant to business.

Research in discrete mathematics **(increase)** in the latter half of the twentieth century partly due to the development of digital computers which **(operate)** in discrete steps and store data in discrete bits. Concepts discrete mathematics **(be)** useful in studying and describing objects and problems in branches of computer science, such as computer algorithms, programming languages, cryptography and software development. In turn, computer implementations **(be)** significant in applying ideas from discrete mathematics to real-world problems, such as in operations research.[91]

Task 11. Complex Task

Read the article about one of the trends of future programming. Answer the following questions:
1. What does the "Platonish position on Math" mean?
2. What are the earliest known Mathematics applications?
3. What definition of Math does the author give?
4. What do the words "construct useful fictions" mean in the context of the text?
5. What may happen if we encounter other systems of intelligence, according to the author?

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[91] The text is borrowed and modified from http://simple.wikipedia.org/wiki/Discrete_mathematics as of 10th January, 2014.

Does Math Really Exist?

By Alex Knapp

In the midst of a rather interesting discussion of the notion of Aristotle's Unmoved Mover, Leah Libresco went on a mild digression about the philosophy of mathematics that I couldn't let go of, and feel compelled to respond to. She says:

"I take what is apparently a very Platonist position on math. I don't treat it as the relationships that humans make between concepts we abstract from day to day life. I don't think I get the concept of 'two-ness' from seeing two apples, and then two people, and then two houses and abstracting away from the objects to see what they have in common.

I think of mathematical truths existing prior to human cognition and abstraction. The relationship goes the other way. The apples and the people and the houses are all similar insofar as they share in the form of two-ness, which exists independently of material things to exist in pairs or human minds to think about them."

The notion that there's something special about math – that it has some sort of metaphysical significance – only makes sense if you ignore the history of how we uncovered math to begin with. It was, despite Leah's protestations, *exactly* just the abstraction of pairs and triplets and quartets, etc. The earliest known mathematics appear to be attempts to quantify time and make calendars, with other early efforts directed towards accounting, astronomy, and engineering.

Mathematics is nothing more and nothing less a tool that's useful for humans in solving particular problems. Math can be used to describe reality or **construct useful fictions**. For example, we know now that the space time we live in is non-Euclidian. But that doesn't make Euclidian geometry useless for everyday life. Quite the contrary – it's used every day. You can use mathematics to build models of reality that may not actually have any bearing on what's real. For example, the complicated math used to describe how the planets moved in the Ptolemaic model of the solar system – where everything orbited in circles around the Earth – actually produced very accurate predictions. But it was also wrong. There aren't actually trillions of physical dollars circulating in the economy – there are just symbols for them floating around.

The bottom line is that human beings have brains capable of counting to high numbers and manipulating them, so we use mathematics as a useful tool to describe the world around us. But numbers and math themselves are no more real

than the colour blue – 'blue' is just what we tag a certain wavelength of light because of the way we perceive that wavelength. An alien intelligence that is blind has no use for the colour blue. It might learn about light and the wavelengths of light and translate those concepts completely differently than we do.

In the same way, since the only truly good mathematicians among the animals are ourselves, we assume that if we encounter other systems of intelligence that they'll have the same concepts of math that we do. But there's no evidence to base that assumption on. For all we know, there are much *easier* ways to describe physics than through complicated systems of equations, but our minds may not be capable of symbolically interpreting the world in a way that allows us to use those tools, any more than we're capable of a tool that requires the use of a prehensile tail.

Math is a useful descriptor of both real and fictional concepts. It's very fun to play around with and its essential for understanding a lot of subjects. But it's just a tool. Not a set of mystical entities.[92]

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[92] The text is borrowed and modified from http://www.forbes.com/sites/alexknapp/2012/01/21/does-math-really-exist/ as of 10th January, 2014.

Lesson 20

Whole-Class Activity

Task 12. Do or check Tasks 1-2 in your Workbook (10 minutes).

Task 13. Be ready to report the results of your Internet search (Task 3). Ask each other questions about Discrete Mathematics topics (10 minutes).

Task 14. In groups, discuss the following questions. Consult the information box if necessary (5 minutes):

1. What is an abstract?
2. What is the aim of an abstract?
3. In what spheres can abstracts be used?
4. In what part of a manuscript can an abstract appear?
5. What elements does an abstract consist of?
6. What elements of a an abstract are the most important?
7. What is the required length of an abstract?

An abstract is a brief summary of a research article, thesis, review, conference proceeding or any in-depth analysis of a particular subject or discipline, and is often used to help the reader quickly ascertain the paper's purpose. When used, an abstract always appears at the beginning of a manuscript or typescript, acting as the point-of-entry for any given academic paper or patent application.

An academic abstract typically outlines four elements relevant to the completed work:

The research focus (i.e. statement of the problem(s)/research issue(s) addressed);

The research methods used (experimental research, case studies, questionnaires, etc.);

The results/findings of the research; and

The main conclusions and recommendations.

Task 15. Read the following style guide on writing an abstract. Match the paragraphs with the headings (15 minutes).

A. Explain your methods.
B. Identify your purpose.
C. Write your paper first.
D. Describe your results.

E. Explain the problem at hand.
F. Give your conclusion.
G. Determine the type of abstract you must write.

Writing an Abstract[93]

If you need to write an abstract for an academic or scientific paper, don't panic; your abstract is simply a summary of the work or paper that others can use as an overview. It helps your reader to understand the paper and helps people search for a particular work to find and decide whether it suits their purposes. An abstract is only a summary of the work you've already done, it's easy to accomplish!

1._____ Even though an abstract goes at the beginning of the work, it acts as a summary of your entire paper. Rather than introducing your topic, it will be an overview of everything you write about in your paper.

2._____There are two primary styles of abstract: descriptive and informative. Typically, informative abstracts are used for much longer and technical research while descriptive abstracts are best for shorter papers.

3._____The reader wants to know why your research is important, and what the purpose of it is. Start your abstract by answering one or all of the following:

- Why did you decide to do this study?
- Why is this research important?
- Why should someone read your entire essay?

4._____Readers need to know about the primary issue your paper deals with. You can sometimes combine the problem with your motivation, but it is best to be clear and separate the two.

- What problem is your research trying to better understand or solve?
- What is the scope of your study – a general problem or something specific?
- What is your main claim or argument?

5._____ Give an overview of how you accomplished your study. If you did your own work, include a description of it here. If you reviewed the work of others, it can be briefly explained.

- Discuss your own research including the variables and your approach.
- Describe the evidence you have to support your claim
- Give an overview of your most important sources.

6._____ In an informative abstract, you will be asked to provide the results of your study.

- What is it that you found?

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[93] The text is borrowed and modified from http://www.wikihow.com/Write-an-Abstract as of 13th January 2014.

- What answer did you reach from your research or study?
- What are the general findings?

7._____ This should finish up your summary and give closure to your abstract. In it, address the meaning of your findings as well as the importance of your overall paper. You may address the following questions in an informative abstract:

- What are the implications of your work?
- Are your results general or very specific?

Task 16. Analyse the following abstract and answer the questions:

➢ What is the topic of the abstract?
➢ Why is the research important?
➢ What is the main claim of the article?
➢ What methods are used in the research?
➢ What are the results of the research?
➢ What are the implications of the research?

Binary cyclic codes from explicit polynomials over $GF(2^m)$

By Cunsheng Ding, Zhengchun Zhou

Abstract

Cyclic codes are a subclass of linear codes and have applications in consumer electronics, data storage systems, and communication systems as they have very efficient encoding and decoding algorithms. In this paper, monomials and trinomials over finite fields with even characteristic are employed to construct a number of families of binary cyclic codes. Lower bounds on the minimum weight of some families of the cyclic codes are developed. The minimum weights of other families of the codes constructed in this paper are determined. The dimensions of the codes are flexible. Some of the codes presented in this paper are optimal or almost optimal in the sense that they meet some bounds on linear codes. Open problems regarding binary cyclic codes from monomials and trinomials are also presented.[94]

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[94] The text is borrowed and modified from http://www.sciencedirect.com/science/article/pii/S0012365X13005311 as of 13th January 2014.

Task 17. Restore the original form of the following abstract and put its parts into a logical order.[95]

a.	At each time step the second player guesses a vertex, winning if it is the current location of the first player; if not the first player must move along an edge.

b.	It is shown that the graphs on which the second player can guarantee to win are precisely the trees that do not contain a particular forbidden subgraph, and best possible capture times on such graphs are obtained.

c.	One player moves invisibly around the graph, and the other player must guess his position.

d.	This paper introduces a pursuit and evasion game to be played on a connected graph.

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[95] The text is borrowed and modified from http://ac.els-cdn.com/S0012365X13003920/1-s2.0-S0012365X13003920-main.pdf?_tid=5ed52558-7c97-11e3-8956-00000aab0f01&acdnat=1389647712_444fda17c0265edd5bf036f9fac43d3d as of 13th January 2014.

Differentiated Activity

Task 18. Tiered Task

Part 1. Analyse the following abstracts A and B. Answer the questions:

- What style is used in these abstracts?
- How do they differ?
- What do they have in common?

A.

Abstract. In 1959, Klee proved that a convex body K is a polyhedron if and only if all of its projections are polygons. In this paper, a new proof of this theorem is given for convex bodies in R3.[96]

B.

Abstract. This is a brief survey on Euclidean embeddings of finite metric spaces, focusing on the power transform metric with many examples. Some old results are presented in slightly improved forms, and the last section contains a few new results. Proofs are given if they are elementary and not too long. Several problems and conjectures are also given.[97]

Part 2. Compare abstracts C and D and answer the following questions:

- What do they have in common and what is different?
- What grammatical constructions are often used in abstracts? Give examples.
- What personal pronoun is used to define the author in the abstracts? Why?

C.

Abstract. Boolean expressions of Boolean algebras are logically equivalent to conditional logic expressions; we define and give theorems about equivalences of general conditional expressions; moreover, conditional expressions are properly contained in *n*-valued Post algebras. Theorems are given regarding equivalences of conditional logic in Post logic.[98]

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[96] The text is borrowed from http://www.sciencedirect.com/science/article/pii/S0012365X13004056 as of 15th January 2014.

[97] The text is borrowed from http://www.sciencedirect.com/science/article/pii/S0012365X13003841 as of 15th January 2014.

[98] The text is borrowed from http://www.sciencedirect.com/science/article/pii/0012365X74901253 as of 15th January 2014.

D.

Abstract. An easy implementable polynomial algorithm to test for isomorphism of graphs embedded in arbitrary compact surfaces (maps) is given. The maps are defined algebraically by Tutte's axtom system. We produce a canonical codification of them as a sequence of $4e$ integers ($2e$ if the map is orientable) where e is the number of edges. To test for isomorphism between two maps we just have to compare their codes. Some applications relying on the implementation are given.[99]

Part 3. Compare abstracts E and F and answer the following questions:

- What do these abstracts have in common and what is different?
- What structure elements do they have?
- Which abstract has more explicit structure? What expressions are used to introduce the structure elements?

E.

Abstract. Let $S = x_1, x_2, \ldots x_n$ be a sequence of n distinct elements from a linearly ordered set. We consider the problem of determining the length of the longest increasing subsequences of S. An algorithm which performs this task is described and is shown to perform $n \log n - n \log \log n + O(n)$ comparisons in its worst case. This worst case behavior is shown to be best possible.[100]

F.

Abstract. The paper deals with tournaments (i.e., with trichotomic relations) and their homomorphisms. The study of tournaments by means of their homomorphisms is natural as tournaments are algebras of a special kind. We prove (1) theorems which relate combinatorial and algebraic notions (e.g., the score of a tournament and the monoid of its endomorphisms); (2) theorems concerned with strictly algebraic aspects of tournaments (e.g., characterizing the lattice of congruences of a tournament). Our main result is that the group of automorphisms and the lattice of congruences of a tournament are in general independent. In the last part of the paper we give some examples and applications to other fields.[101]

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[99] The text is borrowed from http://www.sciencedirect.com/science/article/pii/0012365X80902320 as of 15th January 2014.

[100] The text is borrowed from http://www.sciencedirect.com/science/article/pii/0012365X7590103X as of 15th January 2014.

[101] The text is borrowed from http://www.sciencedirect.com/science/article/pii/0012365X75901041 as of 15th January 2014.

Task 19. Look at the following list of qualities of an abstract.[102] Decide which of them belong to good and bad qualities. In pairs, justify your opinion and propose other characteristics of a good abstract (5 minutes).

1. Uses one or more well-developed paragraphs, which are unified, coherent, concise, and able to stand alone;
2. Uses slang, common words and expressions;
3. Uses graphics, charts, pictures;
4. Uses an introduction-body-conclusion structure in which the parts of the report are discussed in order: purpose, findings, conclusions, recommendations;
5. Uses five or more paragraphs with plenty of information about the research;
6. Follows strictly the chronology of the report/paper/article;
7. Provides logical connections between material included;
8. Does not use introductory and linking words;
9. Adds no new information but simply summarizes the report;
10. Contains a lot of information about the research with detailed descriptions and explanations;
11. Uses terminology, which is understood only by specialists in the sphere;
12. Provides new information, which was not mentioned in the report/paper/article;
13. Is intelligible to a wide audience;
14. Uses first person pronouns and expresses the author's opinion on the problem.

Task 20. Pair work

Choose any task from the following:

Part 1. Prepare an abstract of the text from Task 6 (Unit 8) about the nearest neighbour algorithm.

Part 2. Prepare an abstract of the text from Task 2 (Unit 8) about Discrete Mathematics.

Part 3. Prepare an abstract of the article from Task 11(Unit 7) entitled "Math Myopia".

Ensure that your abstract contains the following parts:

➢ *Statement of the problem*
➢ *Findings / results*
➢ *Conclusions*

You have 20 minutes to perform and check the task.

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[102] The text is borrowed and modified from https://owl.english.purdue.edu/owl/resource/656/1/ as of 17th January, 2014.

Optional Activity

Task 21. Facilitated Task

Look at the following abstract.[103] Some parts have been taken out of it. Insert linking words and expressions A-F into the gaps 1-6 to make a proper abstract.

Abstract (1) **………………** a new method to solve functional equations of multivariate generating functions, (2) …………. $F(r, s) = e(r, s) + x f(r, s) F(1,1) + x g(r, s) F(q\ r, 1) + x h(r, s) F(q\ r, q\ s)$, giving a formula for $F(r, s)$ (3) ……………… a sum over finite sequences. (4) …………………. to show how one would calculate the coefficients of the generating function for parallelogram polyominoes, (5) …………. impractical using other methods. (6) …………….. this method to answer a question from fully commutative affine permutations.	A. *We use this method* B. *such as* C. *which is* D. *in terms o f* E. *This paper presents* F. *We also apply*

Task 22. Complex Task

Analyse the following abstract and fill the information into the table:

Problem	
Aim	
Methodology	
Results	

Three types of randomness are integral to the strength of public-key cryptography. With the techniques of Allender et al., we present an analysis of how the ability to quickly distinguish Kolmogorov randomness allows for a probabilistic attack on two of the conjectured hard problems underlying public-key cryptography: the discrete logarithm and factoring. Specifically, Kolmogorov random strings are pertinent to inverting one-way functions and distinguishing pseudorandomness from true uniform randomness. This method provides a lens that more sharply categorizes the hardness of the discrete logarithm and factoring in the hierarchy of well-known complexity classes. Using this approach, we establish relationships between provably secure public-key cryptography, Kolmogorov complexity, and the essential cryptographic primitives.[104]

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[103] The text is borrowed and modified from http://www.sciencedirect.com/science/article/pii/S0012365X13004901 as of 17th January, 2014.

[104] The text is borrowed and modified from
http://uss.tufts.edu/arc/HOW%20TO%20WRITE%20AN%20ABSTRACT%20for%20Tufts%20Symp.pdf as of 17th January, 2014.

MODULE 4 TEST. MATHEMATICAL SYSTEMS

1. The basic arithmetic operations are addition, ……….. , multiplication and division.

a) Subtraction   b) percentages   c) exponentiation   d) square roots

2. A branch of pure mathematics devoted primarily to the study of the integers.

a) Number Theory   b) Mathematics   c) Integrals Theory   d) Logarithmic

3. The .... of operations is a rule used to clarify which procedures should be performed first.

a) Change   b) procedure   c) precedence   d) way

4. What is Arithmetic NOT used for?

a) day-to-day counting   b) advanced science   c) fiction   d) business calculations

5. The "Queen of Mathematics" is ….

a) Number Theory   b) Algebra   c) Chemistry   d) Geometry

6. Splitting into equal parts or groups is called ………

a) addition   b) division   c) multiplication   d) logarithm

7. A number which produces a specified quantity when multiplied by itself is ………

a) exponentiation   b) multiplication   c) subtraction   d) square root

8. A mathematical operation that represents the operation of removing objects from a collection is ……….

a) multiplication   b) square root   c) exponentiation   d) subtraction

9. A mathematical operation that represents the total amount of objects together in a collection is ……….

a) subtraction   b) multiplication   c) addition   d) exponentiation

10. An operation that, for positive integers, consists of adding a number (the multiplicand) to itself a certain number of times is ……….

a) addition   b) square root   c) exponentiation   d) multiplication

11. A quantity representing the power to which a fixed number (the base) must be raised to produce a given number …………..

a) multiplication   b) logarithm   c) subtraction   d) square root

12. The operation of raising one quantity to the power of another ……….

a) exponentiation   b) logarithm   c) square root   d) addition

13. Since the introduction of modern algebraic notation, ... has taken precedence over addition.

a) multiplication   b) subtraction   c) operation   d) equality

14. It deals with events that occur in countable sample spaces.

a) number theory   b) game theory   c) probability theory   d) logic

15. The study of the principles of valid reasoning and inference.

a) probability theory   b) logic   c) game theory   d) number theory

16. The study of the properties of codes and their fitness for a specific application.

a) logic   b) game theory   c) probability theory   d) coding theory

17. It deals with situations where success depends on the choices of others, which makes choosing the best course of action more complex.

a) decision theory   b) probability theory   c) number theory   d) game theory

18. It is concerned with identifying the values, uncertainties and other issues relevant in a given decision, its rationality, and the resulting optimal decision.

a) decision theory   b) game theory   c) probability theory   d) logic

19. The branch of mathematical logic that studies sets, which are collections of objects.

a) set theory   b) game theory   c) probability theory   d) decision theory

20. It is concerned with the properties of numbers in general, particularly integers.

a) game theory   b) logic   c) set theory   d) number theory

21. It studies the way in which discrete structures can be combined or arranged.

a) game theory   b) combinatorics   c) logic   d) probability theory

22. What does Discrete Mathematics study?

| a) Astrological predictions | b) Integers, graphs etc | c) Continuous structures | d) Any mathematical structures |

23. What topics are excluded from Discrete Mathematics' study?

| a) Calculus and analysis | b) Logic | c) Combinatorics | d) Probability |

24. What was the reason of discrete mathematics research increase?

| a) Development of space exploration | b) Social changes | c) Development of digital computers | d) Economical value |

25. Where can concepts of discrete mathematics be useful?

| a) Geography | b) Linguistics | c) Computer Science | d) Physical Education |

FINAL TEST

Task 1. You are going to read an article about the use of computers in business. Read the text and decide whether the following sentences are true (T) or false (F).

1. Computers facilitate business operations in many areas.
2. Only personal computers are used in business.
3. Computerized phone systems can be used during off hours.
4. Marketing videos can be edited with the help of a third party only.
5. Computer accounting can be risky for human.
6. Accounting software allows businesses to have accurate and quick reports.
7. Encryption and replace keys endanger data storage.
8. Central storage allows multiple computers to access data.
9. Spreadsheet applications can manage either numeric or alphabetic data.
10. Online webinars can fit the busy schedules of businesses.

COMPUTERS IN BUSINESS

Almost every business uses computers to complete daily tasks. From making contact with clients to inputting data for reports, computers allow businesses a more efficient way to manage affairs when compared to traditional paper and folders. Businesses use a variety of different types of computers such as desktops, laptops, servers and tablets, depending on their needs. The basic reasons for the use of IT in business are as follows:

Communication

Communication is key when gaining and maintaining clients and other important contacts. Computers give businesses access to email, instant messaging and customer contact systems. Computerized phone systems allow for automated support during off hours and a virtual operator can quickly direct callers to the correct department for faster support.

Marketing

Computers allow businesses to create websites, stunning ads and complete marketing campaigns. Marketing videos can be edited and custom ads created in-house with the use of specialized software. Businesses can completely develop and manage websites with their own servers or connect remotely to a third-party business to upload their latest content such as articles, product images and blog posts.

Accounting

Accounting without computers presents a high risk for human error. Accounting software allows businesses to simply input their financial data and instantly see gains and losses. All necessary tax reports are available the moment the data is entered. Using computers for managing expenses and calculating profit is vital for ensuring financial data is as accurate as possible.

Storage

Instead of filing cabinets, businesses are able to store millions of files using computers and servers. Data can be stored centrally for easy access from multiple computers or stored locally for individual use. Computerized storage saves space and provides a far more efficient organization strategy. With encryption, passwords and replace keys, data remains secure.

Documents and Reports

Most businesses have some sort of productivity software which typically includes a word processor and spreadsheet application. These two programs allow businesses to create reports, memos, tutorials and even colorful ads for company events. Spreadsheet applications give businesses the chance to organize, manage and calculate both numeric and alphabetic data. With charts and graphs, reporting becomes visual instead of text-based.

Education

Businesses use computers to help educate employees on software, company policy, standard procedures and safety. Instead of hiring teachers, computers can be used to educate employees at their own pace or through an online webinar with live questions and answers. This form of education fits the busy schedules of businesses without sacrificing the quality of the education.

Task 2. Read the text below and choose the correct word for each space. For each question, put the correct letter A, B, C or D on your answer sheet.

Example:

0   ***A. world's***   *B. planet's*   *C. city's*   *D. country's*

HISTORY OF PERSONAL COMPUTER INDUSTRY

IBM, the (0) …..*A*…… dominant computer (16) ………. entered the computer market in 1981, when it introduced the IBM Personal Computer. The IBM PC was significantly (17) ………… than rival machines, had about 10 times their memory (18) ………... The IBM PC became the world's most popular personal computer, and both its microprocessor, the Intel 8088, and its (19) ………… system became industry standards. Rival machines that used Intel

microprocessors and MS-DOS became known as "IBM clones" and (20) …………. simply on the basis of low price.

In 1983 Apple introduced Lisa, a personal computer with a (21) …………. user interface. A GUI is a display format that allows the user to select (22) …………., start programs, and do other routine tasks by using a (23) …….. called a mouse to point to pictorial symbols – (24) ……….., or lists of menu choices on the (25) ……….. The Lisa's GUI became the basis of Apple's Macintosh personal computer, which was introduced in 1984 and proved extremely successful.

16	A. customer	B. manufacturer	C. consumer	D. buyer
17	A. fastest	B. fast	C. faster	D. more fast
18	A. capacity	B. ability	C. possibility	D. volume
19	A. ultimate	B. operation	C. operative	D. operating
20	A. struggled	B. competed	C. fought	D. combated
21	A. graffiti	B. graphical	C. graphic	D. ground
22	A. commands	B. directions	C. orders	D. asks
23	A. application	B. software	C. device	D. machine
24	A. windows	B. screens	C. images	D. icons
25	A. workplace	B. desk	C. screen	D. light

Task 3. Read the following sentences. For each question, complete the second sentence so that it means the same as the first. Use the given word in bold. Write only missing words on your answer sheet.
Example:0. There is a new swimming pool in our town.
   hasOur town .... a new swimming pool.
*Answer: 0.**has got***

1. The employees are obliged to follow safety rules at the workplace.
  toThe employees............................... safety rules at the workplace.
2. The function of CPU is to interpret codes.
  responsibleThe CPU .... interpreting codes.
3. Developers created an expert system to translate natural languages.
  wasAn expert system .... translate natural languages.
4. The company expanded, but it didn't analyze the risks.
  withoutThe company expanded .... the risks.
5. I couldn't make a transaction because the bank was closed.
  asI couldn't make a transaction .... closed.

Task 4. You work as Human Resources Manager at ABC Company. Your CEO has asked you to inform Mary Ann Stevenson, Research & Development Manager

about a meeting which will be held on December 20 at Meeting Hall#3. The topic of the meeting is discussion of a company`s strategy for the next year.

Write an e-mail of 40-60 words on your answer sheet.

Task 5. Write a piece of writing to one of the topics. Write your answer in about 120-150 words. Mark the topic number on your answer sheet.

Topic 1. This is a letter you have received from your customer.

Dear Sir or Madam,

I'm afraid that the enclosed CD with your program Easy View doesn't work. It is the third one I've had to return this month (see attached correspondence).

I bought the disk from ABC stores at Newtown, Big County on 5th of December. I was careful to follow the instructions for use, nevertheless, the disk failed to run.

Other than the three I've had to return recently, I've always found your products to be excellent.

I'd be grateful if you could send a replacement and refund my postage of £ 10.

I really appreciate your help.

Yours faithfully

Joan Smith

Now write a response to the letter, in which you apologize for the inconvenience and assure your customer that she will receive a replacement and a refund. Write your letter on your answer sheet.

Topic 2. Mr. John Crain, the owner of a university cybercafé, has asked you to make a questionnaire among customers about their satisfaction with service and prepare a report on its results. After questioning 50 visitors you have received the following results:

	Positive answers	*Negative answers*
Atmosphere	*45*	*5*
Food	*23*	*27*
Personnel	*14*	*36*
Internet facilities	*35*	*15*

Write a report in which you outline the situation and provide your recommendations.

Task 6. You will have to talk about the topic for one to two minutes. You have one minute to think about what you are going to say.

Explain how a computer has changed the way students study at universities.

You should say:

• What was the study like before PC became widespread.

• What are the advantages and disadvantages of computer use in the study.

• How you use a computer in your own learning process.

ACTIVITY PACK

UNIT 1. COMPUTER HARDWARE AND SOFTWARE

Task 1. **Pre-Assessment**

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

The first computer was invented by…. (Babbage/ Zuse / Sheutz / Pascal…). In course of time, computers have become … (cheaper / more expensive / smarter / more complicated / smaller / more popular / simpler …).
I think that the most important breakthrough in computer development is the invention of … (punch card data storage / first calculator / relay / transistors …).

Analytical Concern

The first computer was invented because … (people needed to count more quickly / people wanted to create music / there was a need to develop technology …).
If computer wasn't invented, people would have … (invented some other kind of calculating machine / stayed at the same level of development / created more harmonious society …).
I think that ….. (users / manufacturers / politics / merchandisers …) benefit most from the existence of computers.

Practical Concern

We can use computer for … (calculating / drawing / writing / playing games / developing a project / communication …).
The main parts of a computer are …(hard drive/ keyboard / motherboard…).
I think that the most useful software is … (Microsoft Office / Windows / Skype / Corel Draw / Photoshop …).

Creative Concern

The computer mouse is called that way because … (it resembles mouse / it is small / it moves quickly / it is just a funny word …).
We can use computer programs to … (create cards / write books / edit photos / compose videos …).
Broken keyboard may be used to … (create magnets from keys / create necklace from keys /sprout seeds …).

UNIT 2. PROGRAMMING

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

I suppose that programming was …. To my mind, the main breakthrough was the introduction of… Nowadays programming is …

Practical Concern

I know such languages as … I have an experience using … Nowadays people use programming in various fields, such as …

Analytical Concern

There are three main classes (generations) of programming languages … The criteria of such classification is the degree of … I suppose, that technology would have been absolutely different …

Creative Concern

Programming can be used in various creative ways ... Programming can be used to compose music … With the help of programming software engineers create computer games…

UNIT 3. EXPERT SYSTEMS

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

Computer can perform a lot of complicated tasks, such as calculation, design…. To my mind, it is (not) rational to trust a computer in the sphere of health care, because … I think that computer analysis is better that human expertise when …

Practical Concern

The term "expert system" means any system that can… Expert systems are a branch of AI which… AI devices are widely used in …

Analytical Concern

The advantages of computer analysis are that… The disadvantage is that computer analysis… I suppose, that computer analysis without human interference can be used in the spheres of…

Creative Concern

Sci-fi writers often mention AI technologies... It would be beneficial if AI was used in kitchen devices/ hair dryer because in this way… In 20 years AI technologies will develop/be used in every sphere…

UNIT 4. COMPUTER NETWORKS

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

Computer networks have huge/great/no impact on…The benefits of computer networks include……I suppose that the drawbacks of computer networks are ……

Analytical Concern

I think that in future computer networks will…When establishing home network, we must take into account the following …. The risks of having your own computer network include…….

Practical Concern

I use such computer networks as…I think that characteristics of computer networks are … To use computer networking technology, we need to...

Creative Concern

I associate with computer networks such concepts as…. The work of computer networks may be illustrated in the following way….. I suppose that computer networks are called that way because ….

UNIT 5. THE INTERNET

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

The Internet is a global network… the Internet was created in… The Internet proved to be beneficial in …

Analytical Concern

The Internet has changed dramatically… The Internet has reshaped such activities as … I suppose in future the Internet will …

Practical Concern

I usually use the Internet for… My favourite site is… Many professions are closely connected with the Internet, such as…

Creative Concern

The Internet may be used in entertainment to …Artists may use the Internet to … I suppose, the Internet has influenced modern art in …

UNIT 6. BUSINESS AND ENTERPRISE

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

I would prefer to work for a large corporation/ in a family business because…The benefits of running your own business include……I would like to work as a freelancer/employer because……

Analytical Concern

The good points of being a freelancer are…On the other hand, ….Before you set up your business, you should analyze…. The risks of running a business are …….

Practical Concern

I suppose that the most important industry of our country is…There are good and bad points of being a sole proprietor, like… To become a businessman, one should have...

Creative Concern

If I had a business, it would…. Creative industries include design ….. The good advertisement was made to promote….

UNIT 7. BANKING

Task 1. **Pre-Assessment**

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

I suppose that a bank is a financial institution that …Banks can make money in different ways, for example …… The risks of online banking include ……

Analytical Concern

The advantages of having a saving account are… On the other hand, … Before you choose a bank to work with, you should analyze… The pros of online banking include… Nevertheless…

Practical Concern

There are many banks in our country, for example…I suppose, the most popular banks are …Banks usually offer such types of accounts as...

Creative Concern

In my opinion, a perfect bank should … Friendly atmosphere in a bank can … Advertising campaign is very important in banking. Banks can outline their...

UNIT 8. MARKET AND COMPETITION

Task 1. **Pre-Assessment**

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

I suppose that competition is a market structure in which there is … I suppose that competition positively influences the market, as …… If there is no competition, the market structure will become ……

Analytical Concern

The winner in competition is determined by… In a perfectly competitive market, there is … An example of a perfectly competitive market is …

Practical Concern

Before buying a product I usually take into account such criteria as… When choosing between two similar products, I analyze … A monopolistic market is a kind of market where ...

Creative Concern

In my opinion, advertizing plays important role in… Nowadays effective advertizing should have such features as … If I had business, I would...

UNIT 9. ARITHMETIC AND NUMBER THEORY

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

Arithmetic is a branch of science which… Arithmetic first emerged in… Common arithmetic operations include …

Analytical Concern

Arithmetic is widely used in analysis of … Doing business often includes dealing with Arithmetic, for example … Number theory can be used in …

Practical Concern

Arithmetic is used in many spheres, such as… I suppose, the first purpose of calculation was … Arithmetic is often used by people who work as …

Creative Concern

Arithmetic may be used in …Arithmetic was mentioned in such books as … I think that the phrase 'Arithmetic of Art' means …

UNIT 10. DISCRETE MATHEMATICS

Task 1. Pre-Assessment

Here are the scaffolds you may use to answer questions from the Pre-Assessment task of Whole-Class Activity section.

RATIONAL CONCERN

I suppose that most useful topics of Discrete Math are…. To my mind, the hardest topic is, probably, … Discrete Mathematics can be applied in such spheres of everyday life as …

Practical Concern

Discrete Mathematics can have many practical applications, like… Discrete Math can help to solve many tasks, such as … I suppose, Discrete Mathematics is most needed in the spheres of …

Analytical Concern

Discrete Mathematics is … The difference between Discrete Mathematics and Algebra lies in … I suppose, Discrete Mathematics has many applications in business, such as …

Creative Concern

In my opinion, the most interesting topic of Discrete Math is... I associate Discrete Mathematics with … Discrete Mathematics may be used to…

WORKBOOK

UNIT 1. COMPUTER HARDWARE AND SOFTWARE

Task 1. Tiered Task

Part 1. Insert the following words in the gaps. Translate the sentences into your native language.

Pixels	photo-editing program	stored	flash memory
Upload	word-processing program	LCD screens	unit

1. Data is ……. on the disk until it is ready to use.
2. Nowadays we use ……. instead of CDs.
3. Choose the photo which you want to ………
4. …… allows you to create and modify text documents.
5. You can make your photo brighter using ……..
6. The processing …… carries out arithmetic and logic operations.
7. …… are used in a wide range of applications.
8. Resolution is the number of distinct …… in each dimension that can be displayed.

Part 2. Fill in the gaps with one to three words from the unit.

The operating system is the most important program that (1) …… on a computer. Every general-purpose computer must have an operating system to run other programs. Operating systems (2) …… basic tasks, such as recognizing (3) …… from the keyboard, sending (4) …… to the display screen, keeping track of (5) …… and directories on the disk, and controlling (6) …… devices such as disk drives and printers.

As a user, you normally (7) …… with the operating system through a set of (7) … . For example, the DOS operating system contains commands such as COPY and RENAME. (8) …… allow you to enter commands by pointing and clicking at objects that appear on the (9) …… .[105]

Part 3. Imagine that you work in a technical support office. You have been asked to give written instructions on how to solve problems from Task 9 of the Coursebook (PC is running slowly / Internet is slow or not loading). Write instructions using 100 words.

Task 2. Tiered Task

Read the text[106] about three most popular operating systems and complete any part of the task after reading.

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[105] The text is borrowed and modified from http://www.webopedia.com/TERM/O/operating_system.html as of 28th December 2012.

[106] The text is borrowed and modified from http://www.spamlaws.com/operating-system-comparison.html as of 28th December 2012.

Linux

The Linux operating system is developed on a kernel based on Unix. It is known as one of the most secure platforms, yet Linux is often viewed as more complex. Linux is the result of an open-source project, allowing users and developers to access the source code for free. Because it requires less hardware, Linux is capable of providing exceptional performance even on a smaller hard disk. Large communities of users exist for this system, constantly contributing to the code and making improvements. The server-based concept of Linux has resulted in fewer home users and a lack of multimedia support for the system.

Mac OS X

Mac OS X is Apple's trademark operating system software for their line of Macintosh computers. The system was based in part on Unix and mimics it's format with the administrative controls. Mac OS X software requires a low level of maintenance with fewer occurrences of computers worms, viruses and spyware. The Apple operating system does have some disadvantages, primarily in regard to software and hardware compatibility.

Windows

The Microsoft Windows operating system is the most popular choice and currently has a stronghold over the market. This platform has made significant advancements from version 1.0 all the way to the new Windows 8 system. The Windows system is highly compatible, feature-rich and has a much larger selection of software applications. Unlike the Linux kernel, Windows is proprietary software and tends to be more expensive than others. Despite widespread usage, Windows has been heavily associated with the term "insecure" as a number of security vulnerabilities have made it the most targeted system. Frequently exploited by hackers and malicious code writers, it is recommended that any Windows operating system with internet access be protected by some form of security software.

Part 1. Decide whether the following statements are true (T) or false (F). Justify your answer.

1. Linux and Mac OS X are both developed on the basis of Unix.　☐
2. Linux is free of charge.　☐
3. Everyone can make improvements to the Linux OS.　☐
4. Most programs are compatible with Mac OS X.　☐
5. Windows OS has the largest number of software applications.　☐
6. Windows OS is the most vulnerable system.　☐

Part 2. Fill in the table with the advantages and disadvantages of the systems.

	Advantages	**Disadvantages**
Linux	*1.One of the most secure platforms* *2.…*	*1.More complex OS* *2.…*
Mac OS X		
Windows		

Part 3. In writing, compare two of the operating systems in terms of:

- popularity;
- complexity;
- price;
- security;
- compatibility;
- software.

You may use the following expressions:
On the one hand…   *Unlike … ,*
On the other hand …   *Similar to …,*
In comparison with …   *What makes … different, …*

Task 3. Internet Search

Using the sites recommended by your teacher and any sites that you can find yourself, try to find some additional information about computer systems in English. The search should be done in pairs. Be ready to report your findings to the class.

Task 4. Find a user guide for any of your home devices and bring it to the next class.

Task 5. Writing

Having revised the material which you learned during the lesson, complete one of the following parts:

Part 1. Write a short manual (80-100 words) for a wireless optical mouse. You may use the materials which you worked out during the class as an example. Follow the plan:

➢ *Preface, where you present the device, give its name and purpose*
➢ *Guide on how to connect the mouse to the computer*
➢ *Warnings about where and how the device should not be used*
➢ *Section, where you give contact details.*

Part 2. Write a manual (100-120 words) for an inkjet printer. Use the following plan:

➢ *Preface*
➢ *Guide on how to connect the device*
➢ *Guide on how to install the drivers*
➢ *Warnings about where and how the device should not be used*
➢ *Troubleshooting section, where you give possible problems with device and explain how to fix them*
➢ *Section, where you give contact details.*

Part 3. Write a user guide for an MP3 player, using the following plan.

➢ *Preface*
➢ *Guide on how to use the device*
➢ *Guide on the main functions of a device*
➢ *Warnings about where and how the device should not be used*
➢ *Troubleshooting section, where you give possible problems with device and explain how to fix them*
➢ *FAQ, where you give answers to the questions which may occur while using the device*
➢ *Section, where you give contact details.*

UNIT 2. PROGRAMMING

Task 1. Tiered Task

Part 1. Insert the following words / phrases in the gaps. Translate the sentences into your native language.

perform	compare	machine language	interact
subtract	convert	high-level language	develop

1. While easily understood by computers, ………….. is almost impossible for humans to use because it consists entirely of numbers.
2. It is very important to ………… user-friendly interface and make software easy to use.
3. If you ………… 2 from 7, the answer is 5.
4. CPU can ………….. various operations very fast which makes it a useful tool in many human activities.
5. Programs written in ……………. are translated into assembly language by a compiler.
6. GUI allows users to ………… with electronic devices using images rather than text commands.
7. When you ………. a file, the copy of it will appear on the desktop.
8. It is hard to ………….. modern programming languages with machine code.

Part 2. Replace the words in bold with their synonyms.

1. The process of software development includes such **stages** as program writing, compiling, running and debugging.
2. Unlike modern devices, the earliest computers were **huge** building-sized machines.
3. Several versions of the program were launched after the **initial** release.
4. Today, most people don't need to know how a computer **works**.
5. In assembler, the operations that the microprocessor **performs** are given names.
6. **Instructions** written in high-level languages are converted into machine code with the help of compiler.
7. Nowadays the term refers purely to fixing **bugs** and problems in source code of the program.
8. Programming is **breaking** a task **down** into small steps.

Part 3. Fill in the gaps with the derivatives of the words in capitals.

A programming language is used to write computer programs and 1) ……..................... A program is written as a series of human 2) ……..................... computer commands that can be read by a 3) ………… and translated into machine code so that a computer can run it. From the moment you turn on your computer, it is running programs and carrying out 4)…………... Each and every 5)……………..that your computer performs has instructions that someone had to write in a 6) …………..language. Nowadays such languages, as Java and C++ with C# are continuing to gain7)…………... There have been many attempts to automate this process, and have computers write computer programs but the 8) ……………..is such that for now, humans still write the best computer programs.[107]	APPLY UNDERSTAND COMPILE INSTRUCT OPERATE PROGRAM POPULAR COMPLEX

Task 2. Tiered Task

Read the text and do at least one part of the task after reading.[108]

The Tower of Babel – A Comparison of Programming Languages

These days, programming languages are becoming more and more general and all-purpose, but they still have their specializations, and each language has its disadvantages and advantages. Here is the comparison of the most popular programming languages.

C++ is well-suited for large projects because it has an object-oriented structure. People can collaborate on one program by breaking it down into parts and having a small group or even one individual work on each part. The object-oriented structure also allows code to be reused a lot, which can cut down development time. C++ is also a fairly efficient language – although many C programmers will disagree.

C is a popular language, especially in game programming, because it doesn't have the extra packaging of the object-oriented C++. Programmers use C because it makes programs faster and smaller than programs written in C++. You might wonder, however, whether it's worth giving up the reusability of C++ to get the

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[107] The text is borrowed and modified from http://cplus.about.com/od/introductiontoprogramming/p/programming.htm as of 4th April, 2013.

[108] The text is borrowed and modified from http://www.cprogramming.com/langs.html as of 14th April, 2013.

small increase in performance with C, especially when C++ can, where necessary, be written in a C programming style.

Pascal is primarily a teaching language. Few industrial programs are written in Pascal. Pascal tends to use keywords instead of braces and symbols, so it is a bit easier for beginners to understand than languages like C++. Still, not everyone thinks Pascal is just for the schools. Borland, the huge compiler software company, has been pushing Delphi, which is an object-oriented version of Pascal, as an industrial strength programming language.

Fortran is a number-crunching program, and it is still used by scientists because the language allows variables of any size up to the memory limit of the machine. Fortran is especially convenient for engineers, who have to mathematically model and compute values to high precision. Fortran, however, isn't nearly as flexible as C or C++. Programming in Fortran is rigid and has strict rules, which sometimes makes reading Fortran programs difficult.

Java is a multi-platform language that is especially useful in networking. Of course, the most famous usage of Java is on the web, with Java applets, but Java is also used to build cross-platform programs that stand alone. Since it resembles C++ in syntax and structure, learning Java is usually quite easy for most C++ programmers. Java offers the advantages provided by object-oriented programming, such as reusability; on the other hand, it can be difficult to write highly efficient code in Java, and Swing, its primary user interface, is notoriously slow. Nevertheless, Java has increased in speed in recent years, and version 1.5 offers some new features for making programming easier.

Part 1. Compare C++ with other programming languages and tick the language which is better in the following aspects. Justify your answer.

		C ++	C
1	Efficacy		✓
2	Performance		
3	Reusability		
	---------------------------	C ++	Pascal
4	Easiness		
5	Prevalence		
	---------------------------	C ++	Fortran
6	Flexibility		
	---------------------------	C ++	Java
7	Speed		
8	Easiness		

Part 2. Fill in the table with the information from the text.

#	Programming language	Sphere of Use	Advantages	Disadvantages
1	C ++	Large projects	Reusability, ...	Less efficient than C
2	C			
3	Pascal			
4	Fortran			
5	Java			

Part 3. Write your own short description of any programming language, which wasn't mentioned in the text.

Task 3. Internet Search

Visit the following link http://www.youtube.com/watch?v=DBXZWB_dNsw, or find any other source of information about prodigy programmers and be ready to retell their story. Mention the following information:

1. Name, country;
2. Age, education;
3. Field of interests;
4. Personality;
5. Story of programming success.

Task 4. Writing

Imagine that you are offered to test a better version of a new online game.

Part 1. Create a test case to ensure that you can log in a system.

Part 2. Create a test case to ensure that you can create an account in the system.

Part 3. Create a test case to ensure that you can receive a reminder of your password if you have forgotten one.

Remember that your test case should contain the following parts:

- case ID;
- test case description;
- related requirements (equipment, environment);
- author;
- test step or order of execution number;
- expected result;
- pass / fail.

UNIT 3. EXPERT SYSTEMS

Task 1. Tiered Task

Part 1. Insert the following words in the gaps. Translate the sentences into your native language.

expressed	based	translate	provides
reasons	adapted	simulate	

1. Expert systems aim to .... human reasoning.
2. To run an expert system, the engine ......about the knowledge base like a human.
3. The knowledge base is ....with natural language rules.
4. Each rule style is .... to an engine style.
5. In order to produce a reasoning, an inference engine should be ....on logic.
6. Expert systems have been built to find mineral deposits and ....natural languages.
7. The user .... data and receives results immediately.

Part 2. Fill in the gaps.

Expert system is a computer program that uses artificial (1) .... to solve problems within a specialized domain that ordinarily requires human expertise. The first expert system was (2) .... in 1965 by Edward Feigenbaum and Joshua Lederberg of Stanford University in California, U.S. Dendral, as their expert system was later known, was designed to (3) .... chemical compounds. Expert systems now have commercial (4) .... in fields as diverse as medical diagnosis, petroleum engineering, and financial investing.

In order to accomplish feats of apparent intelligence, an expert system relies on two (5) ....: a knowledge base and an inference (6) .... A knowledge base is an organized collection of (7) .... about the system's domain. An inference engine (8) .... the facts in the knowledge base in order to provide an answer. Typical tasks for expert systems involve (9) ...., diagnosis, monitoring, design, scheduling, and planning for specialized endeavours.[109]

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[109] The text is borrowed and modified from http://www.britannica.com/EBchecked/topic/198506/expert-system as of 1st June, 2013.

Part 3. Write a short description (5-6 sentences) of the way an expert system works. You may use the scheme from Task 6 as a scaffold.

Task 2. Tiered Task

Read the text and do at least one part of the task after reading[110].

In 1950, Alan Turing published his famous article "Computing Machinery and Intelligence", which proposed what is now called the Turing test as a criterion of intelligence. This criterion depends on the ability of a computer program to act as a human in a real-time written conversation with a human judge, sufficiently well that the judge is unable to distinguish reliably between the program and a real human. The notoriety of Turing's proposed test stimulated great interest in Joseph Weizenbaum's program ELIZA, published in 1966, which seemed to be able to fool users into believing that they were conversing with a real human.

ELIZA's key method of operation (copied by chatbot designers ever since) involves the recognition of cue words or phrases in the input, and giving the output of corresponding pre-programmed responses that can move the conversation forward in a meaningful way (e.g. by responding to any input that contains the word 'MOTHER' with 'TELL ME MORE ABOUT YOUR FAMILY'). Thus an illusion of understanding is generated, even though the processing involved has been merely superficial. The key technique here is the production of responses that are sufficiently vague that they *can be understood* as "intelligent" in a wide range of conversational contexts.

Another example of a chatbot is **Cleverbot** – a web application that uses an artificial intelligence algorithm to converse with humans. It was created in 1997 by AI scientist Rollo Carpenter, who also created Jabberwacky, a similar web application.

Unlike other chatbots, Cleverbot's responses are not programmed. Instead, it "learns" from human input. Humans type into the box and the system finds all keywords or an exact phrase matching the input. After searching through its saved conversations, it responds to the input by finding how a human responded to that input when it was asked, in part or in full, by Cleverbot. Cleverbot participated in a formal, Turing Test at the 2011 Technische festival. Out of the 334 votes cast, Cleverbot was judged to be 59.3 % human, compared to the rating of 63.3 % human achieved by human participants. A score of 50.05 % or higher is often considered to be a passing grade.

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[110] The text is borrowed and modified from http://en.wikipedia.org/wiki/Cleverbot and http://en.wikipedia.org/wiki/Chatterbot as of 1st June, 2013.

Chatbots are often integrated into the dialog systems of, for example, automated online assistants, giving them the ability of, for example, small talking or engaging in casual conversations. Large companies such as Lloyds Banking Group, Royal Bank of Scotland, Renault and Citroën are now using automated online assistants instead of call centres with humans to provide a first point of contact.

Part 1. Answer the following questions.

1. What is the aim of the Turing test?
    b. To test the ability of a computer to participate in written communication.
    c. To test the ability of a computer to act as a human.
    d. To distinguish reliably between a computer and a human.
2. Joseph Weizenbaum's program ELIZA…
    b. seemed to perform well at the Turing test.
    c. wasn't able to converse with people.
    d. was fooling people all the time.
3. What is ELIZAs key method of operation?
    a. Creation of an intelligent conversation.
    b. Production of endless responses.
    c. Recognition of the cue words and giving pre-programmed responses.
4. Rollo Carpenter created Jabberwacky, which is…
    a. another example of a chatbox.
    b. application simulating the web.
    c. AI science.
5. How does Cleverbot create its responses?
    a. It gives pre-programmed responses.
    b. It searches through previous human responses and gives the matching phrase.
    c. It creates the response using a complicated algorithm.

Part 2. Compare the two chatboxes – ELIZA and Cleverbot using the table below:

Name	ELIZA	Cleverbot
Date of creation		
Developer		
Turing test performance		
Key method of operation		

Part 3. In writing, give your own definition of a chatbot. How have the principles of a chatbot operation changed over time? Where can a chatbot be used? Give your own examples and ideas.

Task 3. Internet Search

Visit a Cleverbot site (http://www.cleverbot.com/) or any other chatbot and prepare to tell about your conversation. How would you rate the chatbot according to Turing test scale (%)? What are the weak and strong points of a conversation?

Task 4. Writing

Write your own CV for a System Analyst position. Keep in mind all the requirements you have learned and discussed in class.

Part 1. In your CV include the following information:

➢ Personal information;
➢ Profile;
➢ Skills and competences;
➢ Education;
➢ Interests.

Part 2. In your CV include the following information:

➢ Personal information;
➢ Profile;
➢ Summary of qualifications;
➢ Technical skills;
➢ Work experience (you may make up your previous job positions if you don't have any);
➢ Education;
➢ Interests.

Part 3. In your CV include the following information:

➢ Personal information;
➢ Profile;
➢ Summary of qualifications;
➢ Technical skills;
➢ Work experience (you may make up your previous job positions and your responsibilities there if you don't have any);
➢ Education;
➢ Interests;
➢ Notable achievements.

UNIT 4. COMPUTER NETWORKS

Task 1. Tiered Task

Part 1. Read the sentences and choose one appropriate word from the options. Explain the difference.

1. Computer networks allow computers to ………… data.
   a. change   b. split   c. exchange
2. Computer devices that originate, route and terminate the data are called ……….
   a. servers   b. nodes   c. hosts
3. Computer networks ………….. interpersonal communications.
   a. complicate   b. facilitate   c. substitute
4. People can communicate effectively via ………… messaging.
   a. instant   b. moment   c. quick
5. Users may access and use resources provided by ……….. devices on the network.
   a. split   b. divided   c. shared
6. Computer networks may be ………… because they may be used by hackers.
   a. insecure   b. protected   c. violent
7. A complex computer network may be difficult to ………….. .
   a. start   b. set up   c. make
8. Power line communication strongly ………….. certain forms of radio communication.
   a. burden   b. damage   c. disturb

Part 2. Put the words in the correct order and make up sentences.

1. Networks / exchange / computer / allow / to / computers / data.
2. Hosts / hardware / nodes / and / include / can / networking.
3. Networks / interpersonal / facilitate / computer / communication.
4. May / information / on / authorized / access / stored / other / users / computers.
5. Network / by / hackers / computer (x2)/ may / used / deploy / be / to / viruses.
6. Be / set / computer / may / up / complex / network / difficult / to.

Part 3. Fill in the gaps with the words from the Unit.

Networks are (1) ………….. of computers, software, and hardware that are all connected to help their (2) ………… work together. A network (3) ……….. computers by means of (4) ……….. systems, specialized software, and devices that (5) ………. data traffic. A network enables users to (6) ………. files and

247

resources, such as printers, as well as (7)……… messages electronically (e-mail) to each other.

Computer networks (8) …………. two main types: client / server networks and peer-to-peer networks. A client/server network uses one or more dedicated machines (the (9) …………) to share the files, printers, and (10) ………….. A peer-to-peer network (11) ………. any user to share files with any other user and doesn't (12) ……….. a central, dedicated server.

The most common networks are (13) ……….. Area Networks or LANs for short. A LAN connects computers within a single geographical location, such as one office building, office suite, or home. By contrast, (14)………… Area Networks (WANs) span different cities or even countries, using (15) ……….. or satellite links.[111]

Task 2. Tiered Task

Read the text and do at least one part of the task after reading.

Firewall Security

In computing, a firewall is a software or hardware-based network security system that controls the incoming and outgoing network traffic by analysing the data packets and determining whether they should be allowed through or not, based on applied rule set. A firewall establishes a barrier between a trusted, secure internal network and another network (e.g., the Internet) that is not assumed to be secure and trusted.

Many personal computer operating systems include software-based firewalls to protect against threats from the public Internet. Many routers that pass data between networks contain firewall components and, conversely, many firewalls can perform basic routing functions. There are different types of firewalls depending on where the communication is taking place, where the communication is intercepted and the state that is being traced.

Network layer firewalls, also called packet filters, operate at a relatively low level of the TCP/IP protocol stack, not allowing packets to pass through the firewall unless they match the established rule set. The firewall administrator may define the rules; or default rules may apply.

Application-layer firewalls work on the application level of the TCP/IP stack (i.e., all browser traffic, or all telnet or ftp traffic), and may intercept all packets traveling to or from an application. They block other packets (usually dropping them without acknowledgment to the sender).

On inspecting all packets for improper content, firewalls can restrict or prevent the spread of networked computer worms and trojans. The additional inspection criteria can add extra latency to the forwarding of packets to their destination.

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[111] The text is borrowed and modified from http://tecschange.org/classic/networks/network-syllabus.html as of 22nd January, 2014.

A proxy server (running either on dedicated hardware or as software on a general-purpose machine) may act as a firewall by responding to input packets (connection requests, for example) in the manner of an application, while blocking other packets. A proxy server is a gateway from one network to another for a specific network application, in the sense that it functions as a proxy on behalf of the network user.[112]

Part 1. Mark the statements as true (T) or false (F).

1. Firewall is a hardware-based network security system that controls the incoming and outgoing network traffic.   □
2. A firewall establishes a barrier between a secure internal network and another network.   □
3. Firewalls are not able to perform basic routing functions.   □
4. Packet filters, operate at a high level.   □
5. Packet filters allow packets to pass through the firewall if they match the established rule set.   □
6. Application-layer firewalls may intercept all packets travelling to or from an application.   □
7. Firewalls cannot restrict the spread of networked computer worms.   □
8. A proxy server is a gateway from one network to another for a specific network application.   □

Part 2. Answer the following questions:

1. What is a firewall?
2. What functions does it perform?
3. What are the criteria of firewalls` classification?
4. How does a network layer firewall operate?
5. How does an application-layer firewall operate?
6. What is a proxy server?

Part 3. In writing, explain the difference between different level firewalls` operation.

Task 3. Internet Search

Search through the Internet for information about the history of computer networks development. Stress the milestones and key reasons for technological advances.

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[112] The text is borrowed and modified from http://www.wisegeek.com/what-is-a-competitive-marketing-strategy.htm as of 20th January, 2014.

Task 4. Writing

In the previous Unit you have already written your CV. Now, read the following job advertisement and write an application letter for the position of a System Analyst.[113] Your application letter should include:

- *Paragraph, where you explain what position you are interested in and where you have seen the advertisement*
- *Paragraph, where you present your skills and responsibilities*
- *Paragraph, where you present your reasons for wanting the job*
- *Closing paragraph*

Computer System Analyst

BNC Company is looking for a Computer Systems Analyst to join our team in our Newbury office. The ideal candidate will serve as an engineer on the Service Operations Team on a classified government contract. The individual selected to serve in this position will have a strong IT background and an aptitude to learn quickly. The ideal candidate will be able to solve problems rapidly and will have excellent communication skills for dealing with a wide array of diverse and demanding customers.

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[113] The text is borrowed and modified from
https://sjobs.brassring.com/TGWEbHost/jobdetails.aspx?partnerid=25037&siteid=5010&AReq=281280BR&codes=in-indeed as of 20th January, 2014.

UNIT 5. THE INTERNET

Task 1. Tiered Task

Part 1. Insert the following words in the gaps. Translate the sentences into your native language.

resources	hyperlinks	protocol	engines
services	system	browser	blogging

1. The Internet is a global …………..of interconnected computer networks.
2. The standard Internet ………… suite (TCP/IP) is used to serve several billion users worldwide.
3. The Internet carries an extensive range of information …………..and services, such as the inter-linked hypertext documents of the World Wide Web.
4. Print publishing can either adapt to website technology, or be reshaped into ………….. and web feeds.
5. The Web is a global set of documents, images and other resources, logically interrelated by …………. and referenced with Uniform Resource Identifiers.
6. The Internet research is usually done using keyword-driven search ………...
7. Wide Web …………. software, such as Microsoft's Internet Explorer, Mozilla Firefox, Opera, Apple's Safari, and Google Chrome, lets users navigate from one web page to another.
8. Over a third of the world's human population – have used the ………… of the Internet.

Part 2. Fill in the gaps with the words from the Unit.

The World Wide Web, or simply Web, is a way of accessing (1) ……….. over the medium of the Internet. It is an information-sharing (2) ……….. that is built on top of the Internet. The Web uses the HTTP (3) …………, only one of the languages spoken over the Internet, to transmit data. Web services, which use HTTP to allow applications to (4) …………… in order to exchange business logic, use the Web to (5) …………. information. The Web also utilizes (6) …………. , such as Internet Explorer or Firefox, to access Web documents called Web pages that are linked to each other via (7) …………... Web documents also contain graphics, sounds, text and video.

The Web is just one of the (8) ………. that information can be disseminated over the Internet. The Internet, not the Web, is also used for e-mail, which relies on SMTP, Usenet news groups, instant (9) …………. and FTP. So the Web is just a

portion of the Internet, albeit a large portion, but the two terms are not (10) ………….. and should not be confused.[114]

Part 3. Fill in the gaps with the words derived from the words in capitals.[115]

The (1) ………… of the World Wide Web was begun in 1989 by Tim Berners-Lee and his colleagues at CERN, an international scientific (2) ………. based in Geneva, Switz. They created a protocol, Hyper Text Transfer Protocol (HTTP), which (3) …………… communication between servers and clients. Their text-based Web (4) ……….. was made available for general release in January 1992. The World Wide Web gained rapid acceptance with the (5) ……….. of a Web browser called Mosaic, which was developed in the United States in September 1993. Mosaic allowed people using the Web to use the same sort of "point-and-click" (6)………….. (7) …………….. that had been available in personal computers for some years. In April 1994 Andreessen cofounded Netscape Communications Corporation, whose Netscape Navigator became the (8) ………….. Web browser soon after its release in December 1994. By the mid-1990s the World Wide Web had millions of active (9) …………. .	**DEVELOP** **ORGANIZE** **STANSARD** **BROWSE** **CREATE** **GRAPH** **MANIPULATE** **DOMINATE** **USE**

Task 2. Tiered Task

Read the text about the most popular websites and complete at least one part of the task.

Part 1. Look at the list of top 10 most popular websites and fill in the gaps (1-10) with the names of the websites from the following table:

facebook.com   wikipedia.org   msn.com   youtube.com   bing.com

amazon.com   google.com   twitter.com   ebay.com   yahoo.com

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[114] The text is borrowed and modified from http://www.webopedia.com/DidYouKnow/Internet/Web_vs_Internet.asp as of 1st February 2014.

[115] The text is borrowed and modified from http://www.britannica.com/EBchecked/topic/649051/World-Wide-Web-WWW as of 1st February 2014.

Part 2. Classify the sites into the following categories:

Search:

………………………………………………………………………………

Social Networking:

………………………………………………………………………………

Video-Sharing:

………………………………………………………………………………

Commerce:

………………………………………………………………………………

Reference:

………………………………………………………………………..………..

Part 3. Create your own top 5 list of your favourite websites. In short, describe each website in terms of their aim, category, audience etc.

Top 10 Most Popular Websites[116]

Here are the 10 Most Popular Sites *(English Language)* as derived from *eBizMBA Rank* which is a constantly updated average of each website's Global Traffic Rank of February 2014.

1 _____

Enables users to search the world's information, including webpages, images, and videos. Offers unique features and search technology.

2 _____

A way to get your videos to the people who matter to you. Upload, tag and share your videos worldwide!

3 _____

A social utility that connects people, to keep up with friends, upload photos, share links and videos.

4 _____

A major internet portal and service provider offering search results, customizable content, chatrooms, free e-mail, clubs, and pager.

5 _____

A customer-centric company, where customers can find and discover anything they might want to buy online, and endeavours to offer its customers the lowest possible prices. Site has numerous personalization features and services including one-click buying, extensive customer and editorial product

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[116] The text is borrowed and modified from http://www.ebizmba.com/articles/most-popular-websites and http://www.alexa.com/topsites/countries/US as of 2nd February 2014.

reviews, gift registries, gift certificates, wish lists, restaurant and movie listings, travel, and photo processing.

6 _____

A free encyclopaedia built collaboratively using wiki software. (Creative Commons Attribution-ShareAlike License).

7 _____

International person to person auction site, with products sorted into categories.

8 _____

Social networking and microblogging service utilising instant messaging, SMS or a web interface.

9 _____

Search engine developed by Microsoft. Features web, image, video, local, news, and product search.

10 _____

Portal for shopping, news and money, e-mail, search, and chat.

Task 3. Internet Search.

Using the Internet, find the information about any sites and Internet resources you find interesting. Describe the site you like in terms of topic, design, functions, audience. Be ready to report your findings to the class.

Task 4. Writing

Having revised the material which you learned during the lesson, complete one of the following parts of the task:

Part 1. Imagine that you are the CEO of LJS Company. Write a memo to the Heads of Departments, in which you inform them about the upcoming Company Strategy Meeting. Write about the place and time of the meeting.

Part 2. Imagine that you are the Human Resources Manager of LJS Company. Write a memo to all employees, in which you inform them about an upcoming conference "The Future of Information Technology". In your memo, write about the time, place and agenda of the conference.

Part 3. Imagine that you are the CEO of LJS Company. Write a memo to all employees, in which you inform them about a reorganization of your company. Describe the changes that will be made and explain the importance of these measures.

UNIT 6. BUSINESS AND ENTERPRISE

Task 1. Tiered Task

Part 1. Match the words (1-6) with the pictures (a-f).

1. Corporation   2. Consumer   3. Sole proprietor
4. Profit   5. Partnership   6. Board of directors

a

b.

c.

d.

e.

f.

Part 2. Solve the clues and complete the puzzle.

1. A business organization that makes, buys, or sells goods or provides services in exchange for money.

2. Legal right to the possession of a thing.

3. A large company or group of companies authorized to act as a single entity.

4. A person or company that provides goods / or services to other companies

5. A financial gain, benefit.

6. A commercial activity.

7. An owner of shares in a company.

8. A merchant who sells goods in small quantities

9. Commodities, wares or products.

10. A head of a company.

11. Owner of a business, or a holder of property.
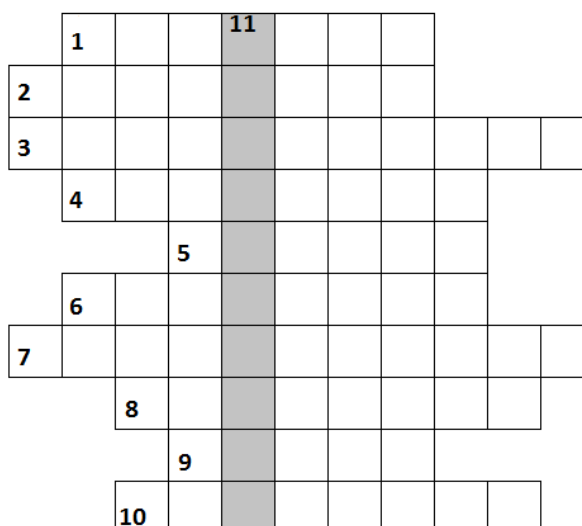
Part 3. Fill in each gap with one suitable word.

Samsung Electronics Co., Ltd. is a South Korean (1)………….. electronics (2)………… headquartered in Suwon, South Korea. It is the flagship (3)……….. of the Samsung Group and has been the world's largest information technology company by revenues since 2009. Samsung Electronics has assembly plants and sales (4) ………… in 88 countries and (5) ………. around 370,000 people. For 2012 the (6)…….. is Kwon Oh-Hyun.

Samsung has long been a major (7) …………… of electronic components such as lithium-ion batteries, semiconductors, chips, flash memory and hard drive devices for clients such as Apple, Sony, HTC and Nokia.

In recent years, the company has diversified into (8)……….. electronics. It is currently one of the world's largest manufacturers of mobile phones and smartphones fueled by the popularity of its Samsung Galaxy (9)………. of devices. The company is also a major (10)………… of tablet computers, particularly its Android-powered Samsung Galaxy Tab collection.[117]

Task 2. Tiered Task

Read the text and do at least one part of the task after reading.

The Disadvantages of Information Technology in Business

Information technology has changed the way that the world does business. Correspondence that once took weeks to get from one organization to another is now delivered instantly with the push of a button. Advances in telecommunication allow associates from all point of the globe to confer in a virtual environment, minimizing the need for business travel. Although the benefits of integrating information technology in business are many, there are also disadvantages to its use.

Every business must consider startup costs when implementing any type of information technology system. In addition to the cost of hardware and software, some technology vendors require businesses to purchase user licenses for each employee that will be operating the system. Businesses must examine the cost of training employees in unfamiliar technology. Although basic information technology systems may be user friendly, advanced programs still require formal instruction by an expert consultant.

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[117] The text is borrowed and modified from http://en.wikipedia.org/wiki/Samsung_Electronics as of 20th October, 2013.

In addition to the startup expenses, information technology systems are expensive to maintain. Systems malfunction, and when they do, businesses must engage skilled technicians to troubleshoot and make the necessary repairs. These expenses present a major disadvantage of information technology in business, particularly to businesses that are entering the technology era for the first time.

Implementing information technology into business operations can save a great deal of time during the completion of daily tasks. Paperwork is processed immediately, and financial transactions are automatically calculated. Although businesses may view this expediency as a boon, there are untoward effects to such levels of automation.

As technology improves, tasks that were formerly performed by human employees are now carried out by computer systems. For example, automated telephone answering systems have replaced live receptionists in many organizations. This leads to the elimination of jobs and, in some cases, alienation of clients. Unemployed specialists and once-loyal employees may have difficulty securing future employment.

The ability to store information in an electronic database facilitates quicker, more efficient communication. In the past, an individual would sift through stacks of paper records to retrieve data. With properly implemented technology, information can be recovered at the touch of a button.

Although information technology systems allow business to be conducted at a faster pace, they are not without their flaws. Information technology systems are vulnerable to security breaches, particularly when they are accessible via the Internet. If appropriate measures are not in place, unauthorized individuals may access confidential data. Information may be altered, permanently destroyed or used for unsavoury purposes.[118]

Part 1. Make up a plan of the text. For each paragraph, write a sentence which illustrates its main idea.

Part 2. Make a list of advantages and disadvantages of IT in business which were mentioned in the text.

Advantages   Disadvantages

……………………………….   ……………………………….

……………………………….   ……………………………….

……………………………….   ……………………………….

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[118] The text is borrowed and modified from http://smallbusiness.chron.com/disadvantages-information-technology-business-4020.html as of 20th October, 2013.

Part 3. Write your own list of advantages and disadvantages of IT in business which were not mentioned in the text. Name at least 3-5 points.

Task 3. Internet Search

Search through the Internet for information about a story of business success of any IT company. Prepare to report your findings to the class.

Task 4. Writing

Read the following situations and write the suggested letter of one of the parts.

Part 1. Letter of Appreciation

Congradulations! You completed your degree and got a well-paid job in your field. One of your instructors played an important role in your study and was especially helpful during searching for job period. He wrote an excellent recommendation letter and thus contributed into your obtaining of position.

Write a letter thanking your instructor. Remember to make your thanks specific and meaningful.

Part 2. Information Request

Your company, SmartAnalysis.com, has recently changed its headquarters and wants to hold company meeting in a new location. The CEO has asked you to find a suitable conference location for 100 employees and guests. He wants a company to host a three-day combination of open conference / advertising campaign at some prestige place in the city centre. He suggests you to start your investigation with Business Palace Compey. You've checked its website and decided to write to its manager to get some details.

You estimate that apart from large conference hall your company needs to book about 80 rooms for guests. You will also require three small conference rooms, technical facilities and catering service. The CEO plans to have a banquet for about 200 guests the last day of event. Althoug the planned period of conference is at off-peak time (January 14-20), you wonder wheter there will be enough room for the event. The CEO wants a report from you by November 23.

Write a well-organized information request to Mr. Jack Corns, Manager, Business Palace Compey, 24 High Road, Bronx, 34525.

Part 3. Winning back your customer

As the marketing manager of Hardware.com, you handle customer claims. Ms. Jenny Woodstrike is returning a monitor HR3453, a high-end, fully functional device, tailored specifically for graphic design works. She claims that the device has a scratch on the back panel and lacks special CD with drivers. She is very dissapointed and wants all her money back plus costs for shipping.

You suppose that the monitor was damaged during shipping because it was in a perfect condition when it was shipped. Nevertheless, the policy of your company is to comply with customer wishes.

Try to persuade Ms. Jenny Woodstrike to give your company another chance. Explain the reasons for the situation. Suggest that she can have the monitor with a large discount of 25 %. If that doesn`t suit her, propose a replacement of a monitor with another one of the same or different model.

Write to Ms. Jenny Woodstrike, Goodwill Street, 45, Bronx, HT234. Assure her that this situation will never happen again. Supply any nessecary information.

UNIT 7. BANKING

Task 1. Tiered Task

Part 1. Find the words from Unit 5 in the crossword puzzle. Translate the words into your native language.

O	V	E	R	D	R	A	F	T	L	O	A	N
V	E	F	E	E	Y	N	I	U	T	A	B	O
D	T	R	V	P	N	G	T	R	A	D	E	U
I	W	N	E	O	T	B	A	N	K	E	R	N
T	R	A	N	S	A	C	T	I	O	N	I	D
N	G	S	U	I	C	U	R	N	M	D	N	E
A	E	F	E	T	S	R	E	T	A	I	L	R
U	L	I	M	I	T	R	N	E	R	T	E	W
B	O	N	D	N	I	E	D	R	G	A	N	R
U	A	A	E	T	L	N	S	E	I	L	D	I
Y	N	N	B	R	K	C	M	S	N	I	T	T
W	R	C	I	O	B	Y	S	T	A	B	Y	E
F	E	E	T	D	E	G	C	R	E	D	I	T

Part 2. Read the sentences and choose one appropriate word from options in bold. Explain the difference.

1. As I needed money to buy a car, I decided to **borrow / lend** it from a bank.
2. Mary has opened a(n) **discount / account** with ABC Bank.
3. The salary appears as **credit / debit** on the bank statement.
4. Banks usually charge **percent / interest** on money they lend.
5. **Mortgage / overdraft** is a loan secured against property.
6. Investment banks can earn money by **underwriting / guaranteeing** company`s assets.
7. If a company has low annual revenue, its share prices may **raise / fell**.
8. By trading **coins / currencies** banks can take advantage and earn money on exchange rates.
9. Mortgage banks are specialized in providing mortgage **loans / debts**.
10. Investment banks provide advice on investment and promote corporate **operations / transactions**.

Part 3. Fill in each gap with one suitable word.

The very beginning of modern internet (1) ………. was back in the 1980s, when banking services were available over electronic (2)……….. for the first time. If you had a terminal, monitor and a phone line you could (3) ………... the banking system. You could also use a numeric keypad to send messages down the phone lines to your bank.

The early system (4) ……… bank customers to view their (5) ………… and their bill payments online. If you wanted to make a (6) ……… or pay a (7) ………., you would need to send a written set of instructions to the National Banks of Scotland which would then set up the details for you.

The internet continued to (8) ……… and evolve during the 1990s and more people than ever were buying home computers and getting online with dial-up (9) ………. in their own homes. The first bank to (10) ……… the modern style of online internet banking services through a web (11) ……….. , like we are used to today, was the Stanford Federal Credit Union in 1994.

In 2001, the Bank of America was the first bank in the world to reach 3 million online banking (12) ………. . Over the next ten years, online banking grew exponentially, and some banks appeared which only existed online! These banks were able to offer better (13) ………. rates, more features, and other services because they had the of not (14) ……….. having to maintain the expenses of brick and mortar bank buildings.[119]

Task 2. Tiered Task

Read the text and do at least one part of the task after reading.

Types of Bank Accounts

A bank account can be defined as a financial account between a financial institution and a bank customer. It is a channel through which a customer can entrust a bank with his/her funds and make withdrawals when need be. Banks usually offer different types of banking accounts to their customers without restricting their choice for a particular account type. The following are basic banking account types offered by a majority of banking institutions worldwide.

Chequing Accounts

This is an account that offers you comfortable and secure access to your account, especially if you need some money to cater for your transactional needs on a daily basis. It is a primary instrument used by majority of people for

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[119] The text is borrowed and modified from http://www.tech2date.com/the-history-of-internet-banking.html#sthash.CMieyS2I.dpuf as of 10th November, 2013.

withdrawing their funds. With this type of a bank account, you can transfer funds from your chequing account to another bank account in a different banking institution. Majority of people consider it as the most economical bank account type because it lacks monthly service fees.

Savings Accounts

The savings account is another bank account type that allows the account holder to amass interest on the funds deposited for future use. Interest is compounded on weekly, daily, annual and monthly basis. However, a savings account is not as flexible as the checking account because holders of savings account are limited to the amount of deposits and withdrawals they can make on monthly basis. Banking institutions do not allow holders of this bank account type to access their funds with cheques. However, they are allowed to withdraw and deposit money through their ATMs.

Certificates of Deposit Accounts (CDs)

A CDs account is in most cases referred to as Time deposit account. As the name suggests, a CDs account provides you with a platform to only invest your funds at a pre-set interest rate within a pre-set of time period. This means that you should agree to leave your funds in the account for a specific amount of time. The best thing with CDs accounts is that they have relatively higher interest rates compared to the traditional savings account. However, it is not one of the best bank account types you should open if you would like to access your money any time.

Money Market Bank Accounts

This bank account has a few similarities with savings account but it requires you to hold a certain minimum amount of money, otherwise you will be charged a monthly fee. This minimum is also required for your money to earn interest which is normally higher than that imposed on checking and savings accounts. Majority of money market accounts allow its holders to cash in cheques against their funds but on fixed basis.

Individual Retirement Accounts (IRA)

This type of a bank account lets you to save on your own for retirement. It is the best alternative if your employer doesn't provide a retirement benefits scheme or if you would like to save some more money for your retirement. Individual retirement account comes in two other types namely; Roth IRA and traditional

IRA. However, the former is more popular because cash withdrawals can be done tax-free.[120]

Part 1. Match the types of bank accounts (1-6) with their definitions (a-f).

1. Bank account	a. An account type that allows the account holder to amass interest on the funds deposited for future use
2. Chequing account	b. An account that provides you with a platform to only invest your funds at a pre-set interest rate within a pre-set of time period
3. Saving account	c. An account that requires you to hold a certain minimum amount of money, otherwise you will be charged a monthly fee
4. CDs	d. A channel through which a customer can entrust a bank with his / her funds and make withdrawals when need be
5. Money Market Bank Account	e. An account that lets you to save on your own for retirement
6. IRA	f. Such an account offers you comfortable and secure access to your account, especially if you need some money to cater for your transactional needs on a daily basis

Part 2. Compare different types of bank accounts by making a list of their advantages and disadvantages.

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[120] The text is borrowed and modified from http://typesofbanks.org/types-of-bank-accounts/ as of 20th October, 2013.

Bank account type	Advantages	Disadvantages
Chequing account	*comfortable and secure access to your account ....*	
Saving account		
Certificates of Deposit Account		
Money Market Bank Account		
Individual Retirement Account		

Part 3. In writing, suggest who may use each of the mentioned types of accounts and why. Stress the benefits of the account type to the particular customers.

Task 3. Internet Search

Search through the Internet for information on one of the following topics:

- interesting types of banks (e.g. Islamic banks) which were not discussed at the class;
- famous bank robberies;
- cash machines around the world.

Prepare to report your findings to the class.

Task 4. Writing

Read the following situations and write a suggested e-mail.

Part 1. Call for meeting

Write an internal e-mail on behalf of Mr. George Fillis, CEO of SmartAnalysis LTD to managers of your company. Inform the managers that your company will be holding a conference "IT breakthrough in XXI century" on 15-20 January at Business Palace Compey. Call for managers to attend a special meeting dedicated to conference organization process on Friday, November 15th, at 10:00, Meeting Room #3. Ask for confirmation of their presence.

Part 2. Invitation

On behalf of your company, SmartAnalysis LTD, write an external e-mail to Mr. John Malbur, PhD. Invite him to give an opening speech at the conference "IT breakthrough in XXI century" which will be held on 15-20 January at Business Palace Compey. Specify that during the conference there will be a lot of master classes, theoretical and practical seminars and after the conference your company

plans to organize a banquet. Ask Mr. Malbur to confirm his visiting the conference if he agrees to take part.

Part 3. Acceptance of invitation

You have received an e-mail from manager of SmartAnalysis LTD with an invitation to give an opening speech at the conference "IT breakthrough in XXI century". You are going to accept the invitation and you want to ask whether the topic "Advances in speech recognition systems" will be suitable for an opening speech. Unfortunately, you cannot stay in Business Palace Compey until the 20th of January as you have to be present at your company annual meeting. You also want to inquire if you may take a guest – Mr. Ikira Tobisumi – a representative of THS company with you.

Write your answer to Mr. Daniel Carthwool, manager of SmartAnalysis LTD.

UNIT 8. MARKET AND COMPETITION

Task 1. Tiered Task

Part 1. Read the sentences and choose one appropriate word from the options. Explain the difference.

1. Economists suppose that there exist a number of market …………
    a. systems   b. structures   c. constructions
2. Price can change in response to changes in supply and ……….
    a. demand   b. request   c. need
3. In a competitive market, a buyer can choose a ……. for any product.
    a. change   b. analogue   c. substitute
4. In a monopoly only one ………. supplies the product.
    a. maker   b. producer   c. consumer
5. A government can create a monopoly over an ………. that it wants to control.
    a. competition   b. country   c. industry
6. In an ……….. there are only a few firms that make up an industry
    a. oligopoly   b. monopoly   c. perfect competition
7. Perfect competition means there are few …….. to entry for new companies.
    a. charges   b. barriers   c. fee
8. Perfect competition is characterized by many ………. and sellers.
    a. producers   b. companies   c. buyers

Part 2. Put the words in the correct order and make up sentences.

1. Competition / firm / each / homogeneous / perfect / produces / in / product.
2. Entry / the / into / are / barriers / to / market / no / there.
3. Market / no / influence / single / can / firm / the / price.
4. Large / there / of / very / firms / are / numbers / market / in / the / a.
5. Is / government / need / no / for / there / regulation.
6. Only / normal / firms / run / can / profits / in / the / make / long.

Part 3. Replace the words in bold with their synonyms.

A (1) **monopoly** exists when a specific person or (2) **enterprise** is the only (3) **supplier** of a particular (4) **commodity** (this contrasts with oligopoly which (5) **consists of** a few entities dominating an (6) **industry**. Monopolies are thus characterized by a lack of economic competition to (7) **produce** the good or service and a lack of viable substitute goods. The verb "monopolize" refers to the process by which a (8) **company** gains the ability to raise prices or (9) **exclude** competitors. In economics, a monopoly is a single (10) **seller**. In law, a monopoly

is a business entity that has (11) **significant** market power, that is, the power to (12) **charge** high prices. Although monopolies may be big (13) **businesses**, size is not a characteristic of a monopoly. A small business may still have the (14) **power** to raise prices in a small industry (or market).[121]

Task 2. Tiered Task

Read the text and do at least one part of the task after reading.

Competitive Marketing Strategy

Whatever product or service any business has to offer in the marketplace, chances are it's going to get competition. Rather than ignoring these competitors, the best way to win in competition is to take a proactive approach and develop a competitive marketing strategy. A competitive marketing strategy is one which objectively assesses the strengths and weaknesses of a product or service and compares them to that of its direct competitors. Marketing methods for the product or service are then determined accordingly, in a way that capitalizes on one company's advantages over the competition and minimizes its weaknesses.

Sizing up the competition to determine their strengths and weaknesses is something that a company can do in-house through pre-existing staff, or can outsource to a research firm along with other components of the competitive marketing strategy. Thanks to the Internet, most competitor information can be gathered online, and a summary can then be created using data from different websites. Most websites or online research firms charge for the disclosure of certain data, such as the hard numbers behind a competitor's financials, while other information, such as proprietary trade secrets may prove impossible to collect altogether.

Once the strengths and weaknesses of the competition have been collected, they should be organized into a chart alongside the company's strengths and weaknesses for easy comparison. The columns should include factors pertinent in the marketplace, such as pricing, annual sales, customer satisfaction, and functionality. The plan of action detailed in the rest of the competitive marketing strategy should then address each of

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[121] The text is borrowed and modified from http://en.wikipedia.org/wiki/Monopoly as of 20th November, 2013.

these strengths and weaknesses. For example, if a company is selling technology and has discovered in its research that the competition's technology is slower, the company will want to emphasize how fast its technology is in its advertisements and other marketing material.

In the event that research on the competition indicates that the company is weaker in most areas and possess no competitive edge, its competitive marketing strategy might entail teaming up with the competition. This could mean buying out the competition or vice versa, or it could also mean turning the competition into a client. For example, if a product is hand-made greeting cards and its biggest competition is an established, manufactured card company, one company could offer to become the other company's "custom" arm, which fills its orders for customized cards.[122]

Part 1. Mark the statements as true (T) or false (F).

1. Any product which a company offers may face competition. □
2. A competitive marketing strategy is aimed only at assessment the strengths and weaknesses of a product. □
3. Sizing up the competition can be performed by research firm only. □
4. The Internet allows a company to gather most competitor information. □
5. Most online research firms provide their service free of charge. □
6. Strength and weaknesses of a product should be organized into a chart. □
7. If company is weaker in most areas, it might team up with the competitor. □
8. "Teaming up with the competition" can mean buying your competitor. □

Part 2. Make up a plan of the text. For each paragraph, write a sentence which illustrates its main idea.

Part 3. Answer the following questions to the text:

1. What is a competitive marketing strategy?
2. How can the information about competitors be gathered?
3. In what way should strengths and weaknesses of competition be organized?
4. What should be done if the company is weaker in competition?
5. What does "teaming up with competition" mean?

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[122] The text is borrowed and modified from http://www.wisegeek.com/what-is-a-competitive-marketing-strategy.htm as of 20th October, 2013.

Task 3. Internet Search

Search through the Internet for information about competition cases between famous companies / corporations (for example, Apple vs Samsung, Coca-Cola vs Pepsi, BMW vs Audi etc). Prepare to report your findings to the class.

Task 4. Writing

The company you work at has opened a new office. You were given a task to research the current state of employees` satisfaction with the new location and office facilities. You have conducted a questionnaire of 50 employees and structured its results into a below given table. Now, you have to write a report to your CEO, Mr. John Thompson, in which you are to interpret the results and suggest your recommendations.

Subject of remark	Number of positive remarks	Number of negative remarks
Location	27	23
Staff	39	11
Equipment	15	35
Atmosphere	17	33
Technical support	36	14
Food	30	20

Part 1. *Make the report of three paragraphs using the following subheadings:*
1. Introduction
2. Results of findings
3. Conclusion and recommendations

Part 2. Make the report of four paragraphs using the following subheadings:
1. Introduction
2. Purpose
3. Results of findings
4. Conclusion and recommendations

Part 3. Make the report of five paragraphs using the following subheadings:

1. Introduction

2. Purpose

3. Methodology

4. Results of findings

    4.1. Summary of positive feedback

    4.2. Summary of negative feedback

5. Conclusions and recommendations

UNIT 9. ARITHMETIC AND NUMBER THEORY

Task 1. Tiered Task

Part 1. Insert the following words in the gaps. Translate the sentences into your native language.

division	Properties	operations	discrete
relation	Counting	applied	logarithmic

1. Arithmetic is used in day-to-day …………. , advanced science and business calculations.
2. Traditional arithmetic operations include addition, subtraction, multiplication and …………. .
3. Advanced arithmetic operations are manipulations of percentages, square roots, exponentiation, and ……………… functions.
4. Arithmetic is performed according to an order of …………. .
5. Number theorists study prime numbers as well as the ………… of objects made out of integers.
6. Real numbers may be studied in ………… to rational numbers.
7. Elementary number theory is taught in …………. mathematics courses for computer scientists.
8. Number theory may be …………. to cryptography.

Part 2. Fill in the gaps with the words from the Unit.

Arithmetic is a branch of mathematics usually (1) .... with the four **operations** (adding, subtracting, multiplication and division) of positive (2) .... Arithmetic will include **concepts** like (3) .... , identifying numbers and amounts, learning the **basic** mental math facts. It is the basic **day to day** math. Arithmetic is the (4) .... of math.

The (5) .... between arithmetic and algebra that **underscores** the use of letters is valid on an elementary level. Elementary arithmetic does not (6) .... symbols other than numerals and those of basic (7) .... and equality. Elementary algebra, a **step** ahead of arithmetic, does use letters for **formulating** and (8) .... problems and to **annunciate** properties of the arithmetic operations in a general form. However, in Higher Arithmetic, which is another **name** for (9) .... Theory, letters are used **extensively** as they are in the (10) .... of mathematics.[123]

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[123] The text is borrowed and modified from http://www.cut-the-knot.org/WhatIs/WhatIsArithmetic.shtml and http://math.about.com/od/glossaryofterms/g/The-Definition-Of-Arithmetic.htm as of 8th January 2014.

Part 3. Complete the previous part of the Task and suggest your synonyms to the words in bold.

Task 2. Tiered Task

Read the text about mathematical proofs and complete at least one part of the task.

Mathematical Proof

In mathematics, a proof is a deductive argument for a mathematical statement. Proofs are examples of deductive reasoning and are distinguished from inductive or empirical arguments; a proof must demonstrate that a statement is always true, rather than enumerate many confirmatory cases. An unproven statement that is believed true is known as a conjecture. Proofs may be viewed as aesthetic objects, admired for their mathematical beauty. There exist several methods of proofs:

Direct proof

In direct proof, the conclusion is established by logically combining the axioms, definitions, and earlier theorems. This proof uses the definition of even integers, the integer properties of closure under addition and multiplication, and distributivity.

Proof by mathematical induction

In proof by mathematical induction, a single "base case" is proved, and an "induction rule" is proved, which establishes that a certain case implies the next case. Applying the induction rule repeatedly, starting from the independently proved base case, proves many, often infinitely many, other cases. Since the base case is true, the infinity of other cases must also be true, even if all of them cannot be proved directly because of their infinite number.

Proof by contradiction

In proof by contradiction (also known as *reductio ad absurdum*, Latin for "by reduction to the absurd"), it is shown that if some statement were true, a logical contradiction occurs, hence the statement must be false.

Proof by construction

Proof by construction, or proof by example, is the construction of a concrete example with a property to show that something having that property exists. Joseph Liouville, for instance, proved the existence of transcendental numbers by constructing an explicit example. It can also be used to construct a counterexample to disprove a proposition that all elements have a certain property.

Proof by exhaustion

In proof by exhaustion, the conclusion is established by dividing it into a finite number of cases and proving each one separately. The number of cases sometimes can become very large. For example, the first proof of the four colour

theorem was a proof by exhaustion with 1,936 cases. This proof was controversial because the majority of the cases were checked by a computer program, not by hand. The shortest known proof of the four colour theorem as of 2011 still has over 600 cases.[124]

Part 1. Decide whether the following statements are true (T) or false (F). Justify your answer.

1. Proof is an inductive argument for a mathematical statement. □
2. Proof shall not enumerate many confirmatory cases. □
3. Direct proof uses logical combinations to establish a conclusion. □
4. In proof by mathematical induction only the base case is proved. □
5. In proof by contradiction, the statement is proved by
   showing that opposite statement is false. □
6. Proof by example is another name for proof by exhaustion. □
7. In proof by exhaustion the statement is divided into cases. □

Part 2. On the basis of the text, give definitions to the following terms:

Proof ....
Conjecture...
Direct proof ....
Proof by induction ....
Proof by contradiction ....
Proof by construction ....
Proof by exhaustion..

Part 3. Complete the following table. Use additional sources of information, if necessary:

Title	Methodology	Example of application
Direct proof	*The conclusion is established by logically combining the axioms, definitions, and earlier theorems*	*Proof that the sum of two even integers is always even*
Proof by induction		
Proof by contradiction		
Proof by construction		
Proof by exhaustion		

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[124] The text is borrowed and modified from http://en.wikipedia.org/wiki/Mathematical_proof as of 8th January 2014.

Task 3. Internet Search

Using sites recommended by your teacher and sites that you can find yourself, try to find information about famous mathematicians. The search should be done in pairs. Be ready to report your findings to the class.

Task 4. Writing

Having revised the material which you have learned during the lesson, complete one of the following parts of the task. In your solutions, use the linking words and words of logical sequence.

Part 1. Write a solution to the following linear equation:

$$2x - 4 = 10$$

Part 2. Write a solution to the following linear equation:

$$\frac{3}{4}x - \frac{5}{6} = 5x - \frac{125}{3}$$

Part 3. Write a solution to the following linear equation:

$$2(3x - 7) + 4(3x + 2) = 6(5x + 9) + 3$$

UNIT 10. DISCRETE MATHEMATICS

Task 1. Tiered Task

Part 1. Replace the words in bold with their synonyms.

1. Game theory is the study of mathematical **models** of conflict and cooperation between intelligent rational decision-makers.
2. An **alternative** term suggested "as a more descriptive name for the discipline" is interactive decision theory.
3. Game theory is **mainly** used in economics, political science, and psychology, as well as logic and biology.
4. Today, however, game theory applies to a wide **range** of behavioural relations.
5. Modern game theory began with the idea **regarding** the existence of mixed-strategy equilibria in two-person zero-sum games and its proof by John von Neumann.
6. His paper was followed by his 1944 book which **considered** cooperative games of several players.
7. The second edition of this book **provided** an axiomatic theory of expected utility.
8. This theory was developed **extensively** in the 1950s by many scholars.[125]

Part 2. Complete the collocations with the words in italics. Make up sentences using these collocations.

sets   science   values   integers   numbers
field   structures   mathematics   notions   theory

mathematical ……………..   graph………………………
distinct …………………   computer………………….
countable…………………..   discrete……………………
rational……………………   be enumerated by…………
related…………………….   be applied to the ………….

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[125] The text is borrowed and modified from http://en.wikipedia.org/wiki/Game_theory as of 13th January, 2014.

Part 3. Fill in the gaps with the derivatives from the words in capitals.

The term "discrete mathematics" is used in contrast with "(1) .... mathematics," which is the branch of mathematics (2) .... with objects that can vary smoothly (and which includes, for example, (3) ....). Whereas discrete objects can often be (4) .... by integers, continuous objects require real numbers.	CONTINUE DEAL CALCULATE CHARACTER
The study of how discrete objects combine with one another and the (5) .... of various outcomes is known as (6) .... Other fields of mathematics that are considered to be part of discrete mathematics include graph theory and the theory of (7) .... Topics in number theory such as congruencies and recurrence (8) .... are also considered part of discrete mathematics.	PROBABLY COMBINE COMPUTE RELATE
The study of topics in discrete mathematics usually includes such topics as the study of algorithms, their (9) .... , and (10) .... Discrete mathematics is the mathematical language of computer science, and as such, its (11) .... has increased dramatically in recent decades.[126]	IMPLEMENT EFFICIENT IMPORTANT

Task 2. Tiered Task

Read the text and do at least one part of the task after reading.

Grand challenges, past and present
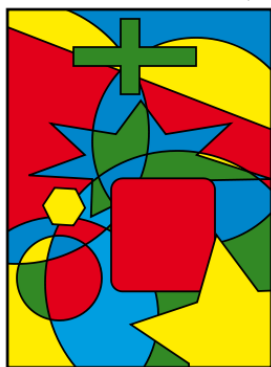
The history of discrete mathematics has involved a number of challenging problems which have focused attention within areas of the field. In graph theory, much research was motivated by attempts to prove the four colour theorem, first stated in 1852, but not proved until 1976 (by Kenneth Appel and Wolfgang Haken, using substantial computer assistance).

In logic, the second problem on David Hilbert's list of open problems presented in 1900 was to prove that the axioms

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[126] The text is borrowed and modified from http://mathworld.wolfram.com/DiscreteMathematics.html as of 13th January, 2014.

of arithmetic are consistent. Gödel's second incompleteness theorem, proved in 1931, showed that this was not possible – at least not within arithmetic itself. Hilbert's tenth problem was to determine whether a given polynomial Diophantine equation with integer coefficients has an integer solution. In 1970, Yuri Matiyasevich proved that this could not be done.

The need to break German codes in World War II led to advances in cryptography and theoretical computer science, with the first programmable digital electronic computer being developed at England's Bletchley Park. At the same time, military requirements motivated advances in operations research. The Cold War meant that cryptography remained important, with fundamental advances such as public-key cryptography being developed in the following decades. Operations research remained important as a tool in business and project management, with the critical path method being developed in the 1950s. The telecommunication industry has also motivated advances in discrete mathematics, particularly in graph theory and information theory. Formal verification of statements in logic has been necessary for software development of safety-critical systems, and advances in automated theorem proving have been driven by this need.

Computational geometry has been an important part of the computer graphics incorporated into modern video games and computer-aided design tools. Several fields of discrete mathematics, particularly theoretical computer science, graph theory, and combinatorics, are important in addressing the challenging bioinformatics problems associated with understanding the tree of life.

Currently, one of the most famous open problems in theoretical computer science is the P = NP problem, which involves the relationship between the complexity classes P and NP. The Clay Mathematics Institute has offered a $1 million USD prize for the first correct proof, along with prizes for six other mathematical problems.[127]

Part 1. Which spheres the following problems belong to?

1. Four colour theorem.
2. Hypothesis that the axioms of arithmetic are consistent.
3. Hypothesis that a given polynomial Diophantine equation with integer coefficients has an integer solution.
4. Public-key cryptography.
5. Critical path method.
6. P = NP problem.

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[127] The text is borrowed and modified from http://en.wikipedia.org/wiki/Discrete_mathematics as of 12th January, 2014.

Part 2. Match the concepts related to Discrete Mathematics history with their descriptions.

1	Four colour theorem	a	is not possible within arithmetic.
2	Proof that the axioms of arithmetic are consistent	b	is important as a tool in business and project management.
3	Advances in cryptography and theoretical computer science	c	was proved by Kenneth Appel and Wolfgang Haken, using substantial computer assistance.
4	Operations research	d	were stimulated by the need to break German codes.
5	Critical path method	e	is used in modern video games design.
6	Advances in automated theorem proving	f	is one of the most famous open problems in theoretical computer science.
7	Computational geometry	g	was developed in the 1950s.
8	P = NP problem	h	have been driven by the need to develop safety-critical systems.

Part 3. Fill in the table with the information from the text.

#	Problem	Sphere	Description	Date of proof /development
1	Four colour theorem	*graph theory*	*proved by Kenneth Appel and Wolfgang Haken, using substantial computer assistance*	*stated 1852, proved 1976*
2	Hypothesis that the axioms of arithmetic are consistent			
3	Hypothesis that a given polynomial Diophantine equation with integer coefficients has an integer solution			
4	Public-key cryptography			
5	Critical path method			
6.	P = NP problem			

Task 3. **Internet Search.**

Use the Internet to prepare a report on the new or developing topics of Discrete Mathematics. Mention scientists who worked with this topic, stages of its development, results and proofs.

Task 4. Writing.

Write an abstract to the report you have made in Task 3.
Remember that your abstract should contain the following parts:

- *Statement of the problem*
- *Findings / results*
- *Conclusions*

KEYS

UNIT 1. COMPUTER HARDWARE AND SOFTWARE

Task 3.

1 – d, 2 – a, 3 – f, 4 – g, 5 – b, 6 – c, 7 – e.

Task 4.

1 – operating system, 2 – output, 3 – processing, 4 – programs, 5 – BIOS, 6 – hardware, 7 – computer, 8 – manufacturer, 9 – chips.

Task 5.

1 – a, 2 – g, 3 – e, 4 – h, 5 – b, 6 – d, 7 – f, 8 – c.

Task 7.

Part 1. 1 – software, 2 – controls, 3 – text-based, 4 – commands, 5 – user-friendly, 6 – install, 7 – menus, 8 – applications.

Part 2. 1 – T, 2 – F, 3 – T, 4 – T, 5 – T.

Part 3. See transcript.

Task 8.

1. To start your computer, push the Power button.
2. To turn off your computer, click the Power button on the Start menu.
3. To drag a file, point to the file on the screen, press and hold the primary button, move the file to the new location.
4. In order to copy a file, right-click the file and select Copy option from the pop-up menu.
5. To delete a folder, right click the folder and select Delete from the menu.
6. To uninstall the program, click the Start button, then click Control Panel, select Programs and Components and then select the program that you want to uninstall.
7. To view a complete list of your programs, click the Start button, and then click All Programs.
8. To find a file use the Search box at the top of every folder.
9. To create a System Image, open Backup and Restore by clicking the Start button, clicking Control Panel, clicking System and Maintenance, and then clicking Backup and Restore. In the left pane, click Create a system image, and then follow the steps in the wizard.
10. To restore files, open Backup and Restore by clicking the Start button, clicking Control Panel, clicking System and Maintenance, and then clicking Backup and Restore and then click Restore my files.

Task 15.

A – Contents page, B – Title page, C – Warnings, D – Contact details, E – Troubleshooting, F – Functions, G – Index, H – Preface, I – FAQ.

Task 17.

1 – d, 2 – a, 3 – c, 4 – b.

Task 18.

Part 1. 1 – create, 2 – 'Table', 3 – columns, 4 – 'ok', 5 – document, 6 – spreadsheet, 7 workbook, 8 – cells, 9 – 'copy', 10 – 'paste'.

Part 2. 1 – c, g, a, i, b; 2 – e, h, d, j, f.

Part 3. In the first case, a table is created in a document. On the other hand, a spreadsheet is inserted in a document in the second case. A table is a list of items, organized in several columns and rows. A spreadsheet is a tool, where the cells can interact and which can contain formulae causing the displayed value to change because of a change in some other cell.

Task 19.

Part 1. See Parts 2-3.

Part 2. 1 – Includes unnecessary information; 2 – Use of Passive Voice is not appropriate; 3 – Informal style; 4 – The order of actions is not obvious.

Part 3.

5 – Incorrect order of actions; 6 – Inappropriate use of Passive Voice; 7 – Paragraph is too long; 8 – Use of professionalisms.

Correct variant:

1. Load the appropriate paper
2. Open the file that you want to print.
3. Click File, and then click Print.
4. Click Properties, then click Setup to get into Feature tab.
5. Select the Feature tab, then click Select the media size from Size drop-down list.
6. Select Borderless check box.
7. If you are printing photos, select Best from the Print Quality list. Alternatively, select Maximum dpi, which provides up to 4800 x 1200 optimized dpi for optimum print quality.
   Note: This setting might temporarily use a large amount of hard disc space (400 MB or more) and will print more slowly. To avoid this, you may change other print settings (for more information, see Settings).
8. Start printing.

Task 21.

A. 1 – Click, 2 – Select, 3 – Click.

B. 1 – Shut, 2 – Unplug, 3 – Open.

Task 22.

The manual explains how to clean Java cash and is developed for Java software. The Java Control Panel can be accessed from Windows Control Panel.

WORKBOOK

Task 1.

Part 1. 1 – stored, 2 – flash memory, 3 – upload, 4 – word-processing program, 5 – photo-editing program, 6 – unit, 7 – LCD screens, 8 – pixels.

Part 2. 1 – runs, 2 – perform, 3 – input, 4 – output, 5 – files, 6 – peripheral, 7 – interact, 8 – commands, 9 –graphical user interfaces, 10 – screen.

Part 3. Open task.

Task 2.

Part 1. 1 – T, 2 – T, 3 – F, 4 – F, 5 – T, 6 – T.

Part 2.

Linux OS

Advantages: one of the most secure systems, free of charge, provides exceptional performance even on a small hard disk.

Disadvantages: complex OS, lack of multimedia support, small amount of users.

Mac OS

Advantages: requires low level of maintenance, fewer occurrences of computer viruses.

Disadvantages: low compatibility with hardware and software.

Windows

Advantages: highly compatible, feature-rich, wide selection of software, widespread usage.

Disadvantages: expensive, vulnerable, most targeted system.

Part 3. Open task.

UNIT 2. PROGRAMMING

Task 2.

1 – D, 2 – B, 3 – B, 4 – C, 5 – A, 5 – B.

Task 3.

1 – b, 2 – e, 3 – a, 4 – g, 5 – c, 6 – f, 7 – d.

Task 4.

Programming – coding (syn.), step– stage (syn.), turn on – turn off (ant.), perform – execute (syn.), language – code (syn.), add – subtract (ant.), part – whole (ant.), primitive – complicated (ant.), high-level – low-level (ant.), general – specific (ant.), convert – change (syn.), break down – divide (syn.), instruction – command (syn.)

Task 5.

1 – c, 2 – f, 3 – a, 4 –h, 5 – g, 6- d, 7 – b, 8 – e.

Task 7.

Part 1. 1 – code, 2 – hardware, 3 – specialized, 4 – scientists, 5 – businessmen, 6 – algebra, 7 – class, 8 – concept, 9 – relationship, 10 – object-oriented programming.

Part 2. 1 – F, 2 – T, 3 – F, 4 – T, 5 – T, 6 – F, 7 – F, 8 – T.

Part 3. Open task.

Task 18.

Part 1. 1 – executing, 2 – 3-8, 3 – expected, 4 – defects, 5 – failed, 6 – troubleshooting, 7 – steps, 8 – bug, 9 – repeat, 10 – system.

Part 2.

1. Whoever is executing test case.

2. 3-8 steps.

3. Specifying the expected result

4. Indicating the failed step.

5. Breaking it up into smaller sets.

6. Only when they are needed.

Part 3. Open task.

Task 19.

Part 1. 1 – Test case ID, 2 – Author, 3 – Windows Vista, 4 – file, 5 – Type, 6 – Bold, 7 – Expected, 8 – Actual.

Part 2. 1 – Change PIN, 2 – any number except '5555', 3 – Main menu, 4 – Click the 'Change PIN' button, 5 – Re-enter '5555', 6 – The system displays a message of successful operation.

Part 3. Suggested answer:

Case 1111: Ensure that application behaves correctly if printer is not available. Steps:1. Verify that no printer is connected with machine. 2. Open the application and click on Print. 3. Verify that proper message appears for printer unavailability.

WORKBOOK

Task 1.

Part 1. 1 – machine language, 2 – develop, 3 – subtract, 4 – perform, 5 – high-level language, 6 – interact, 7 – convert, 8 – compare.

Part 2. Suggested answers:

1 – steps, 2 – large, enormous, 3 – first, 4 – operates, 5 – executes, 6 – commands, 7 – errors, 8 – dividing.

Part 3. 1 – applications, 2 – understandable, 3 – compiler, 4 – instructions, 5 – operations, 6 – programming, 7 – popularity, 8 – complexity.

Task 2.

Part 1. 1– C, 2. – C, 3. – C++, 4 – Pascal, 5. – C++, 6. – C++, 7. – C++, 8. – Java.

Part 2.

#	Programming language	Sphere of Use	Advantages	Disadvantages
1	C ++	Large projects	Reusability Object-oriented structure	Less efficient than C
2	C	Game programming	Makes programs faster and smaller	Cannot be reused
3	Pascal	Teaching language	Easy to understand	Is mostly used only for teaching
4	Fortran	Science	Computes values of any size to high precision	Not flexible Hard to read and write
5	Java	Networking	Quite easy Reusability	Lower efficacy Slow interface

Part 3. Suggested answers:

PHP is a common language for webpage design that is sometimes used as a scripting language. PHP is designed for rapid website development, and as a result contains features that make it easy to link to databases, generate HTTP headers, and so forth. As a scripting language, it contains a relatively simple set of basic components that allow the programmer to quickly get up to speed, though it does have more sophisticated object-oriented features.

LISP is functional language used mostly in computer science research. LISP is unusual in that it stores (nearly) all data in lists, which are like arrays, but without index numbers. The syntax for lists is very simple, making it easy for programmers to implement complex structures.

Task 21.

a – 3, b – 6, c – 8, d – 2, e – 5, f – 4, g – 1, h – 7.

UNIT 3. EXPERT SYSTEM

Task 3. 1 – c, 2 – a, 3 – b, 4 – g, 5 – d, 6 – e, 7 – f.

Task 4. 1 – applications, 2 – equipment, 3 – information, 4 – reasoning, 5 – maintenance, 6 – explanation, 7 – users, 8 – thought, 9 – settings, 10 – manufacturing.

Task 5.

1. The first electro-mechanical computer was developed in 1939 by Konrad Zuse.
2. Over 6, 000 new computer viruses are released every month.
3. The first computer mouse was constructed in 1964 by Dough Engelbart.
4. Over 1 million domain names are registered every month.
5. The first hard drive which could hold 5 MB of data was created in 1979.
6. 200 million transistors are used in an average video card.
7. Music in the style of the composers of the past can be composed by artificial intelligence system.
8. First web browser Mosaic was released in 1993.
9. Alan Turing is considered to be the father of AI.
10. More than 2 billion computers will be used in 2015.

Task 7.

Part 1. 1 – expert system, 2 – input, 3 – performs, 4 – analysis, 5 – context, 6 – conceptual map, 7 – applications, 8 – platforms, 9 – effective, 10 – unstructured.

Part 2. 1. COGITO is expert system semantic intelligence platform.

2. Semantic analysis enables system to understand the meaning of words based on their context.

3. Conceptual map is, basically, a structured representation of the content.

4. The first feature of COGITO semantic technology is the understanding of the relationships between the different concepts within a sentence.

5. The second important feature of COGITO is its capability to perform full disambiguation.

Part 3. See transcripts.

Task 15. a – 7, b – 5, c – 1, d – 11, e – 2, f – 10, g – 4, h – 6, i – 12, j – 9, k – 13, l – 4, m -8.

Task 17.

Responsible for	working with clients, analysis, testing, quality assurance, networking, data analysis, testing, debugging, audits, disaster recovery, problem resolution, design analysis, updating technical documentation
Assist	disaster recovery, problem resolution, design analysis
Create and maintain	data warehouse, user account profiles and passwords
Conduct	cost analysis, data analysis, design analysis
Test	data verification methods
Resolve	complex problems
Play key role in	working with clients, cost analysis, testing, quality assurance, networking, problem resolution
Participate in	cost analysis problem resolution design analysis, updating technical documentation
Perform	design analysis data analysis, debugging, audits, cost analysis, testing,
Prepare	detailed program specifications

Task 18.

Part 1. 1 – profile, 2 – descriptive, 3 – attention, 4 – providing, 5 – employment, 6 – job titles, 7 – detail, 8 – responsibilities, 9 – stage, 10 – education, 11 – experience, 12 – qualifications, 13 – objective, 14 – contact details, 15 – interview.

Part 2.
1. Profile statement should be brief and interesting.
2. Going into detail with full job description
3. Most of their experience comes from time in education
4. Show how you have used any training you received in a real working environment
5. Less than three.

Part 3. Open task.

Task 21.

1 – Personal information, 2 – Name, 3 – Date of birth, 4 – Nationality, 5 – Address, 6 – Education, 7 – Establishment, 8 – Degree, 9 – Working Experience, 10 – Other skills, 11 – Interests.

WORKBOOK

Task 1.

Part 1. 1– simulate, 2 – reasons, 3 – expressed, 4 – adapted, 5 – based, 6 – translate, 7 – provides.

Part 2.

1 – intelligence, 2 – developed, 3 – analyse, 4 – applications, 5 – components, 6 – engine, 7 – facts, 8 – interprets, 9 – classification.

Task 3.

Part 1. 1 – B, 2 – A, 3 – C, 4 – A, 5 – B.

Part 2.

Name	**ELIZA**	**Cleverbot**
Date of creation	1966	1997
Developer	Joseph Weizenbaum	Rollo Carpenter
Turing test performance	Seemed to be able to fool users into believing that they were conversing with a real human	Out of the 334 votes cast, Cleverbot was judged to be 59.3 % human
Key method of operation	recognition of cue words or phrases in the input, and giving the output of corresponding pre-programmed responses that can move the conversation forward in a meaningful way	After searching through its saved conversations, it responds to the input by finding how a human responded to that input when it was asked

Part 3. Open task.

MODULE TEST 1 KEYS.

1. – a. 2. – d. 3. – c. 4. – c. 5. – a. 6. – d. 7. – a. 8. – a. 9. – d. 10. – a. 11. – c. 12. – a. 13. – b. 14. – b. 15. – c. 16. – b. 17. – a. 18. – c. 19. – b 20. – b. 21. – c. 22. – d. 23. – b. 24. – a. 25. – a.

UNIT 4. COMPUTER NETWORKS

Task 2. 1 – F, 2 – T, 3 – F, 4 – F, 5 – T, 6 – F, 7 - T.
Task 3. 1 – c, 2 – e, 3 – a, 4 – g, 5 – d, 6 – b, 7 – f.
Task 4. 1 – b, 2 – d, 3 – a, 4 – c, 5 – a,6 – d, 7 – b, 8 – c, 9 – c, 10 – d.

Task 5.

1. Pablo Picasso said that computers were useless. They could only gave us answers.
2. Bill Gates said that it was fair to say that personal computers had become most empowering tool we had ever created. They were (are) tools of communication, they were (are) tools of creativity, and they could (can) be shaped by their user.
3. Isaac Asimov said that he did not fear computers. He feared the lack of them.
4. Richard Dawkins said that he rather looked forward to a computer program winning the world chess championship. He thought that humanity needed a lesson in humility.
5. Sydney J. Harris said that the real danger was not that computers would begin to think like men, but that men would begin to think like computers.
6. Tim O'Reilly said that we were (are) entering a new world in which data may be more important than software.
7. Kent Conrad said that access to computers and the Internet had become a basic need for education in our society.
8. Ray Kurzweil said that supercomputers would achieve one human brain capacity by 2010, and personal computers would do so by about 2020.
9. W. Daniel Hillis said that people were mostly focused on defending the computers on the Internet, and there had been surprisingly little attention to defending the Internet itself as a communications medium.
10. Hod Lipson said that we had seen computers play chess and beat grand masters. We had seen computers drive a car across a desert. But interestingly, playing chess was easy, but having a conversation about nothing was really difficult for a computer.

Task 7.

   Part 1. 1 – T, 2 – T, 3 – F, 4 – F, 5 – T, 6 – T.
   Part 2. 1 – router, 2 – network, 3 – number, 4 – applications, 5 – transmitted, 6 – scheme, 7 – addressing, 8 - TCP/IP protocol, 9 – various, 10 – wireless, 11 – Ethernet, 12 – use, 13 – radio waves, 14 – provided, 15 – cable.

Part 3.

1. Router – a device that you must have in order to establish a network.

2. Network – a number of computers that are connected together to share information or work on common applications or projects.

3. Addressing – a scheme used o transmit and address data between the computers.

4. Wired router – a router that transmits data using an Ethernet cable.

5. Wireless router – a router that transmits data using either a cable or radio waves.

Task 8. Suggested answers:

The customer explained that he was trying to set up a home network and asked if there was a way to do it without stinging Ethernet cable. The consultant assured him that it was possible and suggested to consider setting up wireless network.

The customer asked what hardware was required to build a wireless network. The consultant explained that no hardware other than wireless adapters was required to build a small wireless LAN.

The customer inquired how many computers could share one Wi-Fi network. The consultant said that the exact number of devices varied but was probably larger than customer thought.

The customer asked if two routers could be used on the same home network. The consultant answered that installing two routers on the same home network could be useful when building a hybrid wired and wireless network.

The customer inquired how Wi-Fi use affected computer battery life. The consultant explained that using Wi-Fi on a computer or handheld device could significantly increase its power consumption.

Task 10.

a) group, connected, network, speed, include, distance, several, access, web.

b) A computer network is a group of computers connected to each other electronically.

A local area network (often called a LAN) connects two or more computers, and may be called a corporate network in an office or business setting.

An "internetwork", sometimes called a Wide Area Network (because of the wide distance/range between networks) connects two or more smaller networks together. The largest internetwork is called the Internet.

Task 17. 1 – b, 2 – e, 3 – a, 4 – c, 5 – f, 6 – d.

Task 18.

Part 1. Apply for the position, gain experience in, enclose a copy of a CV, look forward to meeting, be available for the interview, have the opportunity, study full time, work for three years.

Part 2.

1 – post of, 2 – I am eager, 3 – specialise in, 4 – experience in, 5 – I currently work, 6 – I have been responsible, 7 – be contacted, 8 – to hearing.

Part 3. Suggested answer:

Dear Hiring Manager,

I am interested in the advertisement for the position of website designer which I read on Craigslist.com. Although I don't have experience related to the work with companies specializing in T-shirt production, I am eager to try myself in web design. I am interested in site development and design and I already have some ideas about your site.

I am looking forward to hearing from you.

Yours faithfully,

Lillian Black.

Task 19.

Paragraph 1 – 1, 4, 8.

Paragraph 2 – 2, 5, 7, 10, 12, 14, 16, 18.

Paragraph 3 – 13, 17, 19, 21, 23.

Paragraph 4 – 3, 6, 9, 11, 15, 20, 22, 24.

Task 14.

1 – interest, 2 – opportunity, 3 – experience, 4 – candidate, 5 – include, 6 – applications, 7 – things, 8 – service, 9 – understanding, 10 – development, 11 – analysis, 12 – testing, 13 – documentation, 14 – reached, 15 – speaking.

WORKBOOK

Task 1.

Part 1. 1 – c, 2 – b, 3 –b, 4 – a, 5 – c, 6- a, 7 –b, 8 – c.

Part 2.

1. Computer networks allow computers to exchange data.

2. Nodes can include hosts and networking hardware.

3. Computer networks facilitate interpersonal communication.

4. Authorized users may access information stored on other computers.

5. Computer network may be used by hackers to deploy computer viruses.

6. Complex computer network may be difficult to set up.

Part 3. 1 – collections, 2 – users, 3 – connects, 4 – cabling, 5 – manage, 6 – share, 7 – send, 8 – fall into, 9 – server, 10 – applications, 11 – allows, 12 – require, 13– Local, 14 – Wide, 15 – phone lines.

Task 2.

Part 1. 1 – F, 2 – T, 3 – F, 4 – F, 5 – T, 6 – T, 7 – F, 8 –T.

Part 2. Open task.

Part 3. Open task.

UNIT 5. THE INTERNET

Task 3.

     1 – c, 2 – f, 3 – g, 4 – b, 5 – a, 6 – d,7 – e.

Task 4.

     1 – revolutionized, 2 – networks, 3 – interconnect, 4 – emerged, 5 – public, 6 – capability, 7 – purpose, 8 – accessible, 9 – connects, 10 – chat, 11 – transmission, 12 – digital, 13 – applications, 14 – sales, 15 – transform.

Task 5. Suggested answers:

     What is the Internet? How many countries are linked into data exchanges? How many Internet users were estimated to be in 2011? What part of world`s population does it represent? Is there only one way to access the Internet? Most online services offer access to the Internet, don't they? How else is it possible to access the Internet?

Task 6.

     Part 1. 1 – in my humble opinion, 2 – by the way, 3 – laugh out loud, 4 – you got tobe kidding.

     Part 2. 1 – e-mail, 2- arrived, 3 – share, 4 – changed, 5 – typing, 6 – fashion, 7 – download, 8 – toolbar, 9 – firewall, 10 – wallpaper, 11- shorter, 12 – writing, 13 – abbreviation, 14 – spoken.

     Part 3. Open task.

Task 16.

     1 – D, 2 – A, 3 – F, 4 – B, 5 – G, 6 – C, 7 – E.

Task 17.

     1 – To, 2 – From, 3 – Date, 4 – Subject, 5 – clients, 6 – I think, 7 – employees, 8 – I would like, 9 – please.

Task 18.

     Part 1. 1 – company or institution, 2 – partner or employee, 3 – intended purpose, 4 – intended audience, 5 – business letter, 6 – short, 7 – quickly and clearly.

     Part 2. Memo is not a business letter, nor does it follow the format of a letter. Rather, it needs to be written in short, succinct sentences so that the points you need to make are made quickly and clearly. As a memo is not a letter, salutary remarks are not needed.

     Part 3. Open task.

Task 19.

     Part 1. 1 – Date, 2 – Subject, 3 – stored, 4 – server, 5 – Since, 6 – use, 7 – easier, 8 – reference, 9 – note, 10 – home, 11 – accessed, 12 – contact.

Part 2. 1 – To, 2 – From, 3 – Date, 4 – Subject, 5 – information, 6 – essential, 7 – recommending, 8 – take, 9 – departments, 10 – measures, 11 – ensure, 12 – within.

Part 3. 1 – provides, 2 – be programmed, 3 – V, 4 – where, 5 – was, 6 – send, 7 – on the part, 8 – who, 9 – V, 10 – company's, 11 – V, 12 – let's.

Task 21.

1 – C, 2 – A, 3 – E, 4 – B, 5 – D.

WORKBOOK

Task 1.

Part 1. 1 – system, 2 – protocol, 3 – resources, 4 – blogging, 5 – hyperlinks, 6 – engines, 7 – browser, 8 – services.

Part 2. 1- information, 2 – model, 3 – protocol, 4 – communicate, 5 – communicate, 6 - browsers, 7 - hyperlinks, 8 – ways, 9 – messaging, 10 – synonymous.

Part 3. 1 – development, 2 – organization, 3 – standardized, 4 – browser, 5 – creation, 6 – graphical, 7 – manipulations, 8 – dominant, 9 – users.

Task 2.

Part 1. 1 – google.com, 2 – youtube.com, 3 – facebook.com, 4 – yahoo.com, 5 – amazon.com, 6 – wikipedia.org, 7 – ebay.com, 8 – twitter.com, 9 – bing.com, 10 – msn.com.

Part 2. Search: google.com, yahoo.com, bing.com

Social Networking: facebook.com

Video-Sharing: youtube.com

Reference: wikipedia.org

Commerce: amazon.com, ebay.com, msn.com

Part 3. Open task.

MODULE TEST 2 KEYS.

1. – a. 2. – c. 3. – c. 4. – a. 5. – b. 6. – d. 7. – d. 8. – b. 9. – a. 10. – c. 11. – a. 12. – a. 13. – b. 14. – c. 15. – d. 16. – c. 17. – a. 18. – c. 19. – b 20. – c. 21. – a. 22. – a. 23. – c. 24. – c. 25. – b.

UNIT 6. BUSINESS AND ENTERPRISE

Task 2.

1 – T, 2 – F, 3 – F, 4 – T, 5 – F

Task 3.

1 – d, 2 – g, 3 – a, 4 – f, 5 – c, 6 – e, 7 –b, 8 – i, 9 – h.

Task 4.

1 – c, 2 – b, 3 – d, 4 – a, 5 – b, 6 – d, 7 – a, 8 –c, 9 – b, 10 – c.

Task 5.

A. 1 – putting, 2 –to make, 3 – building, 4 – transforming, 5 – setting up, 6 – to bring.

B. 1 – to reflect, 2 – creating, 3 – deciding, 4 – to appear.

C. 1 – launching, 2 – to change, 3 – returning, 4 – drinking, 5 – to expand.

Task 7.

Part 1. 1 – T, 2 – T, 3 – F, 4 – F, 5 – T.

Part 2.

1 – Reorganization, 2 – software, 3 – designed, 4 – Chief Executive, 5 – services, 6 – providing, 7 – consumers, 8 – devices, 9 – tablets, 10 – management, 11– compete, 12 – responsibilities, 13 – executives, 14 – employee.

Task 15.

1 – Writer's address, 2 – Date, 3 – Reader's address, 4 – Salutation, 5 – Text, 6 – Complimentary close, 7 – Signature, 8 – Typed name.

Task 16.

1– F, 2 – A, 3 – E, 4 – D, 5 – B, 6 – C.

Task 17.

Informational letter: 7, 1, 12.

Letter of request: 3, 6, 11.

Letter of complaint: 4, 10, 2.

Letter of apology: 8, 5, 9.

Task 19.

Introduction: I am writing to request…, I received your June 16th letter requesting…, The purpose of this letter is to …., This is in response to your request…

Body: Moreover, …., First, …., Additionally, …., Consequently, As you may know.

Conclusion: Looking forward to hearing from you, If you have any questions, feel free to contact me at …, We appreciate your cooperation in this matter, Let me know if you have any further questions…, In closing, I believe that…, Thank you for your prompt attention on this matter.

Task 20.

    Part 1.

    1 – e, 2 – c, 3 – d, 4 – f, 5 – b, 6 – a.

    Part 2. Suggested answers:

    1. Dear Mr. Kent

    2. As stated, the logo should be reproduced in colour

    3. The logos on the t-shirts you sent are in black, which is unacceptable.

    4. Please make the necessary corrections and

    5. Thank you for your prompt attention on this matter.

    6. Bye.

    Part 3. Suggested answer

Dear Mr. Moriarity,

    The purpose of this letter is to formally invite you, on behalf of the Board of Directors, to be the Closing Keynote Speaker at the upcoming 2015 IDCRI Conference.

    The theme of this conference is "Latest Breakthrough in IT". It will be held at the Mountainview Conference Facility, in Montpelier, Vermont from December 3 to 5, 2006.

    For you information, Susan Crutchlow from Business & IT will be the opening Keynote Speaker. The provisional title of her presentation is "The Perspective of IT in Business Sphere". We will forward a complete draft speaker program to you in a couple of weeks to give you an idea of the specific subjects that will be covered by the other speakers.

    We expect attendance this year to be the highest ever; in the area of 2,000 delegates and 150 speakers. This includes a large contingent from our new European Chapter that is based in Geneva.

    In closing, we would be pleased and honoured if you would consent to be our closing speaker at the 2006 ICDRI Conference. I will call you in a week or so to follow up on this.

Yours sincerely,

Richard Bagnall,

Executive Director,

International Disabled Children Research Institute.

Task 22.

    1. I am writing this letter to convey my apologies for the inconvenience.

    2. I was not in the office and have just returned from a week long holiday.

    3. I have reviewed your request and will be sending the person to fix your air conditioner by today evening.

    4. You need not pay any charges for the service that we provide today.

5. You have been a valuable customer for us.

6. Once again, I am sorry for the trouble.

7. I am always there to serve you.

8. Yours sincerely.

WORKBOOK

Task 1.

Part 1. 1– f, 2 – d, 3– a, 4 – c, 5 – f, 6 – b.

Part 2.

1 – company, 2 – ownership, 3 – corporation, 4 – supplier, 5 – profit, 6 – business, 7 – shareholder, 8 – retailer, 9 – goods, 10 – director, 11 – proprietor.

Part 3.

1 – multinational, 2 – company, 3 – subsidiary, 4 – networks, 5 – employs, 6 – CEO, 7 – manufacturer, 8 – consumer, 9 – line, 10 – vendor.

Task 2.

Part 1. Suggested answer:

1. Advances in IT have changed business.

2. Analysing startup costs.

3. Maintenance expenses.

4. Business automation helps to save time.

5. Automation leads to job losses.

6. Facilities of electronic databases.

7. Security vulnerability.

Part 2. Suggested answers:

Advantages: quick correspondence, minimizing business travel through telecommunication, immediate process of paperwork, automated calculation of transactions, convenient storage means.

Disadvantages: high startup costs, need to purchase user licenses, costs for training employees to use technology, expensive maintenance, elimination of jobs, alienation of clients, vulnerability to security breaches.

Part 3. Open task.

UNIT 7. BANKING

Task 3.

1 – c, 2 – e, 3 – b, 4 – h, 5 – a, 6 – g, 7 – d, 8 – f.

Task 4.

1 – account, 2 – deposit, 3 – cash, 4 – cheque, 5 – debit, 6 –payment, 7 – debit card, 8 – credit, 9 – transactions, 10 – balance, 11 – account statement.

Task 5.

1. Meeting was cancelled due to poor weather conditions.

2. Banks were closed on Monday because of public holiday.

3. Access was denied since the password was wrong.

4. Bank changed interest rate in order to raise money from deposits.

5. As the company had low profit, its share price fell.

6. Banks lend money in order to earn profit.

7. Bank account was closed due to continually going in overdraft.

8. The reason to withdraw money is the end of deposit period.

Task 6.

Part 1. Mentioned ideas: 1, 3, 6, 8, 9, 13.

Part 2. 1 – convenient, 2 – balance, 3 – funds, 4 – stocks, 5 – risk, 6 – financial institution, 7 – manually, 8 – secure, 9 – site, 10 – https, 11 – passwords, 12 – accounts, 13 – public, 14 – transactions, 15 – log out.

Part 3. Open task.

Task 15.

1 – G, 2 – F, 3 – A, 4 – D, 5 – B, 6 – E, 7 – C.

Task 17.

1 – b, 2 – b, 3 – a.

Task 19.

Good writing: Electronic thank-you notes;

Clear and appropriate content of e-mail;

Clear and meaningful subject line like "Application for system analyst position";

Writing "Dear Sir or Madam" if the name isn't supplied;

Writing "Ms" if the marital status is unknown;

Starting by saying why you`re writing;

Including your job title in signature block;

Giving full name and full contact information, including mailing address and phone number in signature block.

Bad writing: Sending e-mail randomly to someone in the company saying "I'm not sure if you are the right person, but I figured you could forward this…";

Using alias and extension like "gamenerd777@whatever.net";

Blank subject line;

Writing first and last names in greeting line ("Dear Mr. Jack Tomphson");

Starting by introducing yourself and small talk questions;

Using stylized fonts;

Using all capitals;

Sending a content-empty e-mail with attachment;

Naming attachments by numbers (lttr2343).

Task 22.

1 – To, 2 – Thank you for buying Agel, 3 – Dear Mr. Clement, 4 – We value your business and will do our best to respond fast to your business needs, 5 – Sincerely, 6 – Client Services Manager.

WORKBOOK

Task 1.

Part 1.

O	V	E	R	D	R	A	F	T				
			E	E				T	U			
			V	P		T	R	A	D	E	U	
			E	O		B	A	N	K			U
T	R	A	N	S	A	C	T	I	O	N		D
			U	I		U		N	M			E
		F	E	T		R	E	T	A	I	L	R
	L	I	M	I	T	R		E	R		E	W
B	O	N	D			E		R	G		N	R
		A	E			N		E	I		D	I
		N	B			C		S	N			T
		C	I			Y		T				E
F	E	E	T			C	R	E	D	I	T	

Part 2.

1 – borrow, 2 – account, 3 – credit, 4 – interest, 5 – mortgage, 6 – underwriting, 7 – fell, 8 – currencies, 9 – loans, 10 – transactions.

Part 3.

1 – banking, 2 – media, 3 –access, 4 – allowed, 5 – statements, 6 – transfer, 7 – bill, 8 – grow, 9 – connections, 10 – offer, 11 – browser, 12 – customers, 13 – interest, 14 – advantage.

Task 2.

Part 1. 1 – d, 2 – f, 3 – a, 4 – b, 5 – c, 6 – e.

Task 3.

Chequing account

Advantages: offers you comfortable and secure access to your account, lacks monthly service fees.

Saving account

Advantages: allows the account holder to amass interest on the funds deposited for future use;

Disadvantages: holders of savings account are limited to the amount of deposits and withdrawals they can make on monthly basis; holders are not allowed to access their funds with cheques.

Certificates of Deposit Account

Advantages: have relatively higher interest rates compared to the traditional savings account.

Disadvantages: holders are not able to access their money any time.

Money Market Bank Account

Advantages: interest is normally higher than that imposed on checking and savings accounts.

Disadvantages: you have to hold a certain minimum amount of money, otherwise you will be charged a monthly fee.

Individual Retirement Account

Advantages: lets you to save on your own for retirement.

Disadvantages: no tax-free cash withdrawals.

Part 3. Open task.

UNIT 8. MARKET AND COMPETITION

Task 3.

1 – g, 2 – c, 3 – a, 4 – h, 5 – b, 6 – e, 7 – d, 8 – f.

Task 4.

1 – structure, 2 – industry, 3 – monopoly, 4 – supplies, 5 – price, 6 – consumers, 7 – marketplace, 8 – demand, 9 – substitute, 10 – quality, 11 – competition, 12 – profit.

Task 5.

1. The prices may change in the nearest month.

2. The CEO must have gone on business trip.

3. Employees must follow safety rules at the workplace.

4. The company should develop another competitive product line.

5. The bank can raise interest rate without customer notification.

6. The guests should arrive at the conference at 9:00 AM.

7. He cannot make it at the opening time.

8. Companies should / have to meet the customers` expectations.

9. We may enter the foreign market the next year.

Task 6.

Part 1. 1 – F, 2 – T, 3 – T, 4 – T, 5 – F, 6 – T, 7 – F, 8 – F.

Part 2.

1 – demand, 2 – market, 3 –business, 4 – competition, 5 – producers, 6 –affect, 7 –decisions, 8 – react, 9 – amount, 10 – product, 11 –entry, 12 – price.

Part 3.

1.Price, revenue, demand.

2.A large number of producers means there is so many competitors that each one is too small to affect the market.

3.A market power is defined as the ability to control the price.

4.A large number of producers, homogeneous product, free entry and exit.

5.The demand for a highly priced product will fall.

Task 7.

Part 1. Open task.

Part 2. Suggested answers:

Make your own unique product and follow your strategy.

Analyse competitor`s weaknesses and strengths.

Respond to customers' needs.

Keep focus on how to serve the customers more efficiently.

Emphasize on innovations into business.

Try to find a niche market and serve that niche to the best of your effort.

Part 3. Suggested answers:

Several things are evident from this chart:

- Each curve – supply and demand – indicates the quantity supplied or demanded at the prices offered. At a price of $4.00, for example, buyers would be willing buy about 85 units. However, at that price, only about 10 would be supplied.

- Where the two curves intersect, the equilibrium, or market, price is found. The quantity supplied at that price is the same as the quantity demanded at that price – about $7.50 in this chart.

- When the market price changes – because of a change in supply – the demand curve is not directly affected. If the price decreases, there will be an increase in quantity demanded but not a change in overall demand.

- Supply and demand curves often have a curved – as opposed to straight line – shape since there is no reason why the same change in price – say, $1.00 – will have the same impact at high or low prices. For example, if the price of heavy cream were reduced from $3.00 to $2.00 a pint, quantity demanded would increase. However, if heavy cream sells for an already low price of $1.00 per pint, reducing the price even further would have little effect. This product simply contains too many calories for consumers to consume more even if it were free.

Task 15.

1 – D, 2 – A, 3 – F, 4 – B, 5 – E, 6 – C.

Task 16.

1 – E, 2 – A, 3 – C, 4 – B, 5 – D.

Task 17.

Aim of investigation: the aim of … is to …, will outline, was to determine …, the purpose of … is to …, to investigate.

Who requested the report: was requested by, as requested by, was instructed, was asked, make appropriate recommendations, …was asked to submit …

When the report was requested: by (date), on (date), before (date).

Methodology used: was collected, with discussions, was used, obtain, carry out (a research, a task etc.), was undertaken, were surveyed, responses were identified, questionnaires.

Recommendations: should be done, should be undertaken, it is recommended that…, make the following recommendations…

Task 18.

Part 1. Suggested answer:

1. Introduction

1.1. Background

1.2. Aim

1.3. Scope

2. Historical Background

2.1 History of Internet Use in School

2.2. Current State of Internet Implementation

3. Methodology

4. Content

4.1. Learning Objectives

4.2. Learning Activities

4.2.1. Listening

4.2.2. Speaking

5. Pedagogical Approach

6. Conclusions

7. Recommendations

Part 2.

1– moreover, 2 – however, 3 – therefore, 4 – namely, 5 – although, 6 – as the result, 7 – although, 8 – as, 9 – due to, 10 – however.

Part 3.

1. What is the title of a report? Who is the author of a report?

2. What is the context and scope of the report? What are the objectives of a report?

3. What form did your enquiry take ? Did you carry out interviews or questionnaires, how did you collect your data ? What measurements did you make ?

4. What is the result of the research? What are the advantages and disadvantages of an issue in questions?

5. What have you concluded as a result of the research?

6. What recommendations may be made to improve the issue?

Task 19.

Good writing: separation of parts of the report so that they stand out clearly; use of subheadings; use of dot points/ numbers/ letters to articulate these elements; use of tables and figures (graphs, illustrations, maps etc) for clarification; a neat header and/or footer; use of consistent and appropriate formatting; use of clear and correct information; formal language.

Bad writing: the inclusion of careless, inaccurate, or conflicting information; the inclusion of outdated or irrelevant data; facts and opinions that are not separated;use of informal style of writing; use of stylized fonts; unsupported conclusions and recommendations; careless presentation and proof-reading; too much emphasis on appearance and not enough attention to solid content.

Task 21.

1 – F, 2 – D, 3 – E, 4 – B, 5 – H, 6 – A, 7 – G, 8 – C.

WORKBOOK

Task 1.

Part 1.

1 – b, 2 – a, 3 – c, 4 – b, 5 – c, 6 – a, 7 – b, 8 – c.

Part 2.

1. In perfect competition each firm produces homogeneous product.

2. There are no barriers to entry into the market.

3. No single firm can influence the market price.

4. There are a very large numbers of firms in the market.

5. There is no need for government regulation.

6. Firms can only make normal profits in the long run.

Part 3. Suggested answers:

1 – occurs, 2 – firm, company, 3 – producer, 4 – good, 5 – is made up, 6 – business, 7 – make, provide. Deliver, 8 – firm, 9 – eliminate, 10 – merchant, trader, 11 – large, 12 – set, 13 – industries, 14 – influence.

Task 2.

Part 1.

1 – T, 2 – F, 3 – F, 4 – T, 5 – F, 6 – T, 7 – T, 8 – T.

Part 2. Suggested answers:

1. Develop a competitive marketing strategy.

2. Size up the competition.

3. Organize strengths and weaknesses in a chart.

4. Teaming up the competition.

Part 3.

1. A competitive marketing strategy is one which objectively assesses the strengths and weaknesses of a product or service and compares them to that of its direct competitors.

2. A company can gather information about competitors either in-house through pre-existing staff, or can outsource to a research firm along with other components of the competitive marketing strategy.

3. Strengths and weaknesses should be organized into a chart alongside the company's strengths and weaknesses for easy comparison.

4. In the event that research on the competition indicates that the company is weaker in most areas and possess no competitive edge, its competitive marketing strategy might entail teaming up with the competition.

5. Teaming up with competition could mean buying out the competition or vice versa, or it could also mean turning the competition into a client.

MODULE TEST 3 KEYS.

1. – b. 2. – c. 3. – c. 4. – a. 5. – a. 6. – d. 7. – a. 8. – b. 9. – d. 10. – c. 11. – a. 12. – a. 13. – d. 14. – c. 15. – a. 16. – c. 17. – b. 18. – a. 19. – b 20. – c. 21. – d. 22. – b. 23. – c. 24. – a. 25. – c.

UNIT 9. ARITHMETIC AND NUMBER THEORY

Task 2.

1 – B, 2 – E, 3 – C, 4 – D, 5 – A.

Task 3.

1 – c, 2 – a, 3 – g, 4 – b, 5 – d, 6 – f, 7 – e.

Task 4.

1 – order, 2 – precedence, 3 – expression, 4 – multiplication, 5 – exponents, 6 – right, 7 – change, 8 – brackets, 9 – parts, 10 – addition.

Task 5. Suggested answers:

Two times four is eight. Thirty divided by six is five. Four plus seven equals eleven. Fifty five minus one is fifty four. Six by two is twelve. Sixty three divided by three is twenty one. Nine plus five is 14.

Task 7.

Part 1.

1. Linear equations with variables on both sides.

2. Getting rid of variable on one side.

3. 3x minus 7 is equal to 5x plus 4.

4. x = 5,5.

Part 2.

1. … get rid of variable on one side.

2. … get rid of the smaller coefficient.

3. … bring down the sign that comes before the number.

4. … solve any equation, which is use of inverse operations.

5. … get rid of addition and subtraction first

Part 3. See the Transcript.

Task 9.

Puzzle 1.

The smallest amount of one-dollar and two-dollar bills the cashier may give to the old man is 1x1+10x2=21.

He must give the old man a multiple of 21 i.e. 21 or 42 or 63 or 84 or 105 or 126 or 147 or 168 or 187; without exceeding 200. Out of all these numbers only 105 can be added to a multiple of 5 to sum up to make 200 altogether.

So he must give the balance of 95 in five-dollar bills.

Therefore, the cashier must give 5 one-dollar bills, 50 two-dollar bills and 19 five-dollar bills.

Puzzle 2.

The scales show their combined weight to be 170 pounds, and as the lady weighs 100 pounds more than the combined weight of the dog and baby, she must have weighed exactly 135 pounds. As the dog weighed 60 percent less than the baby, we can readily see that the baby weighs 25 pounds and the dog but 10 pounds.

Puzzle 3.

Let e > d > c > b > a be the girls weights.

NB no two girls have the same weights, otherwise there would have been duplicate weighings.

e + d must be the heaviest and e + c the second heaviest weighing.

a + b must be the lightest and a + c the second lightest weighing.

It might be the a + d or b + c could be next, fortunately we don't need to know.

The sum of the weighings is 1212 and each girl is weighed four times => a + b + c + d + e = 1212/4 = 303

c = (a + b + c + d + e) - (a + b) - (d + e) = 303 - 114 - 129 = 60

a + c = 116 => a = 116 - 60 = 56

a + b = 114 => b = 114 - 56 = 58

c + e = 125 => e = 125 - 60 = 65

e + d = 129 => d = 129 - 65 = 64

So the girls weights are: 56, 58, 60, 64 and 65.

Task 17.

1 – assume, 2 – hence, 3 – implies, 4 – gives, 5 – since, 6 – then, 7 – since, 8 – so, 9 – yields, 10 – conclude, 11 – however, 12 – therefore, 13 – hence.

Task 18.

Part 1. 1 – equals, 2 – stated, 3 – numbers, 4 – prove, 5 – definition, 6 – power, 7 – equations, 8 – times, 9 – exponentials, 10 – which, 11 – logarithm, 12 – relationship, 13 – because, 14 – so, 15 – proved.

Part 2.

$\log_a (M \cdot N) = \log_a M + \log_a N$.

Let $\log_a M = x$ and $\log_a N = y$.

Writing it as an exponential,

$a^x = M$ and $a^y = N$.

Then, lets multiply x and y:

$a^x \cdot a^y = M \cdot N$, or

$a^{x+y} = M \cdot N$.

Written as a logarithm,

$\log_a (M \cdot N) = x + y$. So,

$\log_a (M \cdot N) = \log_a M + \log_a N$.

Part 3. *See transcripts.*

Task 19.

    Part 1.

    Assume that n = 6d.

    Therefore, n = 2(3d).

    So, **if** we let r= 3d, we see **that** n= 2r **for** some integer r, **which** means that n **is** even.

    Part 2. 1 – b, 2 – c, 3 – a, 4 – d, 5 – d, 6 – a, 7- c, 8 – b, 9 – c, 10 – b.

    Part 3. 1 – suppose, 2 – thus, 3 – yields, 4 – so, 5 – can, 6 – the, 7 – both, 8 – if, 9 – contradicts, 10 – forced.

Task 20. Suggested answer:

    They lost 7 pence altogether

    Suppose each lady has x apples

    $x/2 + x/3 - 2(2x/5) = 7$

    $15x + 10x - 24x = 210$

    $x = 210$

    Note: Mrs. Johns lost 21 pence.

Task 21.

    1– c, 2 – a, 3 – b.

Task 22.

    Suggested answer:

    Let the first girl be x, the first boy is 2x, the second girl is 3x (since x plus 3x = 4x twice the first boys age) boy three is 6x (6x + 2x = 8x twice girl 1 and 2 ages) and the third girl is 12x (twice boy one and two). Therefore 21 = 12x, 21/12 is 1.75 making the first boys age 3.5 years.

WORKBOOK

Task 1.

    Part 1. 1 – counting, 2 – division, 3 – logarithmic, 4 – operations, 5 – properties, 6 – relation, 7 – discrete, 8 – applied.

    Part 2. 1 – concerned, 2 – numbers, 3 – counting, 4 – foundation, 5 – distinction, 6 – use, 7 – operations, 8 – solving, 9 – Number, 10 – rest.

    Part 3. Suggested answers: 1 – actions, 2 – ideas, 3 – elementary, 4 – daily, 5 – underline, 6 – stage, 7 – expressing, 8 – proclaim, 9 – title, 10 – widely.

Task 2.

    Part 1. 1 – F, 2 – T, 3 –T, 4 – F, 5 –T, 6 – F, 7 – T.

Part 2.

A proof is a deductive argument for a mathematical statement.

A conjecture is an unproven statement that is believed true.

Direct proof is a proof, where the conclusion is established by logically combining the axioms, definitions, and earlier theorems.

Proof by mathematical induction is a proof, which applies the induction rule repeatedly, starting from the independently proved base case.

Proof by contradiction is a proof which shows that if some statement were true, a logical contradiction occurs.

Proof by construction is the construction of a concrete example with a property to show that something having that property exists.

Proof by exhaustion is a proof, where the conclusion is established by dividing it into a finite number of cases and proving each one separately

Part 3.

Title	Methodology	Example of application
Direct proof	The conclusion is established by logically combining the axioms, definitions, and earlier theorems	Proves that the sum of two even integers is always even
Proof by induction	applies the induction rule repeatedly, starting from the independently proved base case	proves that a property known to hold for one number holds for all natural numbers
Proof by contradiction	shows that if some statement were true, a logical contradiction occurs	shows that $\sqrt{2}$ is an irrational number
Proof by construction	constructs a concrete example with a property to show that something having that property exists	proves the existence of transcendental numbers by constructing an explicit example
Proof by exhaustion	the conclusion is established by dividing it into a finite number of cases and proving each one separately	proof of the four colour theorem was a proof by exhaustion with 1,936 cases.

Task 4. Suggested answers:

Part 1.

Equation: $2x - 4 = 10$

1. Add 4 to both sides of the equation:

$$2x = 14$$

2. Divide both sides by 2:

$$x = 7$$

The answer is $x = 7$.

Part 2.

Equation: $\dfrac{3}{4}x + \dfrac{5}{6} = 5x - \dfrac{125}{3}$

1. Multiply both sides by the lowest common multiple of 4, 6, and 3, or 12.

$$12\left(\dfrac{3}{4}x + \dfrac{5}{6}\right) = 12\left(5x - \dfrac{125}{3}\right)$$

3. Simplify:

$$12\left(\dfrac{3}{4}x\right) + 12\left(\dfrac{5}{6}\right) = 12(5x) - 12\left(\dfrac{125}{3}\right)$$

$$3(3x) + 2(5) = 60x - 500$$

$$9x + 10 = 60x - 500$$

4. Subtract $9x$ from both sides of the equation:

$$10 = 51x - 500$$

5. Subtract $9x$ from both sides of the equation:

$$510 = 51x$$

6. Divide both sides by 51:

$$x = \dfrac{510}{51} = 10$$

The answer is $x = 10$.

Part 3.

Equation: $2(3x - 7) + 4(3x + 2) = 6(5x + 9) + 3$

1. Complete multiplication.

$$6x - 14 + 12x + 8 = 30x + 54 + 3$$

7. Group like terms on each side of the equal sign.

$$18x - 6 = 30x + 57$$

8. Subtract 18 x from both sides of the equation.

$$-6 = 12x + 57$$

9. Subtract 57 from both sides of the equation.

$$-63 = 12x$$

10. Divide both sides of the equation by 12 and simplify.

$$x = -\frac{63}{12} = -\frac{21}{4}$$

The answer is $x = -\frac{21}{4}$.

UNIT 10. DISCRETE MATHEMATICS

Task 2.

1 – C, 2 – A, 3 – D, 4 – B, 5 – C.

Task 3.

1 – d, 2 –f, 3 – a, 4 – g, 5 – b, 6 – h, 7 – e, 8 – c.

Task 4. Suggested answers:

1 – theoretical, 2 – collective, 3 – possible, 4 – various, 5 – different, 6 – optimal, 7 – fair, 8 – growing, 9 – applicable, 10 – other.

Task 5.

If the population of men is 45 %, the population of women is 55 %.

If x = 2, then 3 - x = 1.

If you score 95 % at the lesson, you will receive A.

If the total number was given, we could solve the equation.

If he had known all the variants, he would have chosen the other one.

If you find x, you will find y and z.

If we add two odd numbers, we receive even number.

If the hypothesis was true, the conclusion would be true.

Task 7.

Part 1. 1 – F, 2 – F, 3 – T, 4 – T, 5 – F, 6 – T, 7 – T.

Part 2. 1 – algorithms, 2 – experience, 3 – patterns, 4 – computational, 5 – payoff, 6 – possible, 7 – economically, 8 – basis, 9 – mathematics, 10 – generating, 11 – symbolic, 12 – analysis, 13 – permutations, 14 – mappings, 15 – combinatorics.

Part 3.

1. First of all, they experience the beauty of elegant mathematical patterns and elegant computational procedures. Then, they receive a practical payoff when

their theories make it possible to get other jobs done more quickly and more economically.

2. The theories can make it possible to get other jobs done more quickly and more economically.

3. Permutations, Trees, Streams, Words and Mappings

4. Generating Functions and Real Ssymptotics, Symbolic Method for defining Generating Functions .

Task 8. Suggested answers:

If I were given Nobel Price, I would spend money on further investigations.

If there were no calculating machines, people would have to do mental calculations.

If I had to choose only one science to study, I would choose Mathematics.

If every person was a mathematical prodigy, there would be more discoveries in the world.

If I could analyze all the probabilities of any events, I would be able to predict disasters and prevent them.

Task 9.

Puzzle 1. You have 26 different choices for the first letter, 26 choices for the second, and so on. From the Product Rule, it follows that there are 26^8 different words, if no letter is similar. Provided that the 8th letter must be equal to the first, the answer is 26^7.

Puzzle 2. Firstly, let`s work out how many ways there are without the condition of two people not sitting together. There are 5 possibilities for the first place, 4 for second and so on, so the number of ways is 5 x 4 x 3 x 2 x 1 = 120. The next step is to work out how many of these possibilities have the two people sitting next to each other. There are 4 ways in which two people can sit next to each other. For each of these ways there are two possibilities, one with one person on the right, and the other with them on the left. For each of these 8 ways, there are 3 x 2 x 1 = 6 ways the other people could have sat. So, there are 8 x 6 = 48 ways in total. 120 – 48 = 72. So, the answer is 72.

Puzzle 3. If repetition is allowed, the total number of combinations is $6^4 = 1296$.

If repetition is not allowed, for the first digit we have 6 options, for the second digit (provided that the one used option cannot be used again) – 5 options, for the third digit – 4 options, and for the fourth digit – three options. So, the total amount of combinations would be 6x5x4x3=360.

Task 10.

1 – is, 2 – are, 3 – studies, 4 – excludes, 5 – be counted, 6 – dealing, 7 – studied, 8 – applied, 9 – increased, 10 – operate, 11 – are, 12 – are.

Task 11.

1. Not to treat Mathematics as the relationships that humans make between concepts we abstract from day to day life.

2. The earliest known mathematics appear to be attempts to quantify time and make calendars, with other early efforts directed towards accounting, astronomy, and engineering.

3. Mathematics is nothing more and nothing less a tool that's useful for humans in solving particular problems.

4. Use of Mathematics to build models of reality that may not actually have any bearing on what's real

5. if we encounter other systems of intelligence that they'll have the same concepts of math that we do

Task 15.

1 – C, 2 – G, 3 – B, 4 – E, 5 – A, 6 – D, 7 – F.

Task 17.

1 – d, 2 – c, 3 – a, 4 – b.

Task 19.

Good qualities: 1, 4, 6, 7, 9, 13.

Bad qualities: 2, 3, 5, 8, 10, 11, 12, 14.

Task 21.

1 – E, 2 – B, 3 – D, 4 – A, 5 – C, 6 – F.

WORKBOOK

Task 1.

Part 1. 1 – patterns, 2 – other, 3 – mostly, 4 – variety, 5 – concerning, 6 – dealt with, 7 – gave, 8 – widely.

Part 2.

Mathematical structures, distinct values, countable sets, rational numbers, related notions, graph theory, computer science, discrete mathematics, be enumerated by integers, be applied to the field.

Part 3.

1 – continuous, 2 – dealing, 3 - calculus, 4 – characterized, 5 – probabilities, 6 – combinatorics, 7 – computation, 8 – relations, 9 – implementations, 10 – efficiencies, 11 – importance.

Task 2.

Part 1.

1 – graph theory, 2 – logic, 3 – logic, 4 – cryptography, 5 – operations research, 6 – theoretical computer science.

Part 2.

1 – c, 2 – a, 3 – d, 4 – b, 5 – g, 6 – h, 7 – e, 8 – f.

Part 3.

#	Problem	Sphere	Description	Date of development/proof
1	Four colour theorem	graph theory	proved by Kenneth Appel and Wolfgang Haken, using substantial computer assistance	Stated 1852, proved 1976
2	Hypothesis that the axioms of arithmetic are consistent	logic	Gödel's second incompleteness theorem, proved in 1931, showed that this was not possible	1931
3	Hypothesis that a given polynomial Diophantine equation with integer coefficients has an integer solution	logic	In 1970, Yuri Matiyasevich proved that this could not be done.	1970
4	Public-key cryptography	cryptography	Was stimulated by the Cold War	Decades after the Cold War
5	Critical path method	operations research	Is used as a tool in business and project management	1950
6.	P = NP problem	theoretical computer science	one of the most famous open problems in theoretical computer science	Current time

MODULE TEST 4 KEYS.

1. - a. 2. - a. 3. – c. 4. – c. 5. – a. 6. – b. 7. – d. 8. – d. 9. – c. 10. – d. 11. – b. 12. – a. 13. – a. 14. – c. 15. – b. 16. – d. 17. – d. 18. – a. 19. – a. 20. – d. 21. – b. 22. – b. 23. – a. 24. – c. 25. – c.

FINAL TEST KEYS.

Task 1. 1. – T. 2. – F. 3. – T. 4. – F. 5. – F. 6. – T. 7. – F. 8. – T. 9. – F. 10. – T.
Task 2. 1. - B 2. – C 3. – A 4. – D 5. – B 6. – B 7. – A 8. – C 9. – D 10. – C.
Task 3.

1. The employees.........*have to follow*..................... safety rules at the workplace.

2. The CPU ....*is responsible for*......................... interpreting codes.

3. An expert system ....*was created to*.......... translate natural languages.

4. The company expanded ....*without analyzing*........ the risks.

5. I couldn't make a transaction ....*as the bank was*............. closed.

Task 5–7: Open tasks.

TRANSCRIPTS

UNIT 1. COMPUTER HARDWARE AND SOFTWARE

Task 6.

Source: http://www.youtube.com/watch?v=76J0dNZ0MZc

An operating system is composed of software that is necessary to run your computer. Operating system software controls your computer's hardware components, including peripheral hardware attached to your computer, and all other software being used on your computer.

Traditional operating systems, such as disk operating system, or DOS, were text-based, and usually consisted of commands you had to remember, and computer responses that were very brief. Most modern operating systems, such as Windows Vista and Windows XP, have a user-friendly graphical user interface, or GUI.

When you install a piece of application software on your computer, it usually uses the element of the GUI that come with the operating system, and adds it own graphical user interface elements. A GUI sometimes uses metaphors for objects familiar in real life, such as the desktop, or the view through a window. Elements of a GUI include such things as: windows, menus, buttons, scroll bars, icons, and wizards. With the increasing use of multimedia as part of the GUI, sound, voice, motion video, and virtual reality interfaces seem likely to become part of the GUI for many applications. GUIs are easier to use, faster, and accommodate better organization of your applications and files than traditional operating systems.

Task 18.

Source: http://www.youtube.com/watch?v=JwbI4Zzd4r8

My name is Stephaney and I work with CMAT solutions. Today I am going to show you how to create a spreadsheet in Microsoft Word. In order to create a spreadsheet in Word, simply open up Word, go to 'File', 'New blank document'. You can create a spreadsheet in a couple of different ways. You can go to 'Table', 'Insert Table', select the number of columns and select the number of rows you wish. In this case we are going to have 5 columns with 2 rows in our spreadsheet. Click 'Ok' and it will automatically create a table or a spreadsheet inside the Word document for you.

The other way to create an Excel spreadsheet in a Word document is by opening up Excel, starting a new Workbook, typing your data; you can select the cells of your spreadsheet, right-click, select 'Copy', open up Word, create a new blank document and then right-click and paste. And your spreadsheet will paste in your Word document.

And it's as easy as that. In order to create a spreadsheet in Word, you can simply do an 'Insert table' and select the number of columns and rows you wish or you can create a spreadsheet in Excel and copy and paste.

UNIT 2. PROGRAMMING

Task 7.

Source: http://bigthink.com/videos/why-i-created-c

In the really old days, people had to write their code directly to work on the hardware. They wrote load and store instructions to get stuff in and out of memory and they played about with bits and bytes and stuff. You could do pretty good work with that, but it was very specialized. Then they figured out that you could build languages fit for humans for specific areas. Like they built FORTRAN for engineers and scientists and they built COBALT for businessmen. And then in the mid-'60s, a bunch of Norwegians, mostly Ole-Johan Dahl and Kristen Nygaard thought why can't you get a language that sort of is fit for humans for all domains, not just linear algebra and business. And they built something called SIMULA. And that's where they introduced the class as the thing you have in the program to represent a concept in your application world. So if you are a mathematician, a matrix will become a class, if you are a businessman, a personnel record might become a class, in telecommunications a dial buffer might become a class—you can represent just about anything as a class. And they went a little bit further and represented relationships between classes; any hierarchical relationship could be done as a bunch of classes. So you could say that a fire engine is a kind of a truck which is a kind of a car which is a kind of a vehicle and organize things like that. This became known as object-oriented programming or also in some variance of it as data abstraction.

Task 18.

Source: http://www.youtube.com/watch?v=7BKUn5TzAIE

Hi, I'm Carla from ReQtest, today we are going to discuss how to write effective test cases. Writing effective test cases will help whoever is executing the test case. Here are a few tips to help you write better and more effective test cases. To start off, you should have 3-8 steps in a test case. If you only have a couple of test steps, use a checklist instead. It will work just as well.

When you write a test case, you don't need to specify the expected result for each test step, if the result is obvious. However, when testers report defects based on the test case, they should indicate which test step failed. This will make troubleshooting easier.

If your test case has too many steps you should break it up into smaller sets. Why? Well, if there are a whole bunch of steps and an error occurs somewhere, it gets confusing for the developer who has to fix the bug as well as future testers who would have to repeat all the steps to test it. Lastly, only use pre-conditions if you need them. For example, if you have to load a set of customers into the system before testing begins then you need pre-condition. If not, leave the field it blank.

So that's it. Follow these tips and I'm sure you will be writing effective test cases in no time.

UNIT 3. EXPERT SYSTEM

Task 7.

Source: http://vimeo.com/43587551.

Part 1.

The objective of this video is to introduce COGITO. COGITO is expert system semantic intelligence platform. It is a technology that takes any kind of text input in any kind of format and performs a deep linguistic analysis by going through all the different steps which lead up to the semantic analysis what is then able to understand the meaning of words based on their context. The outcome of the analysis is the conceptual map, basically, a structured representation of the content, which is then used to run different kinds of applications from semantic searchers, to automatic categorization, to competitive intelligence platforms, to natural language interfaces – all which enable a very effective, fast and precise automatic management of unstructured information.

Part 2–3.

In order to understand the unique features of COGITO, let's analyse sample sentences using the interface on the actual engine. If I write the following sentence: 'The seats of my lousy Chevy are actually great', the system, because it has a deep understanding of language, is able to understand that in this sentence there is a direct relationship that links 'the seats' with 'great'. So from the analysis of this sentence the system understands that what is 'actually great' are 'the seats', and what is 'lousy' is 'my Chevy'. So the first feature of COGITO semantic technology is the understanding of the relationships between the different concepts within a sentence.

The second important feature of COGITO is its capability to perform full disambiguation. For example, if I write the sentence: 'The jaguar eats meat', based on the context it is able to understand from the text that a jaguar is a panther, which is an animal, and that when it 'eats', it eats with a mouth, and that the 'meat' is

flash of an animal. So, based on the context, the system is able to understand that jaguar is an animal and then go on to perform full disambiguation on the rest of the content.

No, if I make a change, and write something like 'The jaguar eats gas'', the system is able to understand that in this case 'Jaguar' is a luxury car, 'eat' means 'to consume', and 'gas' is 'gasoline'. So, the second important aspect of COGITO is its capability to perform full disambiguation.

Task 18.

Source: http://www.youtube.com/watch?v=D2RHfzBLRzg

The best way to start your CV is with a profile statement. Use a short descriptive statement that grabs attention and really sells you to the recruiter. This gets them interested and wanting to read more about you. A profile statement is a great way to encourage your prospective employer to keep on reading. Keep it brief and interesting – but remember you need to be able to expand on your profile statement points at the interview.

When providing an overview of your employment history, all you need to give are employers' names, dates and job titles. Don't waste valuable time going into detail with full job descriptions or specific responsibilities; you can do this at the interview stage. Highlight your previous responsibilities concentrating on the skills and strengths you acquired throughout your employment history.

A brief summary of your education is important too especially for younger people as most of your experience comes from your time in education. Make a big deal of your achievements; remember this CV needs to sell you to the recruiter. What is so good about you that they should invite you in to see them? What exactly have you done that is worth telling people about?

Including your qualifications. This is very important as they demonstrate a commitment to delivering an objective, as well as an ability to work hard in pursuit of a goal. These qualities are of great interest to any employer recruiting for any type of job. Show how you have used any training you received in a real working environment, but don't simply write a list of courses you have been on. Anyone can write a list, and anyone can attend a course, only people who really understood the training can demonstrate putting it into practice for real. Feel free to provide a brief insight into no more than three of your interests, but don't go overboard. Remember you're applying for a job not membership of the local sports team!

Finally, and probably most importantly, your contact details. How else are they going to get in touch to offer you the interview?

UNIT 4. COMPUTER NETWORKS

Task 7.

Source: http://www.youtube.com/watch?v=9LhkW_dkZvU

Today we are going to talk about what is a computer router. Computer router is a device that you have to have in order to have a network. What is a network? A network consists of a number of computers that are connected together to share information or work on common applications or projects. You could also have printers on your network and other devices. What a computer router is used for, is to take the data that is being transmitted between the computers and make sure that it gets routed to the right computers. This is done by a scheme called addressing and it uses a certain type of a protocol. These days we use TCP/IP protocol, which allows the data to flow over a cable and go between computers. When computer is connected to a router, all the computers that it wants to talk to will also be connected to that router.

There are various types of routers. We have, what is called, wired routers and wireless routers. Wired router will only transmit data if you have a cable - (I have a cable right here in front of me) – an Ethernet cable. So, you have to have an Ethernet cable in order for a wired router to work. On a wireless router you could use either a cable or just use radio waves that come out of a wireless router. However, what you have to remember with a wireless router that you have to bring the signal in first – and that is going to come in through a cable. Wireless routers have to be provided with the information through a cable and then they transmit it out by radio waves. So, there are two different types of routers. We most commonly know wireless routers at homes.

UNIT 5. THE INTERNET

Task 6.

Source: http://www.youtube.com/watch?v=OPltpdu9KGM

In 1972, the first *e-mail* was sent. Soon, the Internet arrived, a free global space to share information, ideas and amusing pictures of cats. Before the Internet, English changed through people speaking it, but the *Net* brought typing back into fashion and hundreds of cases of repetitive strain injury. Nobody had ever had to *download* anything before, let alone use a *toolbar*, and the only time someone set up a *firewall*, it ended with a massive insurance claim and a huge pile of charred *wallpaper*.

Conversations were getting shorter than the average attention span. Why bother writing a sentence when an abbreviation would do and leave you more time

to *blog*, *poke*, and *reboot* when your *hard drive* crashed? In my humble opinion became *IMHO*, by the way became *BTW*, and if we're honest that life-threatening accident was pretty hilarious, simply became *FAIL*.

Some changes even passed into spoken English. For your information, people frequently ask questions like, "How can *LOL* mean laugh out loud and lots of love?" If you're gonna complain about that, then *UG2BK* (You got to be kidding).

Task 18.

Source: http://video.about.com/esl/Learn-ESL--Tips-for-Writing-a-Business-Memo.htm

"Memo" is a short form of the word "memorandum." Generally speaking, a memo is an inter-office or internal written communication for a company or institution. It is prepared by a partner or employee.

Questions Before Writing a Memo

Before sitting down to write a business memo you need to ask yourself two questions:

1. *What* is the intended purpose of the business memo that I plan to write?

2. *Who* is the intended audience? In some cases, not everyone in the company will be a recipient of the memo.

Once you have gathered the necessary facts and thought about and answered the above two preliminary questions, you can begin composing your memo. Keep in mind that a memo is not a business letter nor does it follow the format of a letter. Rather, it needs to be written in short, succinct sentences so that the points you need to make are made quickly and clearly. Keep in mind at all times, the K.I.S.S. principle, which stands for keep it short and simple.

You will likely prepare several drafts of your memo. It is a good idea to have someone else in your office proofread your memo for punctuation, flow, grammar and general overall appearance before you present the final memo.

Generally, there are 3 basic components to memos:

1. The Heading – the top of the page should have the word "Memo?" written on it. Under the word "Memo" will be four separate lines. The first is the "To" line. Here you list all of the recipients within your office who will be receiving a copy of the memo. Next is the "From" line. Here you list your name or initials. The third line is the "Date" line. Put in the date you complete the memo. The fourth line is the "Re" or "Subject" line. Here you list what your memo is about. Be specific as to what topic or issue you are writing about. The more specific you are, the quicker a recipient will be to grasp the issue you are trying to communicate.

2. The Main Body – This is the core section. List your key concerns first. Put in some details as to what is in issue, but keep the KISS principle in mind. Business writing is about communication, so make sure that every sentence is concise.

3. The Closing – List your recommendations for how to address the core issues or problems. List the steps that need to be taken, by when and by whom. You may choose to put back-up information such as a chart or statistics in another document that can be attached to your memo, but if you do so, be sure to make reference to this fact in the closing. Once you have completed writing the business memo, ask yourself if you have fully answered the preliminary questions clearly. Who was the memo intended for and was the purpose fully met.

As a memo is not a letter, salutary remarks are not needed. Make good use of formatting by underlining sections and key points. Spell check and thoroughly proofread the document before it leaves your desk. You may want to include your email address and phone number in the closing for the convenience of your colleagues.

UNIT 6. BUSINESS AND ENTERPRISE

Task 7.

Source: http://www.youtube.com/watch?v=MXQheBSTGt0

The faces behind Microsoft's re-organization.

The reorganization Microsoft Corp has announced represents the most sweeping re-structuring of the world's largest software company since 2008. The move is designed to better align Microsoft's operations, with Chief Executive Steve Ballmer's stated goal of becoming a "devices and services" company. Microsoft's stronghold of providing software for PCs is under threat as consumers and corporations increasingly turn to mobile devices, such as smart phones and tablets, and to Web-based software.

Gamers Can't Handle the New Female Head at Xbox

Microsoft's new company reorganization promotes Julie Larson-Green, a 19-year company veteran, to head up Xbox—a position recently left vacant by Don Mattrick in a move that has a lot of gamers very, very upset because she's a woman, who supposedly has no gaming experience. When the news hit the social gaming news site N4G, commenters were quick to point out her shortcomings.

Microsoft to unveil big management reorganization

Microsoft will unveil its biggest management reorganization in at least five years, to better compete in a world of mobile devices and Web-based services. The changes will shift the duties and responsibilities of many top Microsoft executives and are intended to eliminate overlap within the 98,000-employee company.

UNIT 7. BANKING

Task 6.

Source: http://www.youtube.com/watch?v=ddqh7D4EGdQ

Banking used to be a tremendous hassle. Just a few years ago, you'd have to rush to your bank, hoping to make it before closing time. The Internet has made banking extremely convenient. You can check your balance, transfer funds, and even monitor your stocks and investments in real-time.

But with that convenience comes risk. After all, what would a criminal want more than easy access to your money? You probably already have online banking set up. Here are some simple tips to remember to help keep you – and your money – safe.

Always type in the URL of your financial institution. Phishing attacks often contain deceiving links that send you to fraudulent websites that look and function exactly like the real ones. Typing in your bank's URL manually ensures you are visiting the true site.

Use the secure connection to your financial institution. Most banks automatically take you to their secured site. If not, try using "https" when typing in the URL. Your web browser may even display a lock icon that tells you your connection is secure.

Create strong, unique passwords for each of your online accounts. We've created a video on how to do that at the Security Matters website.
Don't conduct online banking at a public computer. Use your home desktop or laptop to make your transactions or check balances.

And finally, and perhaps the simplest tip of all, remember to log out when you're finished. Always find the "Log out" option on your bank's website and click it when exiting.

Online banking is convenient and efficient. With these simple tips, you can make it a safe experience as well.

UNIT 8. MARKET AND COMPETITION

Task 6.

Source: http://www.youtube.com/watch?v=9Hxy-TuX9fs

Cost curves are always going to look the same, but other elements, like price, revenue and demand, will differ depending on the market structure that the business operates in. Are there lots of producers or only a few? Is my product just like everyone else`s or is it unique? The characteristics of a market will clue you in as to the type of market structure you`re dealing with. Really, there`s a continuum of market structures. Let`s take a look.

At one extreme, we have perfect competition. Well, if it is competitive, how many producers are we talking about? – A lot. How many is 'a lot' or 'large number'? Economists aren`t really specific about it, but a large number of producers means there is so many competitors that each one is too small to affect the market. In my mind, I tend to think of maybe a hundred and more so that each competitor has one percent or less of a market. Since nothing you do affects the market, no one really cares what you do and you are free to make decisions without worrying about how the competition will react.

How else can I recognize a perfectly competitive market? Besides having a large amount of sellers, each of those sellers will be producing exactly the same thing. In perfect competition, the product is identical, or homogeneous, or non-differentiated, no matter who produces it.

One more characteristic – it's easy for firms to come and go from the industry, that is, there`s free entry and exit. Think about it. This industry has lots of producers. Why? Because it's easy to get in and set up shop. In an industry like this, lots of producers, all producing exactly the same thing, how much market power, where market power is defined as the ability to control the price, does an individual firm have? – None. You have no ability to drive the price, because one – you're so small, and two – everyone else produce exactly the same thing that you do. Time to think – what will happen if you try to raise the price?

UNIT 9. ARITHMETIC OPERATIONS AND NUMBER THEORY

Task 7.

Source: http://www.youtube.com/watch?v=wShnYemIr28

Hi! My name is Maria, I`m a mathematician and today I`m going to explain how to solve linear equations with variables on both sides. So, if I have an equation like 3x minus 7 is equal to 5x plus 4.

The first thing you want to do is to get rid of variable on one side. So, I have a 3x and I have a 5x, and easiest thing to do to avoid negatives when possible is to get rid of the smaller coefficient. So, if I have 3 and 5, I'll get rid of 3. So because of the 3x is positive, the way that I would get rid of it according to inverse operations is by subtracting it. So, I`d subtract 3x, because when I do it 3x minus 3x will cancel itself out. So, if I subtract 3x from one side of the equation, I have to subtract 3x from another side of the equation.  I know that I can only subtract like terms, so I`m going to subtract it from 5x. So when I do that, 3x minus 3x cancels out, and I`m left with negative seven. It's really important to always remember to bring down the sign that comes before the number. Bring down the equal sign. 5x minus 3x is equal to 2x and I bring down +4. Now when the variables are on one

side, I just follow the same steps that I follow to solve any equation, which is use of inverse operations. And always remember to get rid of addition and subtraction first. So, I'm going to do minus 4 on both sides, and when I do that, I have a negative 7 minus 4 is negative 11 equals 2x. Four and minus four cancels itself out. Last step – I'm going to divide by two on both sides, and I`m going to get x equals negative eleven halves, or if I go ahead I change it into x number being negative five and a half.

Task 18.

Source: http://www.youtube.com/watch?v=vi7tnxKU4SI

We would like to prove the theorem in logarithm.

Let's say that log to the base a of M times N equals the log to the base a of M plus log to the base a of N. Stated differently, the logarithm of the product of two numbers is equal to the sum of the logarithms of the numbers.

To prove this, let's say that log to the base a of M is x, and let log to the base a of N is y. Then, by definition if the log to the base a of M is x, then a to the power of x is M. Writing it as an exponential, a to the power of y is N. Then, let's multiply these two equations. So, we get a to the power of x times a to the power of y is M times N.

And multiplying the exponentials a to the power of x times a to the power of y is a to the power of x plus y equals M times N. Now, we have an exponential, which can be written as a logarithm. So, log to the base a of M times N equals x plus y. And once we have this relationship we put x and y back into it, because x is log to the base a of M, and y is log to the base a of N.

So, log to the base a of M times N is log to the base a of M plus log to the base a of N, and we have proved the theorem.

UNIT 10. DISCRETE MATHEMATICS

Task 7.

Source: http://www.youtube.com/watch?v=Zrq-8qZks3U

I'm Bob Sedgewik, professor of Computer Science in Prinston.

"People who analyse algorithms have double happiness. First of all, they experience the sheer beauty of elegant mathematical patterns that surround elegant computational procedures. Then they receive a practical payoff when their theories make it possible to get other jobs done more quickly and more economically." - That's how Donald Knuth, who put the study of algorithms on a scientific basis over 50 years ago, described the Mathematics behind the analysis of algorithms. This course begins with the introduction to Generating Functions and Real Symptotics and then introduces the Symbolic Method for defining Generating

Functions in the context of applications and the analysis of algorithms, as well as basic structures, such as Permutations, Trees, Streams, words and Mappings. As such, it is an introduction to Analytic Combinatorics in a context of the analysis of algorithms.

GLOSSARY

UNIT 1. Computer Hardware and Software

№	*English*	*Ukrainian*
1	add	додавати
2	adjust	налаштовувати
3	application	додаток
4	approach	підхід
5	arrange	впорядковувати
6	assistance	допомога, підтримка
7	attach	додавати
8	avoid	уникати
9	brightness	яскравість
10	button	кнопка
11	calculations	обчислення
12	cellphone	мобільний телефон
13	comprehensive	зрозумілий
14	condition	умови, стан
15	consist of	складатися з
16	contents	зміст
17	Control Panel	панель управління
18	copy	копіювати
19	CPU (central processing unit)	ЦП (центральний процессор)
20	damaged	пошкоджений
21	decade	десятиліття
22	delete	видаляти
23	desktop	робочий стіл
24	device	пристрій
25	digital camera	цифрова камера
26	disable	відключати
27	display	відображати, дисплей
28	download	завантажувати
29	drag	перетягувати
30	drop-down	той, що випадає
31	edit	редагувати
32	enormously	надзвичайно
33	ensure	переконатися

34	error	помилка
35	flash memory card	флеш-пам'ять
36	flexible	гнучкий
37	flip	перевертати
38	forecast	передбачати
39	foundation	основа
40	government	уряд
41	GUI (graphical user interface)	графічний інтерфейс користувача
42	guide	керувати
43	hard-drive	жорсткий диск
44	hardware	апаратні засоби
45	hardware configuration	конфігурація апаратних засобів
46	headphone	навушник
47	image	образ
48	increase	збільшувати
49	inkjet printer	чорнильно-струменевий принтер
50	input device	пристрій вводу
51	insert	вставляти
52	install	встановлювати
53	instruction	вказівки
54	involve	включати
55	item	одиниця, предмет
56	keyboard	клавіатура
57	LCD screen	рідкокристалічний екран
58	link	зв'язок, посилання
59	lock	блокувати
60	loudspeakers	гучномовці
61	manipulate	поводитися
62	manual	керівництво
63	manually	вручну
64	manufacturer	виробник
65	memory	пам'ять
66	mouse	миша
67	move	пересувати
68	occur	відбуватися
69	operating system	операційна система
70	output device	пристрій виводу
71	package	пакування
72	pattern	модель

73	peripherals	периферійні пристрої
74	photo-editing program	програма редагування фотографій
75	pinch	щипати, розтягувати
76	pixel	піксель
77	plug in	включати в мережу
78	pop-up	той, що випливає
79	power cord	шнур живлення
80	power outlet	розетка
81	prediction	передбачення
82	preface	вступ
83	probably	вірогідно
84	process	процес, обробляти
85	processing	обробка
86	raw	сирий
87	remove	видалити
88	reset	скидати
89	resolution	роздільна здатність
90	response	відповідь
91	restore	відновлювати
92	reverse	перевертати
93	rise	підніматися
94	rotation	обертання
95	run	виконувати (про програму)
96	scroll bar	панель прокрутки
97	sequence	послідовність
98	settings	налаштування
99	software	програмне забезпечення
100	Start Button	меню «Пуск»
101	store	зберігати
102	suppose	припускати
103	Task Manager	диспетчер завдань
104	troubleshooting	пошук та виправлення несправностей
105	turn off	вимикати
106	turn on	вмикати
107	type	друкувати (на клавіатурі)
108	uninstall	видаляти
109	unit	одиниця, елемент
110	unplug	відключати
111	unstable	нестабільний

112	user guide	керівництво користувача
113	view	переглядати
114	virtual reality	віртуальна реальність
115	voice recognition	система розпізнавання голосу
116	warning	попередження
117	wireless	бездротовий
118	word-processing program	програма обробки тексту, текстовий редактор

UNIT 2. Programming

№	*English*	*Ukrainian*
1	achieve	досягати
2	add	додавати
3	ambiguous	двозначний
4	argue	сперечатися
5	art	мистецтво
6	assembler language	мова асемблера
7	behaviour	поведінка
8	binary	бінарний
9	brace	дужка
10	break down	розділяти, ламати
11	button	кнопка
12	column	колонка
13	commonly	зазвичай
14	compare	порівнювати
15	comparison	порівняння
16	compiler	компілятор
17	compiling	компіляція
18	complement	доповнювати
19	compose	складати
20	consequence	наслідок
21	consist	складатися
22	convert	перетворювати
23	CPU	центральний процесор
24	create	створювати
25	current	поточний
26	customer	клієнт
27	debugging	усунення помилок

28	defect	дефект
29	demand	вимога
30	demanding	вимогливий
31	describe	описувати
32	description	опис
33	detailed	детальний
34	develop	розробляти
35	discover	знаходити
36	display	відображати, екран
37	engineering	інженерна майстерність
38	error	помилка
39	execute	виконувати
40	expected	очікуваний
41	explain	пояснювати
42	fix	виправляти
43	flexible	гнучкий
44	functionality	функціональність
45	hard drive	жорсткий диск
46	high-level language	мова високого рівня
47	housing	корпус
48	identify	визначати
49	improve	вдосконалювати
50	include	включати
51	instructions	команди
52	intended	призначений
53	interact	взаємодіяти
54	keywords	ключові слова
55	machine code	машинний код
56	manipulate	обробляти
57	meaningful	значущий
58	motherboard	материнська плата
59	object-oriented	об'єктно-орієнтований
60	observe	спостерігати
61	outcome	результат
62	perform	виконувати
63	performance	виконання
64	pixel	піксель
65	platform	платформа
66	point	вказувати

№	English	Ukrainian
67	precise	точний
68	probability	вірогідність
69	processor	процесор
70	purely	виключно
71	refer to	відноситися до
72	release	випуск
73	remark	примітка
74	represent	представляти
75	requirements	вимоги
76	resemble	бути схожим
77	reusability	можливість повторного використання
78	review	переглядати
79	rigid	жорсткий
80	row	ряд
81	run the program	запустити програму
82	satisfy	задовольняти
83	sentence	речення
84	sequence	послідовність
85	software	програмне забезпечення
86	source code	первинний код
87	speaker	динамик
88	specify	уточнювати
89	step	крок
90	strict	жорсткий
91	subtract	віднімати
92	successful	успішний
93	tedious	стомливий
94	test case	тестовий випадок
95	turn on	вмикати
96	value	значення

UNIT 3. Expert Systems

№	*English*	*Ukrainian*
1	achievement	досягнення
2	adapt	пристосовувати
3	advertisement	оголошення
4	aim to	мати намір
5	appear	з'являтися

6	application	заява
7	approach	підхід
8	arise	виникати
9	artificial intelligence	штучний інтелект
10	assist	допомагати
11	batch method	метод групової обробки
12	be able	бути здатним
13	be based on	засновуватися на
14	carrier history	історія працевлаштування
15	clear	чіткий
16	competitive	конкурентний
17	complex	складний
18	complex systems	складні системи
19	computer science	комп'ютерна наука
20	computer-generated	створений комп'ютером
21	conduct	проводити
22	conversation	розмова
23	conversational	розмовний; діалоговий
24	criterion	критерій
25	cue word	слова-репліки
26	CV	резюме
27	database	база даних
28	decision support	підтримка рішень
29	deduce	робити висновки
30	diagnose	діагностувати
31	dialog interface	діалоговий інтерфейс
32	digitized	цифровий
33	disease	хвороба
34	distinguish	розрізняти
35	diverse	різноманітний
36	divide	розділяти
37	education	освіта
38	employer	роботодавець
39	exist	існувати
40	experience	досвід
41	expert system	експертна система
42	explanation	пояснення
43	fault diagnosis	діагностика помилок
44	fixed	фіксований

45	formulation	формулювання
46	generate	створювати
47	goal	мета
48	gradually	поступово
49	human intelligence	людський інтелект
50	imitate	імітувати
51	immediately	негайно
52	include	включати
53	inference engine	механізм логічного виводу
54	intelligence	інтелект
55	interactive	інтерактивний
56	invent	винаходити
57	investing	інвестування
58	invisible	невидимий, непомітний
59	knowledge base	база знань
60	logic simulation	симуляція логіки
61	maintain	підтримувати
62	mineral deposits	родовища мінералів
63	missing	відсутній
64	narrow	вузький
65	natural language	природна мова
66	necessary	необхідний
67	online assistant	оперативний асистент
68	overview	огляд
69	participate	брати участь
70	perform	виконувати
71	personal details	особисті дані
72	petroleum	нафта
73	prepare	готуватися
74	process	обробляти
75	process control	контроль процесу
76	provide	забезпечувати
77	qualifications	кваліфікації
78	reasoning	міркування
79	references	рекомендації
80	replacement	заміна
81	request	запит
82	require	вимагати
83	resolve	вирішувати

84	response	відповідь
85	rule	правило
86	sales	продаж; торгівля
87	semantic	семантичний
88	simulate	симулювати
89	solve	вирішувати
90	spelling	правопис
91	sufficiently	достатньо
92	supplement	доповнення
93	targeted	націлений
94	template	шаблон
95	Turing test	тест Тюрінга
96	tutorial	навчальний
97	understandable	зрозумілий
98	user guide	керівництво користувача
99	variable	змінна
100	work experience	досвід роботи

UNIT 4. Computer Networks

№	*English*	*Ukrainian*
1	acknowledgment	визнання
2	advanced	вдосконалений
3	advert	оголошення
4	allow	дозволяти
5	apply	подавати заяву
6	assume	припускати
7	authorized	авторизований
8	avoid	уникати
9	barrier	бар'єр
10	branch	гілка
11	brief	короткий
12	cable	кабель, дріт
13	Campus Area Network	кампусна мережа
14	chat room	чат
15	computer network	комп'ютерна мережа
16	computer virus	комп'ютерний вірус
17	concise	стислий
18	connection	з'єднання

19	consider	розглядати, обдумувати
20	core	ядро; ключовий
21	correspond	відповідати
22	costly	дорогий
23	cover letter	супровідний лист
24	data	дані
25	data network	мережа даних
26	data packets	пакети даних
27	decade	десятиліття
28	deploy	приводити в дію; використовувати
29	discard	відкидати
30	disturb	турбувати
31	enclosed	прикладати, додавати
32	entity	установа
33	establish	встановлювати
34	exchange	обмінювати
35	expansion	розширення
36	extranet	екстранет
37	facilitate	полегшувати, допомагати
38	feature	риса, якість
39	firewall	брандмауер
40	gateway	шлюз
41	growth	зростання
42	hacker	хакер
43	home user	домашній користувач
44	host	хост
45	hub	концентратор
46	impression	враження
47	inappropriate	невідповідний
48	increase	зростання
49	insecure	ненадійний
50	instant messaging	миттєві повідомлення
51	interfere	втручатися; перешкоджати
52	interpersonal	міжособистісний
53	intranet	інтранет
54	invaluable	безцінний
55	latency	латентність
56	letter of application	супровідний лист
57	Local Area Network	локальна комп'ютерна мережа

58	look forward	чекати
59	Metropolitan Area Network	міська мережа
60	mirror	відображати
61	mode	метод, спосіб
62	modem	модем
63	network bridge	мережевий міст
64	network switch	мережевий комутатор
65	opportunity	можливість
66	outline	окреслювати
67	pass	проходити
68	post	позиція
69	power line communication	зв'язок по лінії електропередач
70	practical application	практичне застосування
71	prevent	попереджати; запобігати
72	properties	властивості
73	prospective	ймовірний; майбутній
74	provide	забезпечувати
75	proxy server	проксі-сервер
76	radio communication	радіозв'язок
77	rely on	покладатися на; спиратися на
78	repeater	ретранслятор
79	requirements	вимоги
80	responsibility	відповідальність
81	route	маршрут
82	rule set	набір правил
83	scope	межі, рамки
84	security system	система безпеки
85	server	сервер
86	set	набір
87	set up	встановлювати
88	share	розподіляти
89	signature	підпис
90	skills	навички
91	store	зберігати
92	suitability	відповідність
93	tailor	пристосовувати
94	telecommunication	телекомунікація
95	terminate	обмежувати
96	traffic	трафік

97	trojan	троян
98	trusted	надійний, довірений
99	video conferencing	відеоконференція
100	Wide Area Network	глобальна мережа
101	wired router	дротовий маршрутизатор
102	wireless	бездротовий
103	wireless router	бездротовий маршрутизатор

UNIT 5. The Internet

№	*English*	*Ukrainian*
1	academic	академічний
2	accelerate	прискорювати
3	acceptance	прийняття
4	access	доступ
5	accessible	доступний
6	adapt	адаптувати, пристосовувати
7	approximately	приблизно
8	array	сукупність
9	auction	аукціон
10	blogging	ведення блогу
11	browser	браузер
12	capability	можливість
13	confuse	плутати
14	contain	містити
15	decentralization	децентралізація
16	disseminate	розповсюджувати, поширювати
17	diverse	різноманітний
18	dominate	переважати
19	e-business	інтернет-бізнес
20	edit	редагувати
21	email	електронна пошта
22	embedded	вбудований
23	emerge	з'являтися
24	enable	давати змогу, уможливлювати
25	extensive	широкий
26	global	глобальний
27	government	уряд
28	graphics	графіка

29	hyperlink	гіперпосилання
30	hypertext document	гіпертекстовий документ
31	Hypertext Transfer Protocol	протокол передачі даних
32	incorporation	об'єднання
33	information-sharing	обмін інформацією
34	infrastructure	інфраструктура
35	interchangeable	взаємозамінний
36	interconnected	взаємопов'язаний
37	interlinked	взаємопов'язані
38	Internet Protocol television	Інтернет-телебачення
39	interrelated	взаємопов'язаний
40	keyword	ключове слово
41	library	бібліотека
42	linked	з'єднаний
43	listing	перелік
44	medium	засіб
45	memorandum	меморандум
46	multimedia	мультимедіа
47	navigate	здійснювати пошук
48	offer	пропонувати
49	optical	оптичний
50	page	сторінка
51	peer-to-peer network	пірингова мережа, децентралізована мережа
52	population	населення
53	print publishing	друковане видавництво
54	protocol suite	набір протоколів
55	public	громадський
56	rapid	швидкий
57	redefine	переглянути, змінити
58	reference	посилання
59	release	випуск
60	repetitive strain injury	травми від постійних навантажень
61	reshape	змінювати, перетворювати
62	respond	відповідати
63	retail outlet	роздрібна точка продажу
64	search engine	пошукова система
65	serve	обслуговувати
66	several	кілька

67	social network	соціальна мережа
68	The Internet	Інтернет
69	transmission	передача
70	utilize	використовувати
71	vast	широкий
72	voice over Internet Protocol	система телефонії через інтернет-протокол
73	web feed	стрічка новин
74	web page	веб-сторінка
75	World Wide Web	всесвітня мережа
76	worldwide	всесвітній

UNIT 6. Business and Enterprise

№	*English*	*Ukrainian*
1	accountability	звітність
2	advances	досягнення
3	advertising	реклама
4	agribusiness	сільськогосподарське виробництво
5	amount	кількість
6	announce	оголошувати
7	apologize	вибачатися
8	appreciate	цінувати
9	attention	увага
10	attract	привертати
11	bankruptcy	банкрутство
12	board of directors	рада директорів
13	business letter	діловий лист
14	busy	зайнятий
15	campaign	кампанія
16	celebrity	знаменитість
17	chief executive officer	виконавчий директор
18	commit	чинити
19	company	компанія
20	complaint	скарга
21	comply	погоджуватися, виконувати
22	condition	умова
23	constitute	складати
24	consumer	споживач

25	contemporary	сучасний
26	corporation	корпорація
27	correspondence	листування
28	debt	борг
29	duty	мито
30	economy	економіка
31	elimination	ліквідація
32	employee	службовець, працівник
33	employer	роботодавець
34	enterprise	підприємство
35	etymology	етимологія
36	export	експорт
37	financial business	фінансова діяльність
38	firm	фірма
39	general partnership	повне товариство
40	good	товар
41	governance	управління
42	headquarters	орган управління
43	implement	виконувати
44	income	прибуток
45	income tax	податок на прибуток
46	influence	вплив
47	intend	мати намір
48	investigation	дослідження
49	investment	інвестування
50	invitation	запрошення
51	involve	включати
52	job	робота
53	legal	юридичний
54	legal claim	юридичний позов
55	legal entity	юридична особа
56	liability	відповідальність
57	limited liability company	компанія з обмеженою відповідальністю
58	losses	збитки
59	manufacturer	виробник
60	market sector	сектор ринку
61	member	член
62	mining	гірнича промисловість
63	mistake	помилка

64	monitor	відстежувати
65	multiple	численний
66	order	замовлення
67	owner	власник
68	ownership	власність
69	parties	сторони
70	performance	виконання
71	persuade	переконувати
72	policy	політика
73	prevalent	поширений
74	privately owned	той, що знаходиться у приватній власності
75	profit	прибуток
76	profitable	прибутковий
77	property	власність
78	protection	захист
79	provide	надавати
80	real estate	нерухомість
81	receive	отримувати
82	reorganization	реорганізація
83	repeat customer	постійний клієнт
84	replacement	заміна
85	request	запит
86	retailer	роздрібний торговець
87	sales	продаж
88	separate	окремий
89	service	послуги
90	share	акція
91	shareholder	акціонер
92	shipping	транспортування
93	sole proprietor	одноосібний власник, приватний підприємець
94	stem from	походити від
95	sue	подавати позов
96	suggest	пропонувати
97	supplier	постачальник
98	trade	торгівля
99	trade name	торгова марка
100	transaction	ділова операція

101	transportation	транспортування
102	unemployed	незайнятий, безробітний
103	utilities	комунальні послуги

UNIT 7. Banking

№	*English*	*Ukrainian*
1	account	рахунок
2	account statement	виписка з рахунка
3	annual	річний
4	assets	активи
5	ATM	банкомат
6	available	наявний, доступний
7	balance	баланс
8	bank account	банківський рахунок
9	bank	банк
10	bank loan	банківський кредит
11	banker	банкір
12	bond	облігація
13	borrow	позичати
14	cash	готівка
15	charge	призначати, вимагати (ціну)
16	cheque	чек
17	commercial bank	комерційний банк
18	compatible	сумісний
19	connection	з'єднання
20	convenience	зручність
21	credit	кредит
22	credit card	кредитна карта
23	currency	валюта
24	customer	клієнт
25	debit	дебет
26	demand	вимагати
27	deposit	вклад, депозит
28	earn	заробляти
29	e-mail	електронний лист
30	encourage	надихати
31	endanger	ставити під загрозу
32	ensure	гарантувати, переконувати

33	entrust	довіряти
34	evolve	розвиватися
35	exceed	перевищувати
36	fee	плата, збір
37	financial instruments	фінансові інструменти
38	financial market	фінансовий ринок
39	fishing	фішинг (викрадення цінної інформації)
40	header	верхній колонтитул
41	individual retirement account	особистий пенсійний рахунок
42	institution	установа
43	interest	відсоток
44	interest rate	процентна ставка
45	investment bank	інвестиційний банк
46	issue	випускати
47	lend	позичати
48	liability	відповідальність
49	loan	позика, кредит
50	log out	виходити (з системи)
51	maintain	підтримувати
52	manually	вручну
53	margin	маржа
54	mortgage	застава, іпотека
55	mortgage bank	іпотечний банк
56	national bank	національний банк
57	offer	пропонувати
58	online banking	дистанційне здійснення банківських операцій, інтернет-банкінг
59	overdraft	овердрафт, перевищення кредиту
60	overdraft limit	ліміт овердрафту
61	owned	у власності
62	pay	платити
63	payment	оплата
64	private bank	приватний банк
65	purchase	купувати
66	rate	рівень, тариф, ставка
67	recipient	одержувач
68	reflect	відображати
69	relatively	відносно
70	replace	замінювати

№	English	Ukrainian
71	restrict	обмежувати
72	retail bank	банк для фізичних осіб
73	retirement	вихід на пенсію
74	revenue	річний дохід
75	robbery	пограбування
76	run the business	вести бізнес
77	save	зберігати
78	saving account	ощадний рахунок
79	savings bank	ощадний банк
80	secondary market	вторинний ринок
81	securities	цінні папери
82	share	акція
83	shareholder	акціонер
84	similarity	подібність
85	stock market	фондовий ринок
86	subsidiary	дочірня компанія
87	sufficient	достатній
88	terminal	термінал
89	thieve	красти
90	trade	торгівля
91	transaction	банківська операція
92	turn	оборот
93	unauthorized	неавторизований
94	underwriting	гарантована купівля і розміщення цінних паперів
95	universal bank	універсальний банк
96	withdraw	відкликати, виводити (про активи, гроші)

UNIT 8. Market and Competition

№	English	Ukrainian
1	abundant	поширений
2	additional	додатковий
3	agriculture	сільське господарство
4	appropriate	відповідний
5	assume	припускати
6	barrier	перешкода
7	benchmark	стандарт, еталон

8	buyer	покупець
9	carry out	виконувати
10	change	змінювати
11	collect	збирати
12	committee	комітет
13	competition	конкуренція
14	competitive	конкурентоспроможний
15	confident	впевнений
16	consider	обмірковувати
17	copyright	авторське право
18	cost	коштувати
19	curve	крива
20	demand	попит
21	department	відділення
22	determine	визначати
23	economist	економіст
24	efficacy	ефективність
25	entry	вхід, вступ
26	erroneous	помилковий
27	exclude	виключати
28	exclusive	виключний
29	expansion	розширення
30	expensive	дорогий
31	facility	можливість
32	free	безкоштовний
33	good	товар
34	government	уряд
35	hurdle	перешкода
36	identical	однаковий, тотожний
37	improvement	вдосконалення
38	in response	у відповідь
39	indicate	визначати
40	influence	впливати
41	in-house	внутрішній
42	insufficient	недостатній
43	interdependent	взаємозалежний
44	issue	проблема
45	leverage	важіль
46	market force	ринкова сила

47	market power	ринкова влада
48	marketing strategy	стратегія маркетингу
49	marketplace	ринок
50	monopoly	монополія
51	natural resource	природний ресурс
52	oil industry	нафтова промисловість
53	oligopoly	олігополія
54	opposite	протилежний
55	outline	окреслити
56	perfect competition	ідеальна конкуренція
57	prevent	попереджати
58	price	ціна
59	producer	виробник
60	questionnaire	анкета
61	recommendations	рекомендації
62	report	звіт
63	require	вимагати
64	restricted	обмежений
65	right	право, порядок
66	seller	продавець
67	service	послуга
68	significant	значний
69	strength	сила
70	submit	подавати на розгляд
71	substitute	замінник
72	supply	пропозиція
73	survey	дослідження
74	team up	об'єднуватись
75	total utility	сукупна корисність
76	undertake	починати, проводити
77	update	оновлювати
78	weakness	недолік
79	worry	турбуватися, хвилюватися

UNIT 9. Arithmetic and Number Theory

№	*English*	*Ukrainian*
1	addition	додавання
2	advanced	досконалий, підвищеного типу

3	algebraic integer	ціле алгебраїчне число
4	applicable	придатний
5	approximate	приблизний
6	argument	аргумент
7	arise	виникати
8	arithmetic	арифметика
9	assume	припускати
10	axiom	аксіома
11	barcode	штрихкод
12	base case	основний випадок
13	brackets	дужки
14	calculations	обчислення
15	calculus	числення
16	case	випадок
17	coding theory	теорія кодування
18	combine	поєднувати
19	common	спільний, загальний
20	conclude	робити висновок
21	confirmatory	підтверджувальний
22	conjecture	припущення
23	construction	конструкція
24	contradiction	протиріччя
25	controversial	дискусійний
26	convince	переконувати
27	counting	рахунок
28	cryptography	криптографія
29	daily life	повсякдення
30	decrease	зменшувати
31	deductive	дедуктивний
32	definition	визначення
33	demonstrate	демонструвати
34	difference	різниця
35	digit	цифра
36	directly	безпосередньо
37	discrete mathematics	дискретна математика
38	distinguish	розрізняти
39	division	ділення
40	elementary	елементарний, первинний
41	encode	кодувати

42	enumerate	перелічувати
43	equation	рівняння
44	error detection	виявлення помилки
45	evaluate	оцінювати
46	exhaustion	вичерпання
47	explicit	чітко виражений
48	exponential	показниковий
49	exponentiation	зведення у степінь
50	expression	вираз
51	field	поле, величина
52	imply	мати на увазі
53	increase	збільшувати
54	instance	випадок
55	integer	ціле число
56	involve	включати
57	justification	доведення
58	linear equation	лінійне рівняння
59	logarithm	логарифм
60	logarithmic function	логарифмічна функція
61	logical	логічний
62	manipulation	операція
63	multiplication	множення
64	number	кількість, число
65	number theory	теорія чисел
66	obey	підпорядковуватися
67	occur	траплятися
68	operations	дія, операція
69	operator precedence	першочерговість дій
70	order of operations	порядок дій
71	parentheses	круглі дужки
72	percentage	відсоток, процентне відношення
73	perform	виконувати
74	precedence	першочерговість
75	prime number	просте число
76	proof	доказ
77	property	властивість
78	quantity	кількість
79	quotient	частка
80	range	межі, діапазон

81	rational number	раціональне число
82	reasoning	міркування
83	repeatedly	повторно
84	solution	рішення
85	square root	квадратний корінь
86	statement	твердження
87	subtraction	віднімання
88	sum	додавати
89	take away	віднімати
90	take power	зводити у степінь
91	theorem	теорема
92	times	помножити
93	total	сума
94	unsullied	незаплямований
95	validity	дійсність
96	value	цінність, значення
97	vinculum	горизонтальна риса
98	wireless communication	бездротовий зв'язок
99	yield	приводити до чогось

UNIT 10. Discrete Mathematics

№	*English*	*Ukrainian*
1	abstract	анотація
2	aggregation	об'єднання, агрегація
3	algorithm	алгоритм
4	appear	з'являтися
5	arbitrary	вільний, випадковий
6	ascertain	встановлювати, виявляти
7	brief	короткий
8	calculus	числення
9	cardinality	потужність множини
10	challenge	виклик
11	challenging	той, що стимулює
12	coding theory	теорія кодування
13	coefficient	коефіцієнт
14	combinatorics	комбінаторика
15	combine	поєднувати
16	computation	розрахунок

17	computer aided design	система автоматизованого проектування
18	congruence	відповідність, конгруентність
19	conjecture	припущення
20	continuous	безперервний, тривалий
21	conversely	навпаки
22	countable	злічуваний
23	decision theory	теорія рішень
24	decoding	розшифровка
25	dimensions	розміри, виміри
26	discrete	окремий, дискретний
27	discrete mathematics	дискретна математика
28	discrete steps	окремі кроки
29	distinct	особливий, окремий
30	efficiency	корисність, дієвість
31	efficient	корисний
32	encoding	шифрування
33	enumerated	перелічений
34	evasion	ухилення
35	exclude	виключати
36	execute	виконувати
37	finite	скінченний
38	framework	структура, рамки
39	game theory	теорія ігор
40	graph	графік
41	graph theory	теорія графів
42	implementation	виконання, реалізація
43	implication	висновок
44	importance	важливість
45	in contrast	у протилежність
46	inapplicable	незастосовний
47	incompleteness	незакінченість
48	indeed	дійсно
49	integer	ціле число
50	involve	включати
51	mathematical structures	математичні структури
52	natural number	натуральне число
53	nearest neighbour algorithm	метод найближчого сусіда
54	notion	поняття

55	number theory	теорія чисел
56	outcome	результат
57	preferences	переваги
58	probability	вірогідність
59	probability theory	теорія ймовірності
60	property	властивість
61	public-key cryptography	криптографія з відкритим ключем
62	quantity	кількість
63	random	випадковий
64	real number	дійсне число
65	recurrence	повторення
66	requirements	вимоги
67	separated	окремий
68	set	множина
69	set theory	теорія множин
70	social choice theory	теорія суспільного вибору
71	social welfare	соціальний добробут
72	statement	твердження
73	subset	підмножина
74	substantial	значний
75	summary	короткий виклад
76	travelling salesman problem	задача комівояжера
77	value	значення
78	vary	змінюватися
79	vertex	вершина

REFERENCES

1. Abstract (Summary) [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 23, 2014. – Access mode: http://en.wikipedia.org/wiki/Abstract_(summary)

2. Arithmetic [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 21, 2014. – Access mode: http://en.wikipedia.org/wiki/Arithmetic

3. Artificial Intelligence and Expert Systems [Electron resource]. – Access mode: http://www.perfectlogic.com/articles/AI/ExpertSystems/ExpertSystems.html

4. Assassa G. Software Engineering. Test Case Template and Examples [Electronic Resource] / Ghazy Assassa. – Access mode: http://faculty.ksu.edu.sa/ghazy/CSC342_Tools/Test%20Case%20Template.pdf

5. Bank [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: January 19, 2014. – Access mode: http://simple.wikipedia.org/wiki/Bank

6. Blenko M. W. The Key To Successful Corporate Reorganization [Electron resource] / Marcia W. Blenko, Michael C. Mankins, Paul Rogers // Forbes. – July 30, 2010. – Access mode: http://www.forbes.com/2010/07/30/corporate-reorganization-abb-ford-leadership-managing-bain.html

7. Bogomolny A. What Is Arithmetic? [Electron resource] / Alexandr Bogomolny. – Access mode: http://www.cut-the-knot.org/WhatIs/WhatIsArithmetic.shtml.

8. Bolton D. What is a Programming Language? [Electronic resource] / David Bolton. – Access mode: http://cplus.about.com/od/introductiontoprogramming/ /p/programming.htm

9. Business Letter [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 23, 2014. – Access mode: http://en.wikipedia.org/wiki/Business_letter

10. Business [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 21, 2014. – Access mode: http://en.wikipedia.org/wiki/Business

11. Carter C. How to Write a Manual from Scratch [Electronic resource] / Charles Carter. – Access mode: http://www.wikihow.com/Write-a-Manual-from-Scratch.

12. Chon M. Solving multivariate functional equations [Electron resource] / Michael Chon, Christopher R. H. Hanusa, Amy Lee // Discrete Mathematics. – Elsevier: Vol. 319, 28 March 2014. – Access mode: http://www.sciencedirect.com/science/article/pii/S0012365X13004901

13. Cleverbot [Electronic resource] // Wikipedia, the free encyclopedia. – Last modified: February 10, 2014. – Access mode: http://en.wikipedia.org/wiki/Cleverbot

14. Computer network [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 22, 2014. – Access mode: http://en.wikipedia.org/wiki/Computer_network

15. Computer Networks [Electron resource]. – Access mode: http://tecschange.org/classic/networks/network-syllabus.html

16. Computer Quotes [Electron resource]. – Access mode: http://www.brainyquote.com/quotes/topics/topic_computers.html

17. Cover Letter for an IT Systems Analyst [Electron resource]. – Access mode: http://icover.org.uk/cover-letter-for-an-it-systems-analyst/

18. Curriculum vitae [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 15, 2014. – Access mode: http://en.wikipedia.org/wiki/Curriculum_vitae

19. Dealing with spam: Confidence game [Electron resource] // The Economist. – November 18th, 2010. – Access mode: http://www.economist.com/node/ /17522616?zid=292&ah=165a5788fdb0726c01b1374d8e1ea285

20. Dennis M. A. Internet [Electron resource] / Michael Aaron Dennis // Encyclopedia Britannica. – Last updated January 11, 2013. – Access mode: http://www.britannica.com/EBchecked/topic/291494/Internet

21. Ding C. Binary cyclic codes from explicit polynominals [Electron resource] / C. Ding, Z. Zhou // Discrete Mathematics. – Elsevier: Vol. 321, 28 April 2014.

– Access mode: http://www.sciencedirect.com/science/article/ /pii/S0012365X13005311

22. Discrete Mathematics [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 17, 2014. – Access mode: http://en.wikipedia.org/wiki/Discrete_mathematics

23. Discrete Mathematics [Electron resource]. – Access mode: http://mathworld.wolfram.com/DiscreteMathematics.html

24. Doyle A. Letter of Application [Electron resource] / Alison Doyle. – Access mode: http://jobsearch.about.com/od/jobsearchglossary/g/ /letterofapplication.htm

25. Doyle A. Sample Programmer Analyst Cover Letter [Electron resource] / Alison Doyle. – Access mode: http://jobsearch.about.com/od/ /coverlettersamples/a/sampletech.htm

26. Driscoll D. L. Writing Report Abstracts [Electron resource] / Dana Lynn Driscoll. – Last edited: March 12, 2013. – Access mode: https://owl.english.purdue.edu/owl/resource/656/1/

27. Dumbill E. The Future of programming [Electron resource] / Edd Dumbill. – January 11, 2013. – Access mode: http://radar.oreilly.com/2013/01/the-future-of-programming.html

28. Email [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 23, 2014. – Access mode: http://en.wikipedia.org/wiki/Email

29. Email Cover Letter for Website Designer [Electron resource]. – Access mode: http://susanireland.com/cover-letters/hiring-manager/website-designer/

30. English Language Support: Formal Report Writing [Electron resource]. – Access mode: http://www.ryerson.ca/content/dam/studentservices/ /els/pdf/MODULE%20Acadamic%20Report.pdf

31. Expert System [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 19, 2014. – Access mode: http://en.wikipedia.org/wiki/Expert_system

32. Expert Systems [Electron resource] // Encyclopedia of Business, 2nd ed. – Access mode: http://www.referenceforbusiness.com/encyclopedia/Ent-Fac/Expert-Systems.html

33. Famous Theorems of Mathematics [Electron resourse]. – Last modified: December 14, 2012. – Access mode: http://en.wikibooks.org/wiki/Famous_Theorems_of_Mathematics/%E2%88%9A2_is_irrational

34. Fredman M. L. On computing the length of longest increasing subsequences [Electron resource] / Michael L. Fredman // Discrete Mathematics. – Elsevier: Vol. 11, Issue 1, 1975. – Access mode: http://www.sciencedirect.com/science/article/pii/0012365X7590103X

35. Frequently Asked Questions in Wireless Networking [Electron resource]. – Access mode: http://compnetworking.about.com/od/wirelessfaqs/

36. Game Theory [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 21, 2014. – Access mode: http://en.wikipedia.org/wiki/Game_theory

37. Guglielmo C. Ruckus CEO Lo on Boosting Wi-Fi, Chasing Cisco and Going Public [Electron resource] / Connie Gugliemo // Forbes. – December 7, 2012. – Access mode: http://www.forbes.com/sites/connieguglielmo/ /2012/07/12/ruckus-ceo-lo-on-boosting-wi-fi-chasing-cisco-and-going-public/

38. Hammerich K. Crossing the divide [Electron resource] / Kai Hammerich, Richard Lewis // The Economist. – October 10, 2013. – Access mode: http://www.economist.com/news/business-books-quarterly/21587760-why-culture-should-be-cool-crossing-divide

39. Haslegrave J. An evasion game on a graph [Electron resource] / Jonh Haslegrave // Discrete Mathematics. – Elsevier: Vol. 314, 6 January 2014. – Access mode: http://www.sciencedirect.com/science/article/ /pii/S0012365X13003920

40. Haynes A. Business Structure: Choose the Best for You [Electron resource] / Andy Haynes. – August 21, 2013. – Access mode: http://www.freshbooks.com/blog/2013/08/21/business-structure-choose-the-best-one-for-you/#sthash.eLCBFCSp.dpuf

41. Heakal Reem. Economics Basics: Monipolies, Oligopolies and Perfect Competition [Electron resource] / Reem Heakal // Investopedia. – Access mode: http://www.investopedia.com/university/economics/economics6.asp.

42. Henderson K. J. The Disadvantages of Information Technology in Business [Electron resource] / K. J. Henderson. – Access mode: http://smallbusiness.chron.com/disadvantages-information-technology-business-4020.html

43. How Banks Earn their Money [Electron resource]. – Access mode: http://www.risksandrewards.org.uk/background_banks_151.html

44. How to Write a Memo [Electron resource]. – Access mode: http://www.epcc.edu/tutorialservices/valleverde/Documents/Write_a_Memo.pdf

45. How to write a successful CV before applying for a job [Electron resource] // BBC News. – Last modified: November 3, 2011. – Access mode: http://www.bbc.co.uk/news/business-15573447

46. How to Write an Abstract [Electron resource] // Academic Resource Center: Tufts University. – Access mode: http://uss.tufts.edu/arc/ /HOW%20TO%20WRITE%20AN%20ABSTRACT%20for%20Tufts%20Symp.pdf

47. How to Write an Abstract [Electron resourse]. – Access mode: http://www.wikihow.com/Write-an-Abstract

48. Internet [Electron resource] // Webopedia. – Access mode: http://www.webopedia.com/TERM/I/Internet.html

49. Internet [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 19, 2014. – Access mode: http://en.wikipedia.org/wiki/Internet

50. Introduction to Programming [Electron resource] / Berkeley Foundation for Opportunities in Information Technology. – Access mode: http://www.bfoit.org/Intro_to_Programming/Programming.html

51. IT jobs [Electron resource] // The Guardian. – Access mode: http://jobs.theguardian.com/jobs/it/2/

52. Janssen C. Computer Network [Electron resource] / Cory Janseen // Technopedia. – Access mode: http://www.techopedia.com/definition/ /25597/computer-network

53. John Backus [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: December 25, 2013. – Access mode: http://en.wikipedia.org/wiki/John_Backus

54. Jones C. Apple Vs. Samsung: Who Could Win The Smartphone War? [Electron resource] / Chuck Jones // Forbes. – August 20, 2013. – Access mode: ttp://www.forbes.com/sites/chuckjones/2013/08/20/apple-and-samsung-who-could-win-the-smartphone-war/

55. Kalish D. How are businesses organized [Electron resource] / Doug Kalish. – Access mode: http://www.dougsguides.com/organized

56. Knapp A. Does Math Really Exist? [Electron resource] / Alex Knapp // Forbes. – January 21, 2012. – Access mode: http://www.forbes.com/ /sites/alexknapp/2012/01/21/does-math-really-exist/

57. Leroux S. How to Write a Formal Email [Electron resource] / Sue Leroux, Ben Rubenstein. – Access mode: http://www.wikihow.com/Write-a-Formal-Email

58. Lins S. A sequence representation for maps [Electron resource] / Sostens Lins // Discrete Mathematics. – Elsevier: Vol. 30, Issue 3, 1980. – Access mode: http://www.sciencedirect.com/science/article/pii/0012365X80902320

59. Maehara H. Euclidean embeddings of finite metric spaces [Electron resource] / Hiroshi Maehara // Discrete Mathematics. – Elsevier: Vol. 313, 6 December 2013. – Access mode: http://www.sciencedirect.com/science/ /article/pii/S0012365X13003841

60. Market forms [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: March 8, 2013. – Access mode: http://simple.wikipedia.org/wiki/Market_forms

61. Markoff J. Scientists See Promise in Deep-Learning Programs [Electron resource] / John Markoff// The New York Times. – November 23, 2012. – Access mode: http://www.nytimes.com/2012/11/24/science/scientists-see-advances-in-deep-learning-a-part-of-artificial-intelligence.html?_r=4&pagewanted=all&

62. Martins A. T. Effective Small Business Marketing Strategies [Electron resource] / A. T. Martins // Marketing Strategies. – Access mode: http://www.mytopbusinessideas.com/effective-marketing-strategies/

63. Math Glossary of Terms [Electron resourse]. – Access mode: http://math.about.com/od/glossaryofterms/g/The-Definition-Of-Arithmetic.htm

64. Mathematical Proof [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 23, 2014. – Access mode: http://en.wikipedia.org/wiki/Mathematical_proof

65. Mathematical Proof [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 23, 2014. – Access mode: http://en.wikipedia.org/wiki/Mathematical_proof

66. Memorandum [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: January 7, 2014. – Access mode: http://en.wikipedia.org/ /wiki/Memorandum

67. Monopoly [Electron resource] // Wikipedia, the free encyclopedia. – February 17, 2014. – Access mode: http://en.wikipedia.org/wiki/Monopoly

68. Muller V. Either tournaments or algebras? [Electron resource] / Vladimir Muller, Jaroslav Nesetril, Jan Pelant // Discrete Mathematics. – Elsevier: Vol. 11, Issue 1, 1975. – Access mode: http://www.sciencedirect.com/ /science/article/pii/0012365X75901041

69. Nearest Neighbour Algorithm [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: January 22, 2014. – Access mode: http://en.wikipedia.org/wiki/Nearest_neighbour_algorithm

70. Noeth R. J. Evaluating the Effectiveness of Technology in Our Schools [Electron resource] / Richard J. Noeth, Boris B. Volkov. – 2004. – Access mode: http://www.act.org/research/policymakers/pdf/school_tech.pdf

71. Nugent J. Classical Bank Robbery With a Cyber Twist [Electron resourse] / John Nugent // Forbes. – August 11, 2013. – Access mode: http://www.forbes.com/sites/ /riskmap/2013/11/08/classical-bank-robbery-with-a-cyber-twist/

72. One Microsoft: Company realigns to enable innovation at greater speed, efficiency [Electron resource] // Microsoft News Center. – July 11, 2013. – Access mode: http://www.microsoft.com/en-us/news/press/2013/jul13/07-11onemicrosoft.aspx

73. Operating System Comparison [Electron resource]. – Access mode: http://www.spamlaws.com/operating-system-comparison.html

74. Order of operations [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 19, 2014. – Access mode: http://en.wikipedia.org/wiki/Order_of_operations

75. Paulos J. A. Math Myopia [Electron resource] / John Allen Paulos // Forbes. – January 24, 2000. – Access mode: http://www.forbes.com/forbes/ /2000/0124/6502036a.html

76. Perelman L. C. Mayfield Electronic Handbook of Technical & Scientific Writing [Electron resource] / Leslie C. Perelman, Edward Barrett, James Paradis. – 2001. – Access mode: http://www.mhhe.com/mayfieldpub/tsw/l-tech.htm

77. Perfect Competition [Electron resource] // Investopedia. – Access mode: http://www.investopedia.com/terms/p/perfectcompetition.asp

78. Perner L. Price and Competition in Food Markets [Electron resource]. – Access mode: http://www.consumerpsychologist.com/food_Price_and_ _Competition.html.

79. Print me a Stradivarius [Electron resource] // The Economist. – February 10th, 2011. – Access mode: http://www.economist.com/node/18114327

80. Pythagorean Theorem [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: January 29, 2014. – Access mode: http://en.wikipedia.org/wiki/Pythagorean_theorem

81. Real Estate Charts [Electron resource]. – Access mode: http://www.jparsons.net/housingbubble/

82. Report [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 22, 2014. – Access mode: http://en.wikipedia.org/wiki/Report

83. Richmond K. K. The Power of Selling [Electron resource] / Kimberly K. Richmond. – Access mode: http://www.web-books.com/eLibrary/ /NC/B0/B67/26MB67.html

84. Rine D. C. Conditional and post algebra expressions [Electron resource] / D. C. Rine // Discrete Mathematics. – Elsevier: Vol. 10, Issue 2, 1974. – Access mode: http://www.sciencedirect.com/science/article/pii/0012365X74901253

85. Roberts E. Sample Memo Letter to Attend Meeting [Electron resource] / Emily Roberts. – March 24, 2012. – Access mode: http://www.foundletters.com/search/sample-memo-letter-to-attend-meeting

86. Rubenstein B. How to Write a Memo [Electron resource] / Ben Rubenstein. – Access mode: http://www.wikihow.com/Write-a-Memo

87. Sam Loyd Puzzles [Electron resource]. – Access mode: http://www.mathsisfun.com/puzzles/sam-loyd-puzzles-index.html

88. Samsung Electronics [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 18, 2014. – Access mode: http://en.wikipedia.org/wiki/Samsung_Electronics

89. Sandeep K. Sample Test Case [Electron resource] / Sandeep Kumar. – Access mode: http://www.docstoc.com/docs/55162489/Sample-Test-Case-Writting

90. Social Choice Theory [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: December 3, 2013. – Access mode: http://en.wikipedia.org/wiki/Social_choice_theory

91. Software Installation/Uninstallation Testing [Electron resource]. – Access mode: http://www.softwaretestinghelp.com/software-installationuninstallation-testing/

92. Spam in the fridge [Electron resource] // The Economist. – January 23rd, 2014. – Access mode: http://www.economist.com/news/science-and-technology/21594955-when-internet-things-misbehaves-spam-fridge

93. Special Semester on Applications of Algebra and Number Theory [Electron resource]. – Access mode: http://www.ricam.oeaw.ac.at/ /specsem/specsem2013/

94. Suh E. The Tower of Babel – A Comparison of Programming Languages [Electron resource] / Eric Suh. – Access mode: http://www.cprogramming.com/langs.html

95. Taleb W. M. Types of Business Letter [Electron resource] / W. M. Taleb. – Access mode: http://ru.scribd.com/doc/44436972/Types-of-Business-Letter

96. Test case example [Electron resource]. – Last modified: April 20th, 2010. – Access mode: http://www.softwaretestingsoftware.com/test-case-example

97. Test case example [Electron resource]. – Last modified: April 20th, 2010. – Access mode: http://www.softwaretestingsoftware.com/test-case-example/

98. Test Case Writing Guidelines [Electron resource]. – Last modified: January 21, 2010. – Access mode: http://wiki.openbravo.com/wiki/ /Test_Case_Writing_Guidelines

99. Test case [Electron resource] // Wikipedia, the free encyclopedia. – Last modified on 4 February. – Access mode: http://en.wikipedia.org/wiki/Test_case

100. Test Cases [Electron resource]. – Access mode: http://www.codentest.com/manualTestCases.php

101. The Difference Between the Internet and World Wide Web [Electron resource] // Webopedia. – Posted June 24, 2010. – Access mode: http://www.webopedia.com/DidYouKnow/Internet/Web_vs_Internet.asp

102. The History Of Internet Banking [Electron resource]. – December 28, 2011. – Access mode: http://www.tech2date.com/the-history-of-internet-banking.html#sthash.CMieyS2I.dpuf

103. Theorem [Electron resource] // Wikipedia, the free encyclopedia. – Last modified: February 24, 2014. – Access mode: http://en.wikipedia.org/wiki/Theorem

104. Theriault M. 6 Steps To Influence Others With Your Business Writing [Electron resource] / Michel Theriault // Forbes. – January 7, 2013. – Access mode: http://www.forbes.com/sites/allbusiness/2013/07/01/6-steps-to-influence-others-with-your-business-writing/

105. Tomforde M. Mathematical Writing: A Brief Guide [Electron resource] / Mark Tomforde. – September 6, 2007. – Access mode: http://www.math.uh.edu/~tomforde/MathWriting.pdf

106. Top 15 Most Popular Websites. February 2014 [Electron resource]. – Access mode: http://www.ebizmba.com/articles/most-popular-websites

107. Top Sites in United States [Electron resource]. – Access mode: http://www.alexa.com/topsites/countries/US

108. Types of Banks [Electron resource]. – 2013. – Access mode: http://typesofbanks.org/

109. Types of Banks Accounts [Electron resource]. – Access mode: http://typesofbanks.org/types-of-bank-accounts/

110. User Guide [Electron resource] // Wikipedia, the free encyclopedia. – Last modified on 5 February. – Access mode: http://en.wikipedia.org/wiki/User_guide

111. What is a Competitive Marketing Strategy? [Electron resource]. – Access mode: http://www.wisegeek.com/what-is-a-competitive-marketing-strategy.htm

112. What Is a Competitive Marketing Strategy? [Electron resource]. – Access mode: http://www.wisegeek.com/what-is-a-competitive-marketing-strategy.htm

113. Windows Basics: all topics [Electron resource]. – Access Mode: http://windows.microsoft.com/en-us/windows-vista/windows-basics-all-topics

114. Woodford C. Computers [Electron resource] / Chris Woodford. – Last updated: December 15, 2013. – Access mode: http://www.explainthatstuff.com/howcomputerswork.html

115. World Wide Web [Electron resource] // Encyclopedia Britannica. – Last Updated: January 3, 2013. – Access mode: http://www.britannica.com/ /EBchecked/topic/649051/World-Wide-Web-WWW

116. Writing job applications [Electron resource]. – Access mode: http://www.oxforddictionaries.com/words/writing-job-applications

117. Writing reports [Electron resource]. – Access mode: http://www2.le.ac.uk/offices/ld/resources/writing/writing-resources/reports

118. Yarov J. Chart of the Day: Where Microsoft`s Profits Come From [Electron resource] / Jay Yarow // Business Insider. – October 19, 2012. – Access mode: http://www.businessinsider.com/chart-of-the-day-microsoft-income-by-segment-2012-10

119. Zanazzi J. A short proof of Klee's theorem [Electron resource] / John Zanazzi // Discrete Mathematics. – Elsevier: Vol. 314, 6 January 2014. – Access mode: http://www.sciencedirect.com/science/article/pii/ /S0012365X13004056

LITERATURE

1. Загальноєвропейські рекомендації з мовної освіти: вивчення, викладання, оцінювання / Наук. редактор укр. видання С. Ю.Ніколаєва. – К.:Ленвіт, 2003. – 273с.

2. Закон України "Про вищу освіту": за станом на 19 жовтня 2006 р. / Верховна Рада України. – Офіц. вид. – К: Парламентське вид-во, 2006. – 64 с. – (Серія "Закони України").

3. Кредитно-модульна система організації процесу з першої іноземної мови / уклад. А.П. Максименко. – К.: Вид. центр КНЛУ, 2004. – 21 с.

4. Навчальна програма дисципліни "Іноземна мова загально технічного спрямування" / уклад. Варянко Т.В., Іванченко Л.М. – К.: НТУУ "КПІ", 2010. – 11 с.

5. Caissie K. B. A Handbook for Teaching Technical English / Caissie Kathleen Bogue // AYMAT Individual Thesis / SMAT IPP Collection. – 1978. – Paper 248. – 55 p.

6. Cotton D. Market Leader / David Cotton, David Falvey, Simon Kent. – [Third Edition]. – Pearson Longman, 2010. – 164 p.

7. Demetriades D. Information technology (Workshop) / Demetriades D. – Oxford University Press, 2002. – 94 p.

8. English for Specific Purposes (ESP). National Curriculum for Universities. – Kyiv: British Council, Ukraine, 2005. – 107 p.

9. Esteras S.R. Infotech. English for computer users / Esteras S.R. – Cambridge University Press, 2010. – 168 p.

10. Gerson S. M. Writing that Works: A Teacher`s Guide to Technical Writing / Steven M. Gerson. – Washburn: Kansas Competence-Based Curriculum Center, Washburn University, 2001. – 96 p.

11. Glendinning E. H.. Oxford English for Information Technology / Eric H. Glendinning, John Mc Ewan. – Oxford University Press, 2002. – 363 p.

12. Guffey M.E. Essentials of Business Communication / Mary Ellen Guffey, Dana Loewy. – [Eighth Edition]. – South-Western Cengage Learning, 2010. – 444 p.

13. Pearson S. Teaching Technical Writing to the Foreign-Born Professional in Industry / Sheryl Pearson // TESOL Quarterly. – 1983. – Vol 17. – No 3. – p.p. 383-399.

14. Santopietro K. Multi-level ESL classroom instruction module / K. Santopietro. – Denver, CO: Colorado Department of Education, 1991. – 137 p.

15. Shank C. Teaching in the multi-level adult ESL classroom: Module for ESL teacher training / C. Shank. – Arlington, VA: Arlington Education and Employment Program (REEP), 1993. – 234 p.

16. Socha A. B. Students` assessments of instruction: A validity study/ A. B. Socha. – Western Carolina University, 2010. – 164 p.

17. Tomlinson C.A. How to differentiate instruction in mixed-ability classrooms / C.A. Tomlinson. – Alexandria: Association of Supervision and Curriculum Development, 2001. – 123 p.

18. Tomlinson C.A. Leading and Managing a Differentiated Classroom / Tomlinson C.A., Imbeau M.B. – Alexandria: Association of Supervision and Curriculum Development, 2010. – 187 p.

19. Trappe T. Intelligent Business. Coursebook / Tonya Trappe, Graham Tullis. – Pearson Education Limited, 2005. – 177 p.

20. Wilson C. B. A Novel Approach to Teaching Technical Writing / Chad A. B. Wilson. – American Society for Engineering Education, 2012. – 19 p.