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Department  
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**PROFESSIONAL ORIENTED FOREIGN LANGUAGE**

Methodological instructions on practical classes for students of specialty

5B070400 – Computer Engineering and Software

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The present methodological guidelines are intended for students of specialty Computer Engineering and Software.

Special attention is drawn to the translation of authentic professional texts, compilation of terminological vocabulary, as well as doing lexical and grammar exercises.

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## **Introduction**

The present methodological guidelines are intended for students of specialty Computer Engineering and Software. The purpose of this work is to systematize students' knowledge of the proposed topics, to enrich their vocabulary, and to develop skills of professionally oriented foreign language communication in anticipated professional situations activities. The texts might be used in class with a teacher as well as a self-study book. It is not necessary to read all the texts in order. If you know what aspects you have difficulty with, go straight to the texts that deal with them, using the Contents to help you find the relevant text. You can use the texts in a number of ways. You can just read the text and translate it with a vocabulary below. On the other hand, if the text is not difficult for you it is not necessary to search for the words in vocabulary but to do the exercises instead, for better understanding of the text. This work covers the main thematic areas related to the field of computer technology and information technology. All the main themes of this specialty are covered here with the information from up-to-date sources available.

## **Unit1. Personal Computer**

**Exercise 1.** Read and translate the text.

### **Personal Computer**

A PC is a computing machine for operating, accessing and using the power of networks; it is also a platform for gaming and multimedia capabilities. A desktop personal computer mainly consists of two main components: a system unit, which can be combined with a monitor and external devices, often called peripherals. A peripheral device is any device connected to the system unit. The primary and necessary for the computer to work are the monitor, keyboard and mouse. Others, such as a printer, scanner, webcam and many others expand the functionality of the computer. As a rule, all additional external devices are connected to the system unit using special connectors. The system unit itself consists of internal devices called accessories. The main components of the system unit are: processor, video card, random access memory (RAM), data storage device (hard disk), main board (mother board), optical drive, case and power supply.

In addition to desktop options, in the modern computer market, there are now very popular portable or mobile computers, which include: laptops in various design variations, all-in-one PCs and tablets.

Desktop is a stationary computer that is still used, and the monitor is still installed on a desktop. However, due to the reduction in size and weight, it became possible to use rather compact and cheap desktops. In particular, many companies produce slim desktops.

“Tower” system unit is high and therefore usually located under the table. Due to the reduction in the size and weight of components, it has also become possible to reduce the size of the “tower” system units themselves. Middle towers are currently the most numerous subgroup of “tower” system units. But the slim-tower dominates the category of compact “tower” system units.

All-in-one (моноблок) is a PC where the system unit, monitor and, at present, a microphone, sound speakers, webcam are combined into one device. Such a PC takes up a minimum of space and is more attractive from an aesthetic point of view. Also, such a PC is more transportable than a stationary PC. But these PCs have relatively difficult scalability and independent technical upgrades and maintenance. For example, if an AIO (all-in-one) breaks down, its microphone, for example, then it is often possible to replace it with a working one only in a service center.

A laptop is a portable personal computer where the body combines typical PC components, including a display, keyboard and touchpad, as well as rechargeable batteries, due to which the laptop is able to work for a certain period of time off the mains. Laptops are small and lightweight.

Tablets are similar to laptops, but contain a touchscreen instead of a mechanical keyboard. Text entry and control is carried out through an on-screen

interface, often modified specifically for easy finger control. Some of the models can recognize handwritten text on the screen.

Hand-held computers are portable PCs that fit in your pocket. They are controlled by using a small in size and resolution screen, sensitive to finger pressure or a special stick-pointer, stylus. There is no a keyboard and mouse, but some models contain a miniature keyboard fixed or sliding out of the case. Now such devices are called smartphones and due to the fall in popularity of classic PDAs (personal digital assistants), are usually considered as a separate class of devices.

**Exercise 2.** Find the Russian equivalents for these word combinations:

вычислительная машина, системный блок, специальные разъемы, системный блок «Башня», оперативное запоминающее устройство, устройство хранения данных, внутренние устройства, корпус, комплектующие, небольшой по размерам и разрешению экран, блок питания, моноблок, карманные компьютеры, миниатюрная фиксированная или выдвигающаяся из корпуса клавиатура, не от сети.

Computing machine, internal devices, off the mains, accessories, a system unit, random access memory (RAM), “tower” system unit, special connectors, data storage device, miniature keyboard fixed or sliding out of the case, power supply, case, all-in-one, hand-held computers, small in size and resolution screen.

**Exercise 3.** Answer the questions:

1. What is a personal computer?
2. What are the components of a PC?
3. What are the main parts of a system unit?
4. What kind of types of PC do you know?
5. Why do companies produce slim desktops?
6. Describe all-in-one PC.
7. What is a laptop?
8. What PC do you prefer using?

**Exercise 4.** Put the words in the right order.

1. A desktop personal computer main components of two mainly consists.
2. Any device A peripheral device is connected to the system unit.
3. Of internal devices The system unit itself called accessories consists.
4. Desktop that used is a stationary computer is still, and is the monitor in stalled on a desktop still.
5. Takes up a minimum such a PC of space and from an aesthetic point of view is more attractive.
6. Tablets are contain a touchscreen instead of, but a mechanical keyboard similar to laptops.
7. Some recognize handwritten text on the screen of the models can.
8. Are in your pocket portable PCs Hand-held computers that fit.

### **Grammar. Passive Voice (to be +Ved or V3)**

The passive voice is used when we want to emphasize the action (the verb) and the object of a sentence rather than subject. This means that the subject is either less important than the action itself or that we don't know who or what the subject is. e.g. The Mona Lisa was painted by Leonardo Da Vinci.

#### **Exercise 5.** Translate the sentences paying attention to the Passive voice.

Four computers could even be programmed remotely from the other nodes (узел сети). Highway 15 was closed yesterday due to a serious road accident. A lot of corn is grown in Iowa. Each button, or key, can be used to either input a linguistic character to a computer, or to call upon a particular function of the computer. Their cars were being washed while they were in the mall shopping. New houses are going to be built in our neighborhood. The new manager had been hired before John left the company. Input devices, such as buttons and joysticks, can be combined on a single physical device that could be thought of as a composite device. When we reached the airport, we found that all the flights had been cancelled due to the storm. While the current is flowing through the wire, the latter is being heated.

### **Unit 2. What is a Software Engineer?**

#### **Vocabulary**

software engineer – специалист (инженер) по программному обеспечению

computer systems software - программное обеспечение компьютерных систем

applications software - прикладное программное обеспечение

user-focused programs - программы, ориентированных на пользователя

middleware - промежуточное программное обеспечение

network control systems - системы управления сетью

to be good at both left and right-brained thinking - хорошо владеть как левым, так и правым полушарием

to be well-versed in - хорошо разбираться в

debugging software - программное обеспечение для отладки

testing software - программное обеспечение для тестирования

#### **Exercise 1.** Read and translate the text

#### **What is a Software Engineer?**

Software engineering is a branch of computer science, which includes the development, and building of computer systems software and applications software. Computer systems software is composed of programs that include computing utilities

and operations systems. Applications software consists of user-focused programs that include web browsers, database programs, etc.

Software engineers have extensive knowledge of programming languages, software development, and computer operating systems, and they apply engineering principles to software creation. By applying these engineering principles to every stage of the development process, from requirements analysis to the software process, they can create customized systems for individual clients. A software engineer applies mathematical analysis and the principles of computer science in order to design and develop computer software.

There are many types of software that a software engineer can develop, such as operating systems, computer games, middleware, business applications and network control systems. Changes in technology and new areas of specialization keep this profession evolving at a rapid pace.

Software engineers can be divided into two categories.

#### *Applications Engineers.*

Applications engineers create or adapt applications for businesses and organizations by analyzing the end user's needs. They will design, build, install, and maintain these applications or programs.

#### *Systems Engineers*

Systems engineers coordinate the creation, maintenance and growth of a business or organization's computer systems. They coordinate each department's needs, suggest technical direction, and set up any networks that link up computers with the company.

Being a software engineer is a great career choice for someone who is exceptionally good at both left and right-brained thinking (analytical skills as well as problem-solving skills). Software engineers are instinctive problem-solvers, good at working with others and focused on seeing issues through to their successful completion.

A software engineer should be well versed in:

- Programming and coding
- Fundamentals of computer science
- Design and architecture
- Algorithms and data structures
- Information analysis
- Debugging software
- Testing software

**Exercise 2.** Underline the correct words.

1. Computer systems software is composed of computing utilities and *operations systems/direct systems*.

2. *Systems software/applications software* consists of user-focused programs that include web browsers, database programs.

3. *Software engineers/mining engineers* have extensive knowledge of programming languages, software development, and computer operating systems.

4. A software engineer applies *mathematical analysis/deduction analysis* and the principles of computer science.

5. *Applications engineers/systems engineers* coordinate each department's needs, suggest technical direction, and set up any networks that link up computers with the company.

6. Technology expansion and new areas of specialization keep profession of software engineer to develop at a *deliberate/rapid* pace.

7. *Sewing skills/analytical skills* are important in the job of software engineer

**Exercise 3.** Make up sentences of your own with the words from the Vocabulary.

### **Grammar. The Gerund.**

The Gerund is one of a non-finite forms of the verb. The Gerund can be the subject, object or complement of a verb.

**Exercise 4.** Rewrite each of these sentences as in the example.

a. *Example:* One of the most important functions of a computer is to process large amounts of data quickly.

Processing large amounts of data quickly is one of the most important functions of a computer.

1. One of the key functions of the operating system is to establish a user interface.

2. The task of a systems analyst is to investigate and analyze business problems.

3. The responsibility of software testers is to anticipate all the pitfalls before work begins.

4. An important function of the operating system is to manage the computer's resources.

5. The main reason for installing more memory is to allow the computer to process data faster.

b. *Example:* To manage the computer's resources is one of the important functions of the operating system.

One of the important functions of the operating system is managing the computer's resources.

1. To design and to program system-level software is the task of software engineers.

2. To communicate directly with the hardware is the role of the operating system.

3. To process information is the basic job of computers.

4. To make a detailed analysis of the employer's requirements is the responsibility of a systems analyst.

5. To maintain the link between PCs and workstations connected in a network is the role of a network support specialist.



Make up sentences of your own with the words from the Vocabulary. Grammar. Word order in English sentences. English word order is strict and rather inflexible.

As there are few endings in English that show person, number, case and tense, English relies on word order to show relationships between words in a sentence. Word order in declarative sentences serves as a basis for word order in the other types of sentences. The main minimal pattern of basic word order in English declarative sentences is SUBJECT + PREDICATE. Examples: Maria works. Time flies. The most common pattern of basic word order in English declarative sentences is SUBJECT + PREDICATE + OBJECT, often called SUBJECT + VERB + OBJECT (SVO) in English linguistic sources. Examples: Tom writes stories. The dog sees the cat.

### Unit 3. Input Devices

#### Vocabulary

to process data - обрабатывать данные  
input device – устройство ввода  
output devices - устройства вывода  
accurate and reliable - точный и надежный  
cordless mouse - беспроводная мышь  
game-pad – игровой планшет (контролёр)  
stylus – графический карандаш  
to incorporate – включать в себя, объединять

#### Exercise 1. Read and translate the text

#### Input Devices

Computer is a data processing machine and it needs user's instructions to perform any job. After processing the data it produces useful information. But in order to give data and instructions to the computer and to return the useful information to the use, different types of input and output devices can be connected with the computer.

The devices which are used to give data and instructions to the computer are called *input devices*. Various types of input devices can be used with the computer depending upon the type of data you want to enter in the computer, e.g., keyboard, mouse, joystick, light pen, etc. *Keyboard* is the most commonly used input device. It is used to enter data and instructions directly into the computer. There are 104 buttons on the keyboard which are called keys. *Mouse* is another input device which is commonly found connected with the computers. It is basically a pointing device which works on the principle of point and click. When the mouse is moved on the mouse pad, a light beam underneath reflect to give motion to the pointer on the

screen. Nowadays most of the latest models of mouse include a wheel in the middle of two buttons that help us to scroll through documents more easily. Optical mouse uses red light to track the movement of mouse for moving the pointer on the computer screen. This type of mouse is more accurate and reliable than the traditional mouse. Nowadays cordless mouse is very popular. It either uses bluetooth technology to send the data through the air to a receiver, usually plugged in USB port of the computer. We can store pictures, photographs, diagrams into the computer with the help of *scanner*. The scanner reads the image and saves it in the computer as a file. *Microphone* is an input device, which is used to record sound or voice into the computer system. You can store voice data in the computer by speaking in front of this device. *Joystick* and game-pad are also input devices which are also input devices which are used to control the movement of object on the screen. Just like mouse, these are also pointing devices. Mostly they are used for playing games on the computer. The joystick has a vertical stick with a track ball at its bottom. While playing the games on the computer, the user needs to move the objects quickly on the screen. With the movement of this vertical stick the objects can be moved in all the directions easily. *Trackball* is similar to a mouse but is mounted in a fixed position. The user spins the ball with fingers to move the pointer on the screen. A trackball technology was used in earlier computers and now it is replaced with a track pad. A *graphics tablet* is an input device, which has a special pen like stylus that allows the user to “hand draw” images into a computer system. This allows people to draw in a similar way to how they naturally would using pen and paper; something difficult to achieve with a mouse. Graphics tablets can also be used for day to day data input and are especially useful for capturing handwritten signatures. Some graphic tablets also incorporate an LCD screen for a more realistic experience. A *3D scanner* is an input device that creates a 3D model of the object scanned. Scanning can be achieved either by using lasers, light, radio waves or x-rays. This type of scanner is applied in security screenings to check for weapons or restricted things, in creating.

**Exercise 2.** Decide a computer model for 3D printing and for turning real people into game characters. If the sentences are true (T) or false (F).

1. Input devices are used to give data and instructions to the computer.
2. Keyboard and mouse are the most commonly used input devices.
3. There are 106 buttons on the keyboard which are called keys.
4. Keyboard’s principle of work is to point and click.
5. We can store pictures, photographs into the computer with the help of projector.
6. Joystick and game-pad are also output devices.
7. Trackball is similar to a mouse.
8. A graphics tablet can be used for making digital signatures.
9. A 3D scanner provides precise computers models.
10. Some graphic tablets also have OLED screen for a more realistic experience.

**Exercise 3.** Match the words and definitions.

- |              |            |
|--------------|------------|
| 1 keyboard   | 5 monitor  |
| 2 mouse      | 6 touchpad |
| 3 scanner    | 7 LED      |
| 4 microphone | 8 password |

- letters/numbers that let a person access something
- a device that is used to control a pointer or cursor
- a device that displays the images
- a device that reads images and sends them to computers
- light emitting diode
- a device that enters information into a computer
- a device that takes the input by sensing the touch of a human finger or stylus
- a device that gathers sound

**Exercise 4.** Make up sentences of your own with the words from the Vocabulary.

**Grammar. Word order in English sentences.**

English word order is strict and rather inflexible. As there are few endings in English that show person, number, case and tense, English relies on word order to show relationships between words in a sentence. Word order in declarative sentences serves as a basis for word order in the other types of sentences. The main minimal pattern of basic word order in English declarative sentences is SUBJECT + PREDICATE. Examples: Maria works. Time flies. The most common pattern of basic word order in English declarative sentences is SUBJECT + PREDICATE + OBJECT, often called SUBJECT + VERB + OBJECT (SVO) in English linguistic sources. Examples: Tom writes stories. The dog sees the cat.

Rearrange the words to make complete sentences.

- the / the / address bar / in / the / website / at / screen / of / top / the / type
- viruses / is / against / computer / my / protected
- a / writes / every / dance / she / music / blog / about / week.
- wedding / website / my / photos / my / upload / I'm / the / going / to / of / to
- bookmarks / save / in / favourites / my / sites / my / I.
- newest / my / the / email / to / version / I've / upgraded
- websites / browser / a / you / view / to / need
- spam / full / of / inbox / my / is
- enter / button / to / the / the / website / clicked / I
- picture / often / icon / an / is / a / small

## Unit 4. Output Devices

### Vocabulary

to display - демонстрировать, показывать

sharp picture – чёткое изображение

hard copy output - выводом на бумажном носителе

speakers – колонки, динамики

inkjet printer – струйный принтер

three dimensional objects – трёхмерные объекты

fluorescent tube back light - фоновый свет люминесцентной лампы

a fully back lit LED display - светодиодный дисплей с полной подсветкой

### Exercise 1. Read and translate the text

#### Output Devices

The devices which are used to display the results or information are called output devices. You can view the output on the monitor or you can print it on a paper using a printer. Monitor and the printer are the commonly used output devices. The objective of output devices is to turn computer information into a human friendly/readable form. *Monitor* is the most common output device connected with the computer to display the processed information. Pictures are displayed by using a large number of very small dots on screen called pixels. The number of pixels that a monitor can show on its screen is referred to as the resolution of the screen. Nowadays LCD monitors are more popular as their sharp picture quality. They are light weighted and flat screen monitors. *Printer* is an important output device of the computer system. It gives a printed output of the results that appears on the monitor screen. Printed output is also called hard copy output because unlike monitor, this output can be preserved even if the computer is switched off. *Laser printers* are output devices usually found in businesses and organizations. Using static electricity, the way they work is completely different to inkjet printers. Laser printers are ideal for high volume printing because they produce very high quality documents at fast speeds. Laser printers use a powdered ink/toner cartridge, not liquid ink. *3D printers* are output devices used to create three dimensional objects from a 3D computer model. The computer model can be created by using a 3D scanner, or by hand using CAD (computer aided design) modeling software. *Speakers* are categorized as output devices. These are used to listen to the music and sounds played by the computer. Normally they come in a pair and have different shapes and sizes. Speakers come as standard is most portable computing devices. Desktop computers usually require the purchase of separate speakers. Speakers and headphones aren't just for music, they also allow us to hear computer warning signals and other people when communicating via voice or video calls. *LCD screens* are made from millions of tiny blocks called pixels. Each pixel

contains a red, green and blue light filter which can be individually adjusted to create any colour when combined. This is possible because the liquid crystals found in each pixel can be manipulated to allow all, some or none of the fluorescent tube back light through to the individual RGB (red green blue) filters at the front of the screen. *LED screens* work in a similar way to LCD screens but with one major difference, the light source. A fully back lit LED display allows to localize dimming of the screen, producing deeper blacks in parts of the screen where no light is needed. In some situations LED screens are more power efficient than LCD displays.

**Exercise 2.** Decide if the sentences are true (T) or false (F):

1. Output devices are used to display the result or information on the computer.
2. Touchpad gives sound or voice input to the computer.
3. The printed copy of the output is called hard copy.
4. Cathode ray tube monitors are popular nowadays.
5. Speakers are used to listen to the music and sounds played by the computer.
6. LCDs are light weighted and flat screen monitors.
7. Headphone keep sound personal so as not to disturb others.
8. LED screens are made from millions of tiny blocks called pixels.
9. 3D printers are used at home and in offices.
10. RGB stands for Read Good Bread.

**Exercise 3.** Make up 10 questions about the text and let your partner answer them, then change parts.

**Exercise 4.** Match the words and their definitions.

- |            |              |
|------------|--------------|
| 1 printer  | 6 computer   |
| 2 monitor  | 7 headphones |
| 3 device   | 8 portable   |
| 4 nowadays | 9 LED        |
| 5 speakers | 10 touchpad  |

a) an electronic machine that can store, organize and find information, do processes with numbers and other data, and control other machines.

b) a screen that shows information from a computer;

c) an object or a piece of equipment; a piece of computer equipment

d) at the present time

e) something that is easy to carry or to move

f) a device that you slide your finger in order to move the cursor

g) a piece of equipment consisting of two earphones that makes it possible to listen to music, the radio etc.

h) a machine for printing text on paper, especially one connected to a computer

- i) the part of a radio, computer or piece of musical equipment that the sound comes out of
- j) light-emitting diode

**Exercise 5.** Write five sentences using the words from Exercise 3.

**Unit 5. How does a Microprocessor Work?**

**Exercise 1.** Read and translate the text.

**How does a Microprocessor Work?**

Microprocessor is a controlling unit of a micro-computer, fabricated on a small chip capable of performing ALU (Arithmetic Logical Unit) operations and communicating with the other devices connected to it. In simple words, a Microprocessor is a digital device on a chip which can fetch instruction from memory, decode and execute them and give results.

Microprocessor consists of an ALU, register array, and a control unit. ALU performs arithmetical and logical operations on the data received from the memory or an input device. Register array consists of registers identified by letters like B, C, D, E, H, L and accumulator. The control unit controls the flow of data and instructions within the computer.

Block Diagram of a Basic Microcomputer:

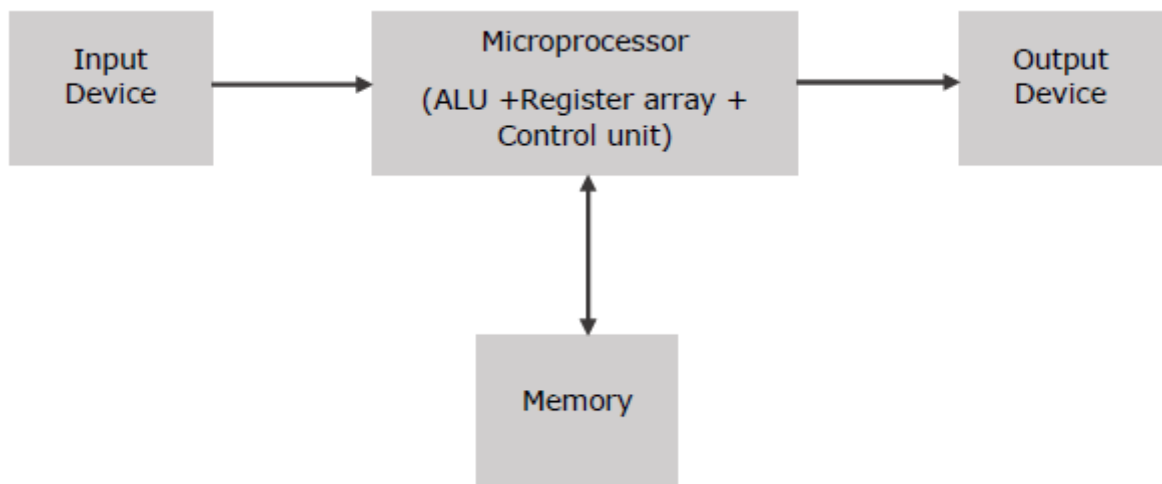


Figure 1

The microprocessor follows a sequence: Fetch, Decode, and then Execute.

Initially, the instructions are stored in the memory in a sequential order. The microprocessor fetches those instructions from the memory, then decodes it and executes those instructions till STOP instruction is reached. Later, it sends the result in binary to the output port. Between these processes, the register stores the temporarily data and ALU performs the computing functions.

List of terms used in a microprocessor. Here is a list of some of the frequently used terms in a microprocessor – instruction set – it is the set of instructions that the microprocessor can understand.

- Bandwidth – it is the number of bits processed in a single instruction.
- Clock Speed – it determines the number of operations per second the processor can perform. It is expressed in megahertz (MHz) or gigahertz (GHz). It is also known as Clock Rate.
- Word Length – it depends upon the width of internal data bus, registers, ALU, etc. An 8-bit microprocessor can process 8-bit data at a time. The word length ranges from 4 bits to 64 bits depending upon the type of the microcomputer.
- Data Types – the microprocessor has multiple data type formats like binary, BCD, ASCII, signed and unsigned numbers.

Features of a Microprocessor. Here is a list of some of the most prominent features of any microprocessor:

- Cost-effective – the microprocessor chips are available at low prices and results its low cost.
- Size – the microprocessor is of small size chip, hence is portable.
- Low Power Consumption – microprocessors are manufactured by using metaloxide semiconductor technology, which has low power consumption.
- Versatility – the microprocessors are versatile as we can use the same chip in a number of applications by configuring the software program.
- Reliability – the failure rate of an IC in microprocessors is very low, hence it is reliable.

**Exercise 2.** Match the words and their definitions.

portable	dimension, proportion or amount of something
decode	something that can be easily carried or moved
to fetch	number of bits processed in a single instruction
versatility	mini-computer
memory	available at low prices
bandwidth	to elicit
cost-effective	part of a computer where information is stored
size	using the same chip in many applications
microprocessor	receive an electronic signal and change it into another form

**Exercise 3.** Translate the following sentences using the key words from the vocabulary above.

1. The main part of a microprocessor is a control unit.
2. Upgrade to a higher bandwidth to increase your download limits.
3. I was involved in decoding enemy documents.
4. The management tries to produce the magazine as cost-effectively as possible.
5. She is a designer of extraordinary versatility.

## Grammar: ord building. Prefixes

We can form new words by using prefixes and suffixes, e.g. micro-process-or prefix + root+ suffix Prefixes come before the root word and usually change its meaning. Here are some common ones in IT (table 1).

Study the «Prefixes of location».

Table 1

Prefix	Meaning	Examples
trans-	= across	transmission, transfer
inter-	= between	interconnected, interactive
intra-	= within	intranet
extra-	= beyond = outside = in addition to	extramemory, extranet
tele-	= over a distance	teleconferencing, teleworking

**Exercise 4.** Use the words from the table ‘Prefixes of location’ to complete these sentences and make any necessary changes.

1. Data \_\_\_ can be wired or wireless.
2. An \_\_\_ is a private network restricted to a company’s internal use.
3. The Internet consists of millions of computers \_\_\_ in a global network.
4. \_\_\_ enables users in different places to talk to and see each other.
5. \_\_\_ (e.g. ROM or flash memory) is able to hold data when switched off.
6. \_\_\_ is increasing, so more and more people have an office at home and aren’t commuting to an office.
7. \_\_\_ is a network that allows communication between a company and the customers it deals with.

## Unit 6. Operating Systems

### Vocabulary

central processing unit - центральное процессорное устройство

memory management – управление памятью

enhanced software - улучшенное программное обеспечение

a graphical user interface - графический пользовательский интерфейс

user-friendly - удобный для пользователя

drop-down menu – раскрывающееся меню

task bar – панель задач

to preload - предварительно загружать

incompatible – несовместимый

embedded and loaded – встроенный и загружаемый



**Exercise 1.** Read and translate the text.

## **Operating Systems**

An operating system (OS) is the most important software that functions on a computer. It manages all the software and hardware on the computer. There are lots of different computer programs running at the same time, and they all need to access your computer's central processing unit (CPU), memory, and storage. The operating system coordinates all these processes to make sure each program gets what it needs. Therefore, the core functions of operating systems are the following: starting and shutting down a computer, providing a user interface, program management, memory management, utilities provision, task co-ordination, devices configuration and many more.

The OS that computer runs is sometimes called the platform. There are three most common platforms for personal computers, such as Microsoft Windows, Apple Mac and Linux. Actually, the choice between an Apple and Windows system is usually a matter of personal preference and trend. Both of the operating systems have developed enhanced software being regularly upgraded.

Modern operating systems use a graphical user interface (GUI). A GUI contains graphics, text and icons navigated by a computer mouse. This type of interface is user-friendly, where a user gets access to system functions by selecting program icons as well as other items from drop -down menus and the task bar. Each operating system's GUI has a different look and feel, so if you switch to a different operating system it may seem unfamiliar at first.

Windows operating system was created by Microsoft in the mid-1980s. Over the years, there have been different versions of Windows, but the most recent one is Windows 10 (released in 2015). It is considered as the most popular operating system in the world as it is easy to use, offers a wide variety of programs, updated drivers and games.

If we look into Mac OS it is a line of operating systems created by Apple. It comes preloaded on all new Macintosh computers, or Macs. According to the statistics as of 2020, Mac OS X users account for almost 53% of the operating systems market whereas the percentage of Windows users is almost 78%. Apple computers tend to be a lot more expensive and do not run the software incompatible with Mac OS. Still, many people prefer the look and feel of Mac OS X, because it is less prone to viruses, has a more appealing and simple interface than Windows.

Linux, created in 1991, is the only open-source operating system. So, any user may modify and distribute it. The advantages of Linux are that it is free, more secure and reliable than Windows and can be easily co-installed and switched to in any computer any time. Besides, there are many different versions you can choose from such as Ubuntu, Mint, and Fedora. Linux users account for less than 30%, because Windows has a wider selection of software utilities.

Thus, an operating system plays a major role in coordinating and controlling every application in a computer system. There are two types of all the applications

at any computer: embedded and loaded ones. In fact, the former come automatically with the loaded OS like Internet Explorer, Windows Media Player, Firewall (security-edge gateway), whereas the latter are added to a computer by the user as optional for specific needs. Various Internet browsers, anti-virus programs, and many other applications are installed by users themselves.

**Exercise 2.** Answer the questions:

1. Which operating system do you use? Are you glad with it? Why or Why not?
2. What is an operating system?
3. What are the essential functions of the operating system?
4. What is the other name for OS? What kind of operating systems are mentioned in the text?
5. What does graphical user interface contain?
6. Is a graphical user interface of various operating systems similar or different?
7. When was Windows created? Which company developed this OS?
8. Why is Windows the most popular OS?
9. Which OS was created by Apple?
10. Why most people try to prefer Mac OS X?
11. What are the good points of Linux?
12. What is the difference between embedded and loaded applications in a computer system?

**Exercise 3.** Fill in the gaps in the following sentences using the suggested words.

Platform, manages, enhanced, storage, Windows 10, applications, open-source, graphical user interface, 78%, operating systems, modify,

1. An operating system \_\_\_\_\_ all the software and hardware on the computer.
2. Different computer programs should access computer's central processing unit, memory, and \_\_\_\_\_.
3. Sometimes OS is called as \_\_\_\_\_.
4. Apple and Windows developed \_\_\_\_\_ software being regularly upgraded.
5. Modern operating systems use a \_\_\_\_\_.
6. The most recent version of Microsoft's OS is \_\_\_\_\_.
7. Windows market share is \_\_\_\_\_.
8. Linux is the only \_\_\_\_\_ operating system and any user may \_\_\_\_\_ and distribute it.
9. Windows and Mac are the most popular \_\_\_\_\_.
10. All the \_\_\_\_\_ a computer runs are of two types: embedded and loaded ones.

**Exercise 4.** Mark the sentences as true or false.

1. The operating system controls all the software and hardware on the computer.
2. The additional functions of operating systems are the following: starting and shutting down a computer, providing a user interface, program management etc.
3. It's impossible to update and change the operating system.
4. Windows XP is the latest Windows version.
5. According to the statistics, Mac OS X users make almost 72% of the operating systems market.
6. Linux users account for less than 30%.
7. There are two types of all the applications at any computer: embedded and loaded ones.

**Exercise 5.** Translate the following sentences into English.

Операционная система является основой программного обеспечения ПК. Операционная система представляет комплекс системных и служебных программных средств, который обеспечивает взаимодействие пользователя с компьютером и выполнение всех других программ. Одним из важнейших признаков классификации ЭВМ является разделение их на локальные и сетевые. Локальные ОС применяются на автономных ПК или компьютерах, которые используются в компьютерных сетях в качестве клиента. Андроид - операционная система, основана на ядре Linux, предназначена для смартфонов, планшетов, электронных книг, цифровых проигрывателей, наручных часов, фитнес-браслетов, игровых приставок, ноутбуков, нетбуков. В большинстве вычислительных систем операционная система является основной, наиболее важной (а иногда и единственной) частью системного программного обеспечения.

## **Unit 7. Programming Languages**

**Exercise 1.** Read and translate the text.

### **Programming Languages**

Programming is an important engineering tool. It is a procedure of writing a computer program with the help of a computer language. Computer programs are collections of instructions that inform a computer how to interact with the user and the computer hardware and how to process data. Usually a specialist chooses one who studies at a level close to ideal, or seeks to master it thoroughly in the future. For example, a programmer has chosen a general-purpose language, for example, C, Python, Lisp, PHP, etc. Then he needs at least one more technology, which is more narrowly focused one.

Programming languages are similar to each other, so the more you know them, the easier it is to learn new ones. However, the goal is why do you master it? The programming language must be used in practice, otherwise knowledge will

quickly be forgotten. The process of learning new things sometimes helps to better understand other technologies. Let's list the most important technologies for developing web applications:

HTML (hypertext markup language) is the basis of all pages on the Internet. Often, it is with him that beginners begin to study programming. Even if you are not engaged in front-end development, it is necessary to know the basics of hypertext markup language.

CSS (cascading style sheets) - together with HTML, is required for any kind of web development.

JavaScript takes the first place in the creation of an interactive frontend part of sites. The community of the language is so large that they began to use it in other areas.

SQL (structured query language) is required to create relational databases.

Python / Ruby - a web developer needs at least one dynamic language. JavaScript is also suitable, but only "clean" at the beginning of learning, and not using frameworks. In addition, Python is a universal language with which you can not only create backend applications, but also process data, design neural networks. Ruby has been less popular lately, but you can implement elegant solutions to many problems with it.

PHP (hypertext preprocessor) - a lot of Russian and foreign projects have been done on it. He is loved for his speed and relatively low entry threshold. Often when people say "backend" they mean "PHP".

Here are some more languages that experienced software engineers recommend for learning:

Java is the backbone.

C ++ / C - it is necessary to study this programming language in order to understand how things work in programming.

F # / Scala / Haskell / are to be studied not immediately, but after gaining some knowledge since they are difficult to learn.

Swift / Kotlin are necessary for working with mobile applications.

Markdown is a markup language that can be used to write text; it can be conveniently converted to other formats (HTML, etc.)

A novice developer of a programmer should first of all master HTML, CSS and even JavaScript.

**Exercise 2.** Make up 7 questions about the text and let your partner answer them, then change parts.

**Exercise 3.** Match the words having a similar meaning.

- |               |                       |
|---------------|-----------------------|
| 1 to perform  | A to learn thoroughly |
| 2 immediately | B prime, main         |
| 3 novice      | C to calculate        |
| 4 huge        | D unexperienced       |
| 5 to create   | E tremendous          |

6 important  
7 to master  
8 to compute  
9 goal  
10 dynamic

F at once  
G to execute  
H aim, target  
I energetic, active  
J to produce, to construct

**Exercise 4.** Match the sentence halves to form complete sentences.

1. Programming languages are similar to each other, so the more
  2. Computer programs are collections of
  3. The process of learning new things sometimes helps
  4. HTML is the basis of
  5. Structured query language is required
  6. A lot of Russian and foreign projects have been done
  7. Markdown is a markup language that
- A to better understand other technologies.  
B can be used to write text  
C you know them, the easier it is to learn new ones.  
D all pages on the Internet.  
E on PHP.  
F to create relational databases.  
G instructions that inform a computer how to interact with the user

### **Grammar. Participle I (Present Participle)**

English verbs have two participles: the present participle (typing, writing) and the past participle (typed, written). The Present participle (Participle 1) is formed by adding “ing” to the base form of the verb: flying, playing, running, sleeping, working. The present participle expresses active meaning: doing, flying, playing, reading, running, sleeping, taking, typing, working, writing.

**Exercise 5.** Translate the sentences paying attention to the Participle I.

1. The construction of power plants operating on atomic fuel and generating electric current is necessary.
2. The man shouting at the policeman seems familiar.
3. Sitting in the shade, we ate cake and drank coffee.
4. We broke the computer belonging to my father.
5. Don't wake the baby sleeping in the next room.
6. Working at his new invention, the scientist made numerous experiments.
7. In future the nuclear reactor must become one of the most reliable “furnaces” producing atomic energy.
8. Searching for her gloves, she dug through the entire wardrobe.
9. Look at the man crossing the street.
10. Water falling from the height changes potential energy into kinetic energy.

## Unit 8. Networks

### Vocabulary

to share resources – совместно использовать (поделиться) ресурсами

Local Area Networks – локальная сеть

Wide Area Networks – глобальная сеть

peer-to-peer – одноранговая сеть

Ethernet – локальная компьютерная сеть

a router - маршрутизатор

to forward data packets – пересылать пакеты данных

hotspot - беспроводная точка доступа

bus, star and ring - шина, звезда и кольцо

in a closed loop configuration - по замкнутому контуру

to redistribute the data – перераспределять данные

each arrangement – каждая схема

backbones – магистраль

### Exercise 1. Read and translate the text

#### Networks

A network is a number of computers connected together to allow them to share resources. Networked computers can share hardware, software and data. Most computer networks have at least one server. It is a powerful computer that provides one or more services to a network and its users, for example, file storage and e-mail.

There are two main types of network: Local Area Networks (LANs) and Wide Area Networks (WANs). A LAN is a network of computers within a department, an office, or a building. They can be built with two main types of architecture: peer-to-peer (P2P), where each computer stores files and acts as a server, or client-server, where one computer acts as a server containing the main hard disk and controlling the other PCs.

Computers in a LAN need to use the same protocol, or standard of communication. Ethernet is one of the most common protocols for LANs. A router, a device that forwards data packets, is needed to form a LAN by connecting the devices within a building or to link a LAN to another network. Connections between computers on a network can be wired or wireless. Most networks are linked with cables or wires but Wi-Fi technologies allow creating Wireless LANs which use radio signals to send data across networks. The absence of physical wires makes this kind of network very flexible. Hotspots are WLANs available for public use in places like air-ports and hotels, but sometimes the service is also available outdoors.

There are different ways of setting up a LAN. Three of the main topologies include bus, star and ring. In a bus network, all workstations, servers and printers

are joined to one cable – “the bus”. In a ring network, all devices are connected to one another in a closed loop configuration. Each data packet on the network travels in one direction. In a star network, each device has its own cable that connects to a hub, a connection point of the elements of a network that redistributes the data. Most networks use a mixture of topologies since each arrangement has its own advantages and disadvantages.

A WAN covers a large geographical area. Most WANs are made from several LANs connected together. They are usually linked through telephone lines, fibre-optic cables or satellites. The main transmission paths within a WAN are high-speed lines called backbones. The largest WAN is the Internet.

**Exercise 2.** Answer the questions:

1. What is a network?
2. What is a server in a computer network?
3. What are two main types of a network?
4. What are two types of architecture in a network?
5. Talk about connections between computers
6. What are the most common network topologies?
7. How are most of WANs connected?

**Exercise 3.** Choose the best definition for each word.

1. router

A a part of a computer

B a wireless network

C a networking device

2. LAN

A a local network

B a wired network

C a computer

3. to connect

A to disrupt

B to join something to another piece of equipment

C to arrive

4. WAN

A Windows Application Network

B Wide Area Network

C with account number

5. hotspot

A an area of activity

B beautiful view in the airport

C a place with wireless internet





to spur - подстёгивать, инициировать ускорение  
disseminated - рассредоточенный  
ultimately – в конечном счете, в итоге  
impetus – стимул, толчок  
the World Wide Web Consortium - консорциум всемирной паутины

**Exercise 1.** Read and translate the text

## History of Internet

The Internet started in the 1960s as a way for government researchers to share information. Computers in the 1960s were large and immobile and in order to make use of information stored in any one computer, one had to either travel to the site of the computer or have magnetic computer tapes sent through the conventional postal system.

Another catalyst in the formation of the Internet was the heating up of the Cold War. The Soviet Union's launch of the Sputnik satellite spurred the U.S. Defense Department to consider ways information could still be disseminated even after a nuclear attack. This eventually led to the formation of the ARPANET (Advanced Research Projects Agency Network), the network that ultimately evolved into what we now know as the Internet. ARPANET was a great success but membership was limited to certain academic and research organizations who had contracts with the Defense Department. In response to this, other networks were created to provide information sharing.

January 1, 1983 is considered the official birthday of the Internet. Prior to this, the various computer networks did not have a standard way to communicate with each other. A new communications protocol was established called Transfer Control Protocol/Internetwork Protocol (TCP/IP). This allowed different kinds of computers on different networks to “talk” to each other. ARPANET and the Defense Data Network officially changed to the TCP/IP standard on January 1, 1983, hence the birth of the Internet. All networks could now be connected by a universal language.

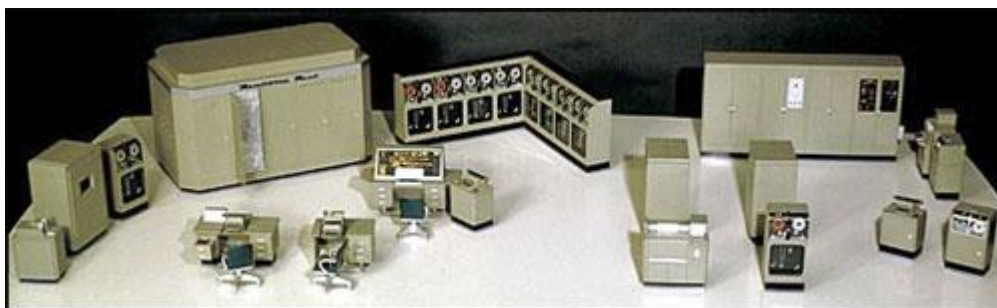


Figure 2

The image above is a scale model of the UNIVAC I (the name stood for Universal Automatic Computer) which was delivered to the Census Bureau in 1951. It weighed some 16,000 pounds, used 5,000 vacuum tubes, and could perform about 1,000 calculations per second. It was the first American commercial computer, as well as the first computer designed for business use.

The first program for the exchange of e-mails on the Global Network appeared in 1971 and immediately became in demand among Internet users. In 1984, a computerized domain name distribution system began to function, which allows information to be obtained in the area of a website on the Web. In addition, in 1984 another large-scale network, NSFNet appeared, which was created by the United States National Science Foundation.

However, the global network became the main provider of data only in 1995, when its traffic exceeded the volume of transmitted information, the popular file transfer protocol FTP. This was the impetus for the creation of the W3C - the World Wide Web Consortium. It is worth noting that it was the latter that gave the appearance of the previously faceless Internet. Thus, since 1996, the terms "Internet" and "World Wide Web" almost completely replace each other.

**Exercise 2.** Complete the sentences with the words: commercial computer, sputnik satellite, communications protocol, a computerized domain name, immobile.

1. Computers in the 1960s were large and \_\_\_\_\_.
2. The Soviet Union's launch of the \_\_\_\_\_ spurred the U.S. Defense Department to form ARPANET.
3. A new \_\_\_\_\_ was established called Transfer Control Protocol/Internetwork Protocol.
4. It was the first American \_\_\_\_\_, as well as the first computer designed for business use.
5. In 1984, \_\_\_\_\_ distribution system began to function.

**Exercise 3.** Answer the questions:

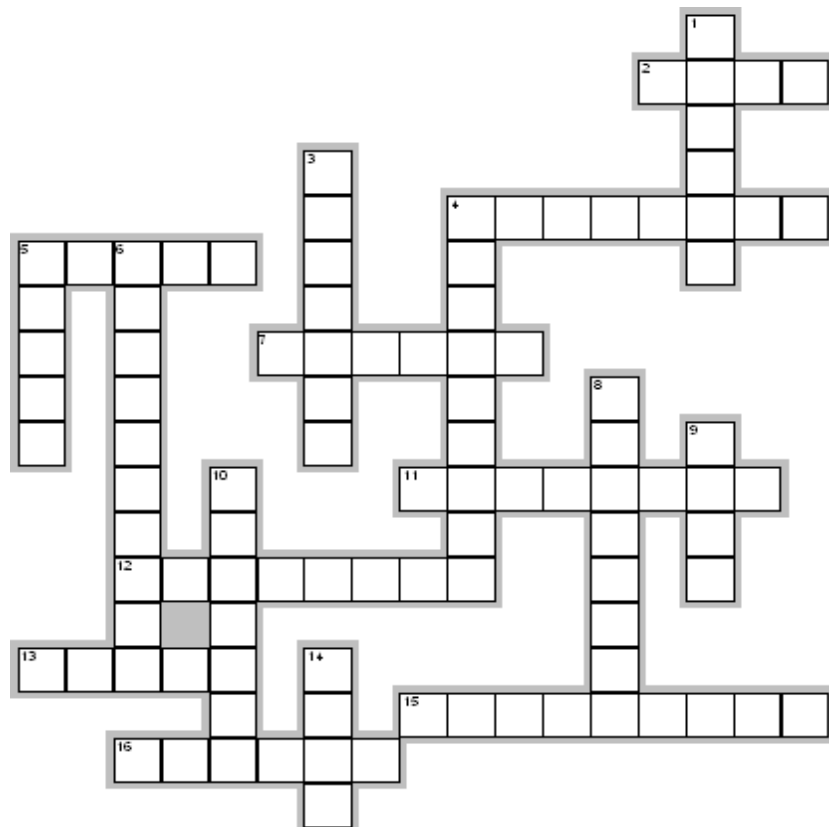
1. How did the Internet start in 1960s?
2. Why was it necessary to travel to the site of the computer or have magnetic computer tapes?
3. Why was the ARPANET formed?
4. What was the result of establishing Transfer Control Protocol/Internetwork Protocol?
5. When did the first program for the exchange of e-mails appear?
6. What was the impulse for creating the World Wide Web Consortium?

**Exercise 3.** Decide whether the sentences true or false.

1. At the initial stage of the development the computers were small and portable.

2. Another catalyst in the formation of the Internet was the heating up of the World War II.
3. January 1, 1983 is considered the official birthday of the Internet.
4. UNIVAC I was the first American commercial computer, as well as the first computer designed for business use.
5. The global network became the main provider of data only in 1997.

### Crossword – INTERNET



#### Across

2. Junk e-mail sent to many people at once, usually involving advertising or offering services. (4)
4. Pieces of equipment, such as the computer, keyboard, webcam etc. (8)
5. When your computer suddenly stops working. (5)
7. A computer expert who can break through security to damage computers with viruses or steal data. (6)
11. A program which protects your computer from damage by other users. (8)
12. A way of marking an internet website so that you can find it easily. (8)
13. A piece of software that is on your computer without your permission and runs against your wishes. (5)
15. A permanent high-speed internet connection. (9)
16. This thing on your screen can indicate two things: 1) where your mouse pointer is, or 2) where the next character typed will be entered in a line of

text. (6)

### **Down**

1. To move a file from your computer onto the internet. (6)
3. To replace something with a newer version. (7)
4. A word, phrase, or image that you can click on to move to a new document or a new section within the current document. (9)
5. To push one of the buttons on the mouse. (5)
6. The area where you type the address of the web site you want to view.
8. To move a file from the internet to your computer. (8)
9. An online personal diary with thoughts and opinions as well as links to other websites. (4)
10. A program you use to view websites. (7)
14. A small picture on the screen that shows the type of file or program. (4)

## **Unit 10. Internet Security**

### **Vocabulary**

malicious software (malware) - вредоносные программы

spyware - шпионское ПО

to replicate – воспроизводиться

to pretend to be a trusted file - выдавать себя за надежный файл

to disguise - замаскироваться

scam- мошенничество

scareware - паника

to verify - подтвердить

firewall – брандмауэр, межсетевой защитный экран

backup copy – резервная копия

**Exercise 1.** Read and translate the text

### **Internet Security**

The online world is an amazing place but, like real world, there are some risks. There are a number of malicious software (malware) programs that can cause damage to computers or collect information without your knowledge. These include viruses, worms, Trojans, spyware and other malware. Malware is often downloaded from spam emails or websites that are not properly protected. A secure website usually starts with https:// where the 's' stands for a secure web server.

Some malware is designed to copy itself and spread to other connected computers. This type of malware is known as a virus. In computers, the virus spreads by infecting files on a shared space like a network file system or by email, downloaded from the Internet or from removable medium like a USB stick, CD or DVD.

Computer worms are similar self-replicating programs, except they can spread without human help. There are other harmful computer programs that can be part of a virus, but they do not have the ability to replicate. For example, spyware. This type of malware spies on users' activities, usually to steal financial details or passwords.

A Trojan is a type of malicious program that pretends to be a trusted file. A Trojan pretends to be something interesting and harmless, such as a game, but when it runs, it may have harmful effects.

Malicious links disguised as security warnings have become a popular tactic with cybercriminals. These official-looking notices warn you that your computer has a virus and try to scare you into clicking the link or download a program to fix it, but in reality the link leads to malware. The word for this type of scam is scareware.

Viruses and other malware are often included in spam. It is another term for unwanted email advertisements. Many spam emails aren't trying to sell you something – they're trying to steal your money or personal information, like phishing emails. Phishing is a type of scam in which an email pretends to be from a bank or from a social networking site to trick you into giving out personal information. For example, a phishing email may claim that “unauthorized charges” were made on your credit card and that you need to immediately verify your information. The details are then used to steal people's money, or steal their identity in order to commit crimes.

The best defense against Internet threats is good antivirus software. It checks all the files that come in and out of your computer. If it finds malware, it safely removes it. To remain effective, antivirus software must be regularly updated. Another important part of protecting your computer is using a 'firewall'. A firewall checks which websites and malware are trying to access your computer and helps prevent any unauthorized access. Most operating systems have built-in firewalls, however, make sure they are turned on.

There are a few other things you can do to protect yourself when you are online:

- Don't open any attachment you weren't expecting.
- Make backup copies of your files regularly.
- Use strong passwords for all your Internet accounts.
- Avoid using public Wi-Fi for shopping and banking to keep your payment details safe.

**Exercise 2.** Answer the questions:

1. What types of malware programs are mentioned in the text?
2. Where is malware mainly downloaded from?
3. What is a virus?
4. What is spyware?
5. What is the aim of phishing?
6. What can remove malware from a computer?

7. How can people protect themselves against fishing?
8. What's the purpose of the firewall?
9. What is the best defense against Internet threats?
10. How can one protect himself while being online?

**Exercise 3.** Complete the sentences with the words: disguised, virus, trusted, spam, worms, firewall, strong passwords, pretends, malware, antivirus software.

1. \_\_\_\_ is often downloaded from spam emails or websites that are not properly protected.
2. \_\_\_\_ copy itself and spread to other connected computers.
3. \_\_\_\_ are self-replicating programs and they can spread without human help.
4. A Trojan is a type of malicious program that pretends to be a \_\_\_\_ file.
5. Evil-intentioned links \_\_\_\_ as security warnings have become a popular tactic.
6. Viruses and other malware are often included in \_\_\_\_.
7. Fishing email \_\_\_\_ to be from a bank or from a social networking site.
8. The most effective defense against Internet threats is good \_\_\_\_.
9. One more important part of protecting your computer is using a \_\_\_\_.
10. It is necessary to use \_\_\_\_ for all Internet accounts.

**Exercise 4.** Match the words and their definitions

Table 2

Internet	unwanted advertising material sent by email
virus	software that gives a secret information about someone or his computer activities without his knowledge
spam	to get data from computer, usually using the internet
threat	picture or film telling people about a product, job or service
spyware	international computer network connecting other networks and computers
advertisement	malware copying itself and spreading to other computers
download	the possibility of trouble, danger or disaster

**Exercise 4.** Make up sentences of your own with the words from the Vocabulary.

**Grammar. Infinitive.** Infinitive is non-finite form of a verb such as *be* or *run*. In English, an infinitive is used by itself, for example *swim* in *She can swim* (this use is sometimes called the bare infinitive), or with *to* (the to-infinitive) as in *She likes to swim*.

**Exercise 5.** Translate the following sentences paying attention to the infinitive.

1. Windows allows you to display two different folders at the same time
2. He is supposed to be writing a report now.
3. He is known to have been working in this field for many years.
4. This report might have been written by one of our freelance workers.
5. Adding more memory lets your computer to work faster.
6. She seems to like her job.
7. She doesn't like to be disturbed during her work.
8. She reminded him to buy cheese.
9. ALT+TAB allows you to switch between the programs.
10. She found him to be a very nice person.
11. Caps Lock key allows you to type in upper case.
12. She helped me to wash the windows.
13. The doctor advised him to rest for a few days.
14. To open a menu, click on its name in the menu bar.
15. To take master's course, you need to pass IELTS exam.

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## Contents

Introduction .....	3
Unit 1. Personal Computer .....	4
Unit 2. What is a Software Engineer.....	6
Unit 3. Input Devices .....	9
Unit 4. Output Devices.....	12
Unit 5. How does a Microprocessor Work?.....	14
Unit 6. Operating Systems .....	17
Unit 7. Programming Languages .....	20
Unit 8. Networks .....	23
Unit 9. History of Internet .....	26
Unit 10. Internet Security .....	29
List of literature .....	32



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