

**Некоммерческое  
акционерное  
общество**



**АЛМАТИНСКИЙ  
УНИВЕРСИТЕТ  
ЭНЕРГЕТИКИ И**

**Кафедра  
иностранных  
языков**

## **АНГЛИЙСКИЙ ЯЗЫК**

**Practical English for special purposes for students  
in Computer science**

**Методические указания для специальности**

**5В070400 - Вычислительная техника и программное обеспечение**

Алматы, 2013

СОСТАВИТЕЛЬ: С.Б. Бухина. Practical English for special purposes for students in Computer Science. Методические указания для специальности 5В070400 – Вычислительная техника и программное обеспечение – Алматы: АУЭС, 2013. – 45 с.

Данные методические указания предназначены для развития умений чтения и перевода технических текстов в области вычислительной техники и программного обеспечения.

Методические указания включают в себя аутентичный текстовый материал технического характера с упражнениями и заданиями для усвоения лексико-грамматических конструкций и терминов по данной специальности. Содержательная сторона методических указаний современна, актуальна и соответствует тематике изучаемой дисциплины.

Материал может найти применение, как на аудиторных занятиях, так и в практике самостоятельной работы с целью формирования иноязычной профессиональной компетенции студентов – бакалавров специальности 5В070400.

Рецензенты: кандидат филологических наук, доцент В.С. Козлов;  
старший преподаватель Л.Я. Коробейникова

Печатается по плану издания некоммерческого акционерного общества «Алматинский университет энергетики и связи» на 2013 г.

© НАО «Алматинский университет энергетики и связи», на 2013г.  
**UNIT 1. Personal computer**

**Texts:** Personal computer; Personal computer types.

1. *Memorize the words*

chassis – шасси; рама; ходовая часть

to pin down – зд. применяться; подходить

general purpose – универсальный; общего назначения

slot – гнездо; разъем

expansion slot – разъем для модуля расширения

spreadsheet – печатный лист

to enter the fray – зд. появиться

onslaught – бешеная атака, нападение

to survive onslaught – выдержать конкуренцию

plug – штепсель; вилка; штекер; подключать; подсоединять

aside from – помимо; за исключением (*амер.*)

handwriting recognition – распознавание почерка

thereafter – после этого; впоследствии; соответственно

price tag – ярлык (с указанием цены)

compatible – совместимый

to fade – зд. исчезать

word processing – редактирование текстов

2. *Read the text and speak about personal computer types:*

### **Personal Computer**

It can be defined as a small, relatively inexpensive computer designed for an individual user. In price, personal computers range anywhere from a few hundred pounds to over five thousand pounds. All are based on the microprocessor technology that enables manufacturers to put an entire CPU on one chip. Businesses use personal computers for word processing, accounting, desktop publishing, and for running spreadsheet and database management applications. At home, the most popular use for personal computers is for playing games and recently for surfing the Internet.

Personal computers first appeared in the late 1970s. One of the first and most popular personal computers was the Apple II, introduced in 1977 by Apple Computer. During the late 1970s and early 1980s, new models and competing operating systems seemed to appear daily. Then, in 1981, IBM entered the fray with its first personal computer, known as the IBM PC. The IBM PC quickly became the personal computer of choice, and most other personal computer manufacturers fell by the wayside. P.C. is short for personal computer or IBM PC. One of the few companies to survive IBM's onslaught was Apple Computer, which remains a major player in the personal computer marketplace. Other companies adjusted to IBM's dominance by building IBM clones, computers that were internally almost the same as the IBM PC, but that cost less. Because IBM clones used the same

microprocessors as IBM PCs, they were capable of running the same software. Over the years, IBM has lost much of its influence in directing the evolution of PCs. Therefore after the release of the first PC by IBM the term PC increasingly came to mean IBM or IBM-compatible personal computers, to the exclusion of other types of personal computers, such as Macintoshes. In recent years, the term PC has become more and more difficult to pin down. In general, though, it applies to any personal computer based on an Intel microprocessor, or on an Intel-compatible microprocessor. For nearly every other component, including the operating system, there are several options, all of which fall under the rubric of PC.

Today, the world of personal computers is basically divided between Apple Macintoshes and PCs. The principal characteristics of personal computers are that they are single-user systems and are based on microprocessors. However, although personal computers are designed as single-user systems, it is common to link them together to form a network. In terms of power, there is great variety. At the high end, the distinction between personal computers and workstations has faded. High-end models of the Macintosh and PC offer the same computing power and graphics capability as low-end workstations by Sun Microsystems, Hewlett-Packard, and DEC.

### **Personal Computer types**

Actual personal computers can be generally classified by size and chassis / case. The chassis or case is the metal frame that serves as the structural support for electronic components. Every computer system requires at least one chassis to house the circuit boards and wiring. The chassis also contains slots for expansion boards. If you want to insert more boards than there are slots, you will need an expansion chassis, which provides additional slots. There are two basic flavors of chassis designs—desktop models and tower models—but there are many variations on these two basic types. Then come the portable computers that are computers small enough to carry. Portable computers include notebook and subnotebook computers, hand-held computers, palmtops, and PDAs.

#### **Tower Model**

The term refers to a computer in which the power supply, motherboard, and mass storage devices are stacked on top of each other in a cabinet. This is in contrast to desktop models, in which these components are housed in a more compact box. The main advantage of tower models is that there are fewer space constraints, which makes installation of additional storage devices easier.

#### **Desktop Model**

A computer designed to fit comfortably on top of a desk, typically with the monitor sitting on top of the computer. Desktop model computers are broad and low, whereas tower model computers are narrow and tall. Because of their shape, desktop model computers are generally limited to three internal mass storage

devices. Desktop models designed to be very small are sometimes referred to as slim line models.

### **Notebook Computer**

An extremely lightweight personal computer. Notebook computers typically weigh less than 6 pounds and are small enough to fit easily in a briefcase. Aside from size, the principal difference between a notebook computer and a personal computer is the display screen. Notebook computers use a variety of techniques, known as flat-panel technologies, to produce a lightweight and non-bulky display screen. The quality of notebook display screens varies considerably. In terms of computing power, modern notebook computers are nearly equivalent to personal computers. They have the same CPUs, memory capacity, and disk drives. However, all this power in a small package is expensive. Notebook computers cost about twice as much as equivalent regular-sized computers. Notebook computers come with battery packs that enable you to run them without plugging them in. However, the batteries need to be recharged every few hours.

### **Laptop Computer**

A portable computer is small enough that it can sit on your lap. Nowadays, laptop computers are more frequently called notebook computers.

### **Subnotebook Computer**

A portable computer that is slightly lighter and smaller than a full-sized notebook computer. Typically, subnotebook computers have a smaller keyboard and screen, but are otherwise equivalent to notebook computers.

### **Hand-Held Computer**

A portable computer that is small enough to be held in one's hand. Although extremely convenient to carry, handheld computers have not replaced notebook computers because of their small keyboards and screens. The most popular hand-held computers are those that are specifically designed to provide PIM (personal information manager) functions, such as a calendar and address book. Some manufacturers are trying to solve the small keyboard problem by replacing the keyboard with an electronic pen. However, these pen-based devices rely on handwriting recognition technologies, which are still in their infancy. Hand-held computers are also called PDAs, palmtops and pocket computers.

### **Palmtop**

A small computer that literally fits in your palm. Compared to full-size computers, palmtops are severely limited, but they are practical for certain functions such as phone books and calendars. Palmtops that use a pen rather than a keyboard for input are often called hand-held computers or PDAs. Because of their small size, most palmtop computers do not include disk drives. However, many contain PCMCIA slots in which you can insert disk drives, modems, memory, and other

devices. Palmtops are also called PDAs, hand-held computers and pocket computers.

### **PDA**

Short for **personal digital assistant**, a handheld device that combines computing, telephone/fax, and networking features. A typical PDA can function as a cellular phone, fax sender, and personal organizer. Unlike portable computers, most PDAs are pen-based, using a stylus rather than a keyboard for input. This means that they also incorporate handwriting recognition features. Some PDAs can also react to voice input by using voice recognition technologies. The field of PDA was pioneered by Apple Computer, which introduced the Newton Message Pad in 1993. Shortly thereafter, several other manufacturers offered similar products. To date, PDAs have had only modest success in the marketplace, due to their high price tags and limited applications. However, many experts believe that PDAs will eventually become common gadgets.

PDAs are also called palmtops, hand-held computers and pocket computers.

### **Wearable computer**

This computer runs on batteries and is worn on the user's body, e.g. on a belt, backpack or vest; it is designed for mobile or hands-free operation. Some devices are equipped with a wireless modem, a small keyboard and a screen; others are voice-activated and can access email or voice mail.

3. *Look through the texts and answer the questions:*

1) When did the first personal computers appear? 2) What do business use personal computers for? 3) How could companies (except Apple) survive IBM's onslaught? 4) What are the principal characteristics of personal computers? 5) What are the advantages of portable computers? 6) What are their drawbacks? 7) How many types of portable computers are there? 8) What differs personal computer from large computer systems?

4. *Which type of computer do these descriptions refer to:*

1) A typical computer found in many businesses and popular for home use;

2) A hand-held computer which can be used as a telephone, a web explorer and a personal organizer;

3) A small computer that fits into items of clothing;

4) A portable computer that can be closed up like a briefcase; but it can be as powerful as a desktop PC;

5) A full-function PC, though it only weighs 1.2 kg –you can go to a meeting and write your notes on it, like a paper notepad; its screen mode can be changed from portrait to landscape;

6) A large computer used for intensive data processing and often linked to many terminals.

5. *Look at the computer advertisement and find this information:*

**Toshiba Satellite**

- Intel Centrino processor
- 1,024 MB RAM, 100 GB hard disk drive
- DVD SuperMulti (+/-R double layer) drive
- 15.4'' widescreen TFT active-matrix LCD display
- 85-key keyboard and touchpad
- 2 memory slots, 1 PC Card or PCMCIA slot
- Wireless communications^ Wi-Fi compliancy and Bluetooth
- 4 USB ports for connecting peripherals: digital camera, MP3 player, modem, etc.
- 6-cell rechargeable Lithium-ion battery pack

1. What type of computer is advertised?
2. What kind of screen does it have?
3. Which pointing device replaces the mouse?
4. What type of ports does it have for connecting cameras and music players?
5. What sort of power supply does it use?

6. *Read this interview with Adam Hawkins, an IT manager, and complete it with words from the PDA text:*

*Interviewer:* What are the basic features of a PDA?

*Adam:* Well, a typical PDA is a (1).....device that runs on batteries combines computing, phone and Net capabilities.

*Interviewer:* And how do you enter information?

*Adam:* For input, you use a (2).....or pen to write and make selections on a (3).....; they also have buttons for launching programs. Some models have a small keyboard. They may have a (4).....system that reacts to the user's voice.

*Interviewer:* Do they need special software?

*Adam:* yes, most of them run on *Windows Mobile*. Palmtops supported by Palm Inc. use *Palm OS*. Pen-based systems include (5).....,so you write on the screen and the computer recognizes your handwriting and inserts the appropriate letters.

*Interviewer:* What sort of things can you do with a PDA?

*Adam:* You can store personal information, take notes, draw diagrams and make calculations. Many PDAs can access the Net via (6).....technology.

7. *Write down two benefits and two limitations of PDAs.*

8. *Explain in a paragraph how laptops can be beneficial to business people.*

9. *Write three examples of how tablet PCs can be used in the classroom.*

## UNIT 2. What is a Microcomputer?

**Texts:** What is a microcomputer? What is a computer? Applications of personal computers. A modem.

### 1. Memorize the words:

architecture – архитектура; структура

application – приложение; применение; (прикладная программа)

purpose – цель

circuit – электрическая цепь

to handle – обрабатывать; управлять; регулировать

versatility – многофункциональность; универсальность

rainstaking – старательный, усердный; тщательный

via – через

beep – сигнализировать

### 2. Read and translate the texts:

#### **What is a Microcomputer?**

A microcomputer is a digital electronic computer designed for use by single person. These were the first computers to have their CPU on a single microchip. They are also called personal computers because of their intended use for typical personal activities such as writing letters, browsing the web, playing games, balancing a checkbook, etc.

Note that the term PC comes from “Personal Computer,” but the term “PC” is commonly used to refer specifically to microcomputers that use a system architecture descended from the IBM Personal Computer. Therefore, even though an Apple Macintosh microcomputer is also a personal computer, most people would not refer to it as a “PC.”

#### **What is a Computer?**

The machine you think of as a “computer” is more precisely called a “general-purpose digital electronic computer.” It is general-purpose because it can be programmed to perform a wide variety of applications (making it different from a special-purpose computer designed to perform only one function). Digital means that computer handles all data internally in the form of *numbers* (all of the numeric data, all of the text data, and even sounds and pictures are stored as numbers). The word digit originally meant “finger” or “toe” and since people started counting on their fingers, the word digit also came to be applied to numbers. A different type of computer that represents values as voltage levels is called an *analog* computer, but you are unlikely to ever run into such a thing. Modern computers are all electronic because they manipulate data using electronic switching circuits (some older computing machines, or ideas for computers, were *mechanical*, using wheels, levers, etc. to perform calculations).

A computer is a device that performs four functions: it inputs data (getting information into the machine); it stores data (holding the information before and after processing); it processes data (performing prescribed mathematical and logical operations on the information at high speed); and it outputs data (sending the results out to the user via some display method).

A computer system consists of both hardware and software. The *hardware* is the physical equipment: the computer itself and the peripherals connected to it. The peripherals are any devices attached to the computer for purposes of input, output, and storage of data (such as a keyboard, monitor display, or external hard disk).

The *software* consists of the programs and associated data (information) stored in the computer. A program is a set of instructions that the computer follows to manipulate data. Being able to run different programs is the source of a computer's versatility. Without programs, a computer is just a lot of high-tech hardware that doesn't do anything. But with the detailed, step-by-step instructions of the program (painstakingly written by humans) the computer can be used for tasks ranging from word processing a letter to simulating global weather patterns. The computer appears to be so amazing simply because it can execute these sets of instruction *very fast*; but it's just following the program steps one by one in a very simple-minded manner.

As a user, you will interact with the programs running on your computer through the *input devices* connected to it, such as a mouse and a keyboard. You use these devices to provide input and also to give commands to the program. The computer program will provide output (the data resulting from the manipulations within the computer) via various *output devices* for presenting the information (such as a monitor, a printer, or a sound output system that beeps if the program needs your attention).

Personal computers are used in a very interactive manner, with the user continuously inputting data and commands (to choose various program functions), and monitoring the output displaying the results of the commanded operations.

3. *Look through the text and answer the questions:*

1) What is hardware? 2) Give the definition of software. 3) What is the difference between digital and analog computers? 4) Who prepares the instructions of the program? 5) How can we interact with the programs on our computers? 6) What are these devices? 7) What are the functions of output devices?

4. *Find out the Russian equivalents for the following word combinations:*

General purpose computer; high-tech hardware; a computer's versatility; painstakingly written by humans; performing prescribed mathematical and logical operations on the information; the numeric data; electronic switching circuits; a very simple-minded manner.

5. *Remember the meaning of the words and try to translate the combinations with these words:*

*Hardware:* computer hardware; device hardware; display hardware; memory hardware; mouse hardware; network hardware; system hardware; video hardware.

*Software:* application software; system software; database software; disk software; educational software; game software; management software; simulation software.

*Architecture:* computer architecture; communication architecture; disk architecture; microprocessor architecture; network architecture; security architecture; system architecture; virtual architecture.

*Protection:* data protection; computer protection; device protection; display protection; error protection; hardware protection; software protection; resource protection; security protection; virus protection; system protection.

*Procedure:* computational procedure; accounting procedure; control procedure; data-processing procedure; decision procedure; error-correcting procedure; formatting procedure; installation procedure; solution procedure; management procedure.

6. *Coordinate the words given in the left column with their interpretation in the right:*

- |                        |  |
|------------------------|--|
| 1) Analog computer     | a) a sequence of instructions enabling the computer to solve a given task;                             |
| 2) Digital computer    | b) a tiny piece of silicon containing complex electronic circuits used inside all computers;           |
| 3) Computer            | c) a combination of interconnected circuit elements produced in a chip to perform a definite function; |
| 4) Hardware            | d) a system which processes and stores great amount of data solving problems of numerical computation; |
| 5) Software            | e) a device which can carry out routine mental tasks by performing simple operations at high speed;    |
| 6) Transistor          | f) a small piece of a semiconductor that greatly reduced power consumption of a circuit;               |
| 7) Chip                | g) a device that has input and output represented in the form of physical quantities;                  |
| 8) Program             | h) electronic and mechanical equipment in a computer system;   |
| 9) Programming         | i) a set of programs, procedures and associated documentation;   |
| 10) Integrated circuit | j) the process of preparation a set of coded instructions for a computer.                              |

7. *Memorize the words:*

maintenance – поддержание; сохранение; эксплуатация  
to move paragraphs around – менять местами абзацы  
application software – прикладные программы  
accountant – бухгалтер  
accounting – бухгалтерский учет  
income tax – подоходный налог  
grading – оценивание; классификация  
stock market forecasting – биржевые прогнозы  
word processing – обработка текста  
telephone dialing – набор номера телефона  
appliance – устройство; прибор  
worksheet – электронная таблица  
scheduling – составление расписания, графика  
computer-assisted instructions – компьютерные программы  
to meet the demands – удовлетворять потребности  
record keeping – регистрация; ведение записей  
to delete – удалять; стирать; очищать память  
to give an impetus – стимулировать (что-л.)

8. *Read the text and say where personal computers are used:*

### **Application of personal computers**

Personal computers have a lot of applications; however, there are some major categories of applications: home and hobby, word processing, professional, educational, small business and engineering and scientific.

*Home and hobby.* Personal computers enjoy great popularity among experimenters and hobbyists. They are an exciting hobby. All hobbyists need not be engineers or programmers. There are many games that use the full capabilities of a computer to provide many hours of exciting leisure-time adventure.

The list of other home and hobby applications of PCs is almost endless, including: checking account management, budgeting, personal finance, planning, investment analyses, telephone answering and dialing, home security, home environment and climate control, appliance control, calendar management, maintenance of address and mailing lists and what not.

*Word processing.* At home or at work, applications software, called a word processing program, enables you to correct or modify any document in any manner you wish before printing it. Using the CRT monitor as a display screen, you are able to view what you have typed to correct mistakes in spelling or grammar, add or delete sentences, move paragraphs around, and replace words. The letter or document can be stored on a disk for future use.

*Professional.* The category of professional includes persons making extensive use of word processing, whose occupations are particularly suited to the desk-top use of PCs. Examples of other occupations are accountants, financial advisors, stock

brokers, tax consultants, lawyers, architects, engineers, educators and all levels of managers. Applications programs that are popular with persons in these occupations include accounting, income tax preparation, statistical analysis, graphics, stock market forecasting and computer modeling program most widely used by professionals. It can be used for scheduling, planning, and the examination of “what if” situations.

*Educational.* Personal computers are having and will continue to have a profound influence upon the classroom, affecting both the learner and the teacher. Microcomputers are making their way into classrooms to an ever-increasing extent, giving an impetus to the design of programmed learning materials that can meet the demands of student and teacher.

Two important types of uses for personal computers in education are computer-managed instruction (CMI), and computer-assisted instruction (CAI). CMI software is used to assist the instructor in the management of all classroom-related activities, such as record keeping, work assignments, testing, and grading. Applications of CAI include mathematics, reading, typing, computer literacy, programming languages, and simulations of real-world situations.

9. *Look through the text and answer the questions:*

1) What are the main fields of PC application? 2) Is it necessary for a person to be an analyst or a programmer to use a computer? 3) What other home and hobby applications, except computer games, can you name? 4) What is “a word processing program”? 5) What possibilities can it give us? 6) Can you correct mistakes while typing any material and how? 7) What other changes in the typed text can you make using a display? 8) How can computers be used in education? 9) Which professions are in great need of computers?

10. *Find out the English equivalents for the following word combinations:*

Бесконечный перечень; ведение календаря; анализ инвестиций; способности компьютера; набор номера телефона; подоходный налог; бухгалтерский учет; компьютерное моделирование; автоответчик; моделирование реально-жизненных ситуаций; электронные таблицы; прокладывать путь; хранение адресов и почты; консультант по налогам; переставлять абзацы; составление расписания; оказывать огромное влияние; и так далее; биржевые брокеры; исправлять ошибки в написании; стирать предложения; работники образования; много областей применения; бесконечный перечень; способности компьютера; дать толчок; учебная деятельность; биржевые брокеры; тем не менее, анализ инвестиций; прикладные программы.

11. *Translate the groups of words:*

Give an impetus; to have a profound influence; tax consultants; to meet the demands; mistakes in spelling; to move paragraphs around; word processing; to

affect both the learner and the teacher; computer-managed instruction; computer-assisted instruction.

12. *Read the text and write a summary in English:*

### **A modem**

The piece of equipment that allows a computer to communicate with other computers over telephone lines is called a modem. The modem allows the individual to access information from all over the world and use that information in everyday life. Connecting with banks, Automatic Teller Machines, cash registers to read credit cards, access travel agents, buy products, e-mail, access databases, and teleconferencing, the modems provide easy access to many services. Files can be transferred easily, by uploading to another machine, or downloading to your own machine within a matter of minutes. The computer modem can be used as a telephone answering system, and documents can be used faxed from one computer to another assuring fast and easy access to important documents.

A modem takes computer information and changes it into a signal that can be sent over telephone lines. The modem is a bridge between digital and analog signals. The computer is of the digital type, and the telephone using analog technology. The modem converts the “0”s and “1”s of the computer (off-on switches) into an analog signals modulating the frequency of the electronic wave or signal. The modem does just the opposite and demodulates the signal back into digital code. The modem gets its name from MODulate and DEModulate.

Most people believe that you need a separate phone line for a modem, but that is not true. You modem and telephone can share one line, the problem arises when someone else needs to use the telephone while the modem is in use. Also disable call waiting could disrupt your modem connection while the modem is in use.

There are three kinds of modems – internal, external, and fax. All modems do the same thing: they allow computers to communicate through telephone lines. This lets computers exchange information everywhere. *Internal Modem* is a circuit board that plugs into one of the expansion slots of the computer. Internal modems usually are cheaper than external modems, but when problems occur, fixing and troubleshooting the modem can sometimes prove to be quite difficult. *External Modem* attaches to the back of the computer by way of a cable that plugs into the modem port. It is usually less expensive and very portable. It can be used with other computers very easily by unplugging it and plugging it into another computer. *Fax Modem* can be hooked up to your telephone and used to send information to your computer. Your computer can also send information to a fax machine. Most computer modems are modems with faxing capabilities.

13. *Translate the texts into English*

1) *Модём* (акроним, составленный из слов модулятор и демодулятор)— устройство, применяющееся в системах связи для физического сопряжения

информационного сигнала со средой его распространения, где он не может существовать без адаптации.

Модулятор в модеме осуществляет модуляцию несущего сигнала при передаче данных, то есть изменяет его характеристики в соответствии с изменениями входного информационного сигнала, демодулятор осуществляет обратный процесс при приёме данных из канала связи. Модем выполняет функцию оконечного оборудования линии связи. Само формирование данных для передачи и обработки принимаемых данных осуществляет т.н. терминальное оборудование (в его роли может выступать и персональный компьютер).

Модемы широко применяются для связи компьютеров через телефонную сеть (*телефонный модем*) или кабельную сеть (*кабельный модем*).

2) *Планшетный персональный компьютер* — разновидность ноутбуков, оформившаяся после презентации аппаратно-программной платформы Microsoft Tablet PC в ноябре 2002 года. Оборудованы сенсорным экраном и позволяют работать при помощи стилуса или пальцев, как с использованием, так и без использования клавиатуры и мыши.

Главная отличительная особенность данного семейства ПК— аппаратная совместимость с IBM PC-компьютерами и установленные на них полноценные операционные системы, такие как:

- a) семейство Microsoft Windows NT (Windows XP Tablet PC Edition, Windows 7);
- b) Apple Mac OS X;
- c) Linux (полная настольная сборка одного из дистрибутивов этой ОС).

Такая операционная система позволяет пользователю использовать без ограничений любое программное обеспечение, доступное на настольном компьютере.

3) *iPad 4-го поколения* - это интернет-планшет, выпускаемый компанией Apple. Был представлен 23 октября 2012 года на презентации Apple в Сан-Хосе. Планшет получил более мощный процессор – Apple A6X, разъем Lightning, улучшенную переднюю камеру FaceTime HD и расширенную поддержку сетей 4G LTE.

## UNIT 3. Input devices

**Texts:** Input devices. Keyboard. Pointing devices. Mouse. Touch pad. TrackPoint. Trackball. Joystick. Touch screen. Graphics tablet. Scanner. Microphone. MIDI. Webcams.

1. *Read the following texts:*

### Input devices

Before a computer can process your data, you need some method to input the data into the machine. The device you use will depend on what form these data take (be it text, sound, artwork, etc.).

The term “input” is used both as a verb to describe the process of entering the data, and as noun referring to the data entered into the computer.

### Keyboard

The computer keyboard is used to enter text information into the computer, as when you type the contents of a report. The keyboard can also be used to type commands directing the computer to perform certain actions. Commands are typically chosen from an on-screen menu using a mouse, but there are often keyboard shortcuts for giving these same commands.

In addition to the keys of the main keyboard (used for typing text), keyboards usually also have a numeric keypad (for entering numerical data efficiently), a bank of editing keys (used in text editing operations), and a row of function keys along the top (to easily invoke certain program functions). Laptop computers, which don't have room for large keyboards, often include a “fn” key so that other keys can perform double duty (such as having a numeric keypad function embedded within the main keyboard keys).

Improper use or positioning of a keyboard can lead to repetitive-stress injuries. Some ergonomic keyboards are designed with angled arrangements of keys and with built-in wrist rests that can minimize your risk of RSIs.

Most keyboards attach to the PC via a PS/2 connector or USB port (newer). Older Macintosh computers used an ABD connector, but for several years now all Mac keyboards have connected using USB.

### Pointing devices

The graphical user interfaces (GUIs) in use today require some kind of device for positioning the on-screen cursor. Typical pointing devices are: mouse, trackball, touch pad, TrackPoint, graphics tablet, joystick, and touch screen.

Pointing devices, such as a mouse, connected to the PC via *serial ports* (old), PS/2 mouse port (newer), or USB port (newest). Older Macs used ADB to connect their mice, but all recent Macs use USB (usually to a USB port right on the USB keyboard)

## **Mouse**

The mouse pointing device sits on your work surface and is moved with your hand. In older mice, a ball in the bottom of the mouse rolls on the surface as you move the mouse, and internal rollers sense the ball movement and transmit the information to the computer via the cord of the mouse.

The newer optical mouse does not use a rolling ball, but instead uses a light and a small optical sensor to detect the motion of the mouse by tracking a tiny image of the desk surface. Optical mice avoid the problem of a dirty mouse ball, which causes regular mice to roll unsmoothly if the mouse ball and internal rollers are not cleaned frequently.

A cordless or wireless mouse communicates with the computer via radio waves (often using *Bluetooth* hardware and protocol) so that a cord is not needed (but such mice need internal batteries).

A mouse also includes one or more buttons (and possibly a scroll wheel) to allow users to interact with the GUI. The traditional PC mouse has two buttons, while the traditional Macintosh mouse has one button. On either type of computer you can also use mice with three or more buttons and a small scroll wheel (which can also usually be clicked like a button).

## **Touch pad**

Most laptop computers today have a touch pad pointing device. You move the on-screen cursor by sliding your finger along the surface of the touch pad. The buttons are located below the pad, but most touch pads allow you to perform “mouse clicks” by tapping on the pad itself.

Touch pads have the advantage over mice that they take up much less room to use. They have the advantage over trackballs (which were used on early laptops) that there are no moving parts to get dirty and result in jumpy cursor control.

## **TrackPoint**

Some sub-notebook computers (such as the IBM ThinkPad), which lack room for even a touch pad, incorporate a TrackPoint, a small rubber projection embedded between the keys of the keyboard. The TrackPoint acts like a little joystick that can be used to control the position of the on-screen cursor.

## **Trackball**

The trackball is a sort of like an upside-down mouse, with the ball located on top. You use your fingers to roll the trackball, and internal rollers (similar to what’s inside a mouse) sense the motion which is transmitted to the computer. Trackballs have the advantage over mice in that the body of the trackball remains stationary on your desk, so you don’t need as much room to use the trackball. Early laptop computers often used trackballs (before superior touch pads came along).

Trackballs have traditionally had the same problem as mice: dirty rollers can make their cursor control jumpy and unsmooth. But there are modern optical trackballs that don’t have this problem because their designs eliminate the rollers.

### **Joystick**

Joysticks and other game controllers can also be connected to a computer as pointing devices. They are generally used for playing games, and not for controlling the on-screen cursor in productivity software.

### **Touch screen**

Some computers, especially small hand-held PDAs, have touch sensitive display screens. The user can make choices and press button images on the screen. You often use a stylus, which you hold like a pen, to “write” on the surface of a small touch screen.

### **Graphics tablet**

A graphics tablet consists of an electronic writing area and a special “pen” that works with it. Graphics tablets allow artists to create graphical images with motions and actions similar to using more traditional drawing tools. The pen of the graphics tablet is pressure sensitive, so pressing harder or softer can result in brush strokes of different width (in an appropriate graphics program).

### **Scanner**

A scanner is a device that images a printed page or graphic by digitizing it, producing an image made of tiny pixels of different brightness and color values which are represented numerically and sent to the computer. Scanners scan graphics, but they can also scan pages of text which are then run through OCR (Optical Character Recognition) software that identifies the individual letter shapes and creates a text file of the page's contents.

### **Microphone**

A microphone can be attached to a computer to record sound (usually through a sound card input or circuitry built into the motherboard). The sound is digitized—turned into numbers that represent the original analog sound waves—and stored in the computer to later processing and playback.

### **MIDI**

MIDI (Musical Instrument Digital Interface) is a system designed to transmit information between electronic musical instruments. A MIDI musical keyboard can be attached to a computer and allow a performer to play music that is captured by the computer system as a sequence of notes with the associated timing (instead of recording digitized sound waves).

### **Webcams**

Webcams (short for Web cameras) let you send and receive live video pictures through the Internet. They're primarily used for video conferences – video calls – but they can be used to record photos and video onto your hard disk.

The resolution of webcams is expressed in megapixels (million pixels). Webcams connect to the PC via a USB (universal serial bus) or Fire Wire port; they display video at 24 to 30 frames (pictures) per second. Some include a headset with a microphone and earpiece.

2. *Speak on the diversity of input devices.*

3. *Which input devices would you use for these tasks:*

- 1) To play computer games
- 2) To read price labels in a shop
- 3) To copy images from paper into a computer
- 4) To select text and click on links on web pages
- 5) To enter drawings and sketches into a computer
- 6) To input voice commands and dictate text
- 7) To draw pictures or select menu options directly on the screen
- 8) To take and store pictures and then download them to a computer.

4. *Complete each sentence by choosing from the following devices: touch screen, trackball, touchpad, webcam.*

1) A .....is a stationary device that works like a mouse turned upside down. You roll the ball with your hand to move the pointer on the screen.

2) Interactive .....are used in museums, information centers and Internet kiosks. You use your finger to point directly to objects on the screen.

3) A .....is used to send live video images via the Internet.

4) A .....is found on notebook PCs. You use it by pressing the sensitive pad with a finger.

5. *Complete these sentences with the correct 'mouse action':*

1) To start a program or open a document you.....on its icon – that is, you rapidly press and release the mouse button twice.

2) If you want to select a menu option, you just .....on the left button.

3) If you want to find the commands for a particular text, image, etc., you have to .....on it.

4) If you want to move an object, press the button and .....the object to the desired location.

6. *Make a list of the things you can do with a voice-recognition system.*

7. *Decide if these sentences are True or False. If they are false, correct them:*

- 1) The details detected by a scanner are not determined by its resolution.

- 2) A barcode scanner is a computer peripheral for reading barcode labels printed on products.
- 3) Scanners cannot handle optical character recognition.
- 4) A digital camera uses a light sensitive film instead of a memory card for storing the images.
- 5) A digital video (DV) camera is used to take still photographs.
- 6) Video editing software allows you to manipulate video clips on the computer.

8. *Complete the advertisement with words from the webcam text:*

Having (1)..... with friends and family has never been easier or more enjoyable. You get the highest-quality audio and video, no matter which chatting solution you use. With the Web Cam Live! Ultra, its CCD image sensor with 640 x 480 (VGA) resolution produces rich, vibrant colors.

Combined with its (2) ..... 2.0 Hi-Speed connection, the result is top-quality, full-motion video at 30 (3).....per second for all your web conversations, even in dimly-lit rooms.

The WebCam Live! Ultra lets you do more. Let your voice be heard clearer than ever before with the included (4)....., unlike the built-in microphones in most other (5).....

Take still pictures at up to 1.3 (6) ..... resolution (interpolated), and enjoy the many great features that accompany the bundled award-winning WebCam Center software, such as motion detection, remote security monitoring, time lapse video capture and much more.

9. *Do you have a digital camera? Describe its basic features and the things you do with it.*

10. *Translate the text into English:*

*Устройства ввода* — периферийное оборудование для занесения (ввода) данных или сигналов в компьютер, либо другое электронное устройство во время его работы. Устройства ввода и вывода составляют аппаратный интерфейс между компьютером и сканером или 6DOF-контроллером.

Устройства ввода подразделяются на следующие категории:

- аудио, видео и механические устройства;
- непрерывные устройства ввода (к примеру, мышь, позиция которой изменяется достаточно быстро и постоянно, что может рассматриваться как непрерывный ввод);
- устройства для пространственного использования такие, как двухмерная мышь или трехмерный навигатор (особенно для CAD-приложений).

Также многие компьютерные указывающие устройства ввода классифицируются по способу управления курсором:

- прямой ввод, когда управление осуществляется непосредственно в месте видимости курсора. Например, сенсорные панели и экраны;
- не прямые указывающие устройства, к примеру, трекболы или мыши.

## UNIT 4. Output devices

### Texts: Output devices

#### 1. Memorize the words:

dot-matrix printer – точечно-матричный принтер

ink-jet printer – струйный принтер

pixel – элемент изображения

printer output – вывод на печать; распечатываемые данные

rendition = rendering – исполнение

spacing – расположение; местоположение

sharp image – четкое изображение

pitch – место

expansion slot – разъем для модуля расширения

burden – нагружать; отягощать

film transistor – пленочный транзистор

bulky – объемный, громоздкий

droplet – капелька

magenta – фуксин, красная анилиновая краска

cyan – синий

to fuse – растворяться; сливаться, объединяться

impact – удар, толчок; импульс; воздействие

impact printer – контактный принтер

to print – (рас)печатать; выводить на экран

#### 2. Read the following texts concerning output devices:

### Output device

After the computer has processed your data, you often need to produce output of the results. This output could be a display on the computer screen, hardcopy on printed pages, or even the audio playback of music you composed on the computer.

The term “output” is used both as a verb to describe the process of displaying the data, and as a noun referring to the data displayed by the computer.

### CRT Monitor

The traditional output device of a personal computer has been the CRT (Cathode Ray Tube) monitor. Just like a television set (an older one, anyway) the

CRT monitor contains a large cathode ray tube that uses an electron beam of varying strength to “paint” a picture onto the color phosphorescent dots on the inside of the screen, which is coated with substances called phosphors, which glow and create colors. CRT monitors are heavy and use more electrical power than flat panel displays, can flicker and emit radiation, but they are preferred by some graphic artists for their accurate color rendition, and preferred by some gamers for faster response to rapidly changing graphics.

Monitor screen size is measured diagonally across the screen, in inches. Not all of the screen area may be usable for image display, so the viewable area is also specified. The resolution of the monitor is the maximum number of pixels it can display horizontally and vertically (such as 800 x 600, or 1024 x 768, or 1600 x 1200). Most monitors can display several resolutions below its maximum setting. Pixels (short for picture elements) are the small dots that make the image displayed on the screen. The spacing of the screen’s tiny phosphor dots is called the dot pitch (dp), typically .28 or .26 (measured in millimeters). A screen with a smaller dot pitch produces sharper images. Brightness – the luminance of images is measured in cd/m<sup>2</sup> (candela per square meter). Color depth – the number of colors a monitor can display. For example, a CGA monitor produces 256 colors, enough for home use; a Super VGA can produce up to 16,7 million colors, so is ideal for photographic work and video games. Refresh rate – the number of time that the image is drawn each second. If a monitor has a refresh rate of 75 Hertz (Hz), it means that the screen is scanned 75 times per second. If this rate is low, you will notice a flicker, which can cause eye fatigue.

Your computer must produce a video signal that a monitor can display. This may be handled by circuitry on the motherboard, but is usually handled by a video card in one of the computer’s *expansion slots*; often the slot is a special one dedicated to video use, such as an AGP slot (Accelerated Graphics Port). Video cards are also called video display adapters, and graphics cards. Many video cards contain separate processors and dedicated video memory for generating complex graphics quickly without burdening the CPU. These accelerated graphics cards are loved by gamers.

### **Flat Panel Monitor**

A flat panel display usually uses an LCD (Liquid Crystal Display) screen to display output from the computer. The LCD consists of several thin layers that polarize the light passing through them. The polarization of one layer, containing long thin molecules called liquid crystals, can be controlled electronically at each pixel, blocking varying amounts of the light to make a pixel lighter or darker. Other types of flat panel technology exist (such as *plasma displays*) but LCDs are most commonly used in computers, especially laptops.

Older LCDs had slow response times and low contrast, but active matrix LCD screens have a transparent thin film transistor (TFT) controlling each pixel, so response, contrast, and viewing angle are much improved.

Flat panel displays are much lighter and less bulky than CRT monitors, and they consume much less power. They have been more expensive than CRTs in the past, but the price gap is narrowing. You will see many more flat panels in the future.

As with CRTs, the display size of a flat panel is expressed in inches, and the resolution is the number of pixels horizontally and vertically on the display.

### **Ink Jet Printer**

For hardcopy (printed) output, you need some kind of printer attached to your computer (or available over a network). The most common type of printer for home systems is the color ink jet printer. These printers form the image on the page by spraying tiny droplets of ink from the print head. The printer needs several colors of ink (cyan, yellow, magenta, and black) to make color images. Some photo-quality ink jet printers have more colors of ink.

Ink jet printers are inexpensive, but the cost of consumables (ink cartridges and special paper) makes them costly to operate in the long run for many purposes.

### **Laser printer**

A laser printer produces good quality images by the same technology that photocopiers use. A drum coated with photosensitive material is charged, and then an image is written onto it by a laser (or LEDs) which makes those areas lose the charge. The drum then rolls through toner (tiny plastic particles of pigment) that is attracted to the charged areas of the drum. The toner is then deposited onto the paper, and then fused into the paper with heat.

Most laser printers are monochrome (one color only, usually black), but more expensive laser printers with multiple color toner cartridges can produce color output.

Laser printers are faster than ink jet printers. Their speed is rated in pages per minute (ppm). Laser printers are more expensive than ink jets, but they are cheaper to run in the long term if you just need good quality black & white pages.

### **Other printers**

Multi-function printers are available that not only operate as a computer printer, but also include the hardware needed to be a scanner, photocopier, and FAX machine as well.

Dot matrix printers use small electromagnetically activated pins in the print head, and an inked ribbon, to produce images by impact. These printers are slow and noisy, and are not commonly used for personal computers anymore (but they can print multi-layer forms, which neither ink jet nor laser printers can).

A plotter is a special type of printer which uses ink and fine pens held in a carriage to draw detailed designs on paper. It's used in computer-aided design, maps, 3-D technical illustrations, etc.

### **Sound Output**

Computers also produce sound output, ranging from simple beeps alerting the user, to impressive game sound effects, to concert quality music. The circuitry to produce sound may be included on the motherboard, but high quality audio output from a PC usually requires a sound card in one of the expansion slots, connected to a set of good quality external speakers or headphones.

Multimedia is a term describing computer output that includes sound, text, graphics, movies, and animation. A sound card is an example of a multimedia output device (as is a monitor that can display graphics).

3. *Write out all abbreviations, decode and translate them.*
4. *Complete these sentences with words from the box:*

Printout; printer driver; print spooler; resolution; dpi; pages per minute (ppm); print server.

- 1) The differences in .....are noticeable: the more dots per inch, the clearer the image.
- 2) A print resolution of between 600.....and 2,400.....ensured that even text as small as 2 pt was legible.
- 3) Passengers with an electronic ticket will need a .....of ticket confirmation or a boarding pass to be admitted to secured gate areas.
- 4) The key advance of recent years is printing speed: the latest generation of ink-jet prints black-and white text at 15 ..... (.....).
- 5) With appropriate software, you can view the images on a computer, manipulate them, or send them to a .....and produce excellent quality color copies.
- 6) A .....is a dedicated computer that connects a printer to a network. It enables users to share printing resources.
- 7) A .....is a utility that organizes and arranges any documents waiting to be printed.
- 8) In computers, a .....is a program installed to control a particular type of printer.

5. *Choose the most appropriate type of printer for these situations from the description of printers:*

- 1) A home user who wants to print text documents and family photographs.
- 2) Business people who need to print in large quantities at high quality in an office.
- 3) Engineers who want to make detailed line drawings.
- 4) Professional typesetters in desktop publishing (e.g. to publish catalogues and magazines).
- 5) A company that wants to print carbon copies of bills and receipts.

6. Find terms which correspond to these definitions in the texts about printers:
- 1) A container that holds the ink in an ink-jet printer.
  - 2) Powdered ink used in laser printers.
  - 3) Small needles that press on the inked ribbon to make the characters on paper.
  - 4) Printer technology that produces text and pictures by hammering pins against a ribbon and the paper.
  - 5) A language that tells a printer how to print a document.
  - 6) A peripheral which combines a printer, a fax machine and photocopying and scanning capability into one device.

7. Describe the characteristics of the printer that you have or would like to have at home or at work.

8. Give details about: type of printer, speed, resolution, ink cartridges, price and customer support.

9. Reread the texts “CRT” and “Flat Panel Monitors” and then correct these statements:

- 1) The images shown on a monitor are not generated by video card.
- 2) All visible colors can be made from mixing the three primary colors of red, yellow and blue.
- 3) Typical CRT-based displays occupy less space than LCD displays.
- 4) Active-matrix LCDs do not use a technology called thin film transistor or TFT.
- 5) The size of the screen is measured horizontally.

10. Match each term with the correct definition:

- |                 |  |
|-----------------|--|
| 1) Phosphors    | a) the frequency at which a monitor renews its image in measured in Hz.                      |
| 2) LCD screen   | b) a flat-panel display which works by emitting light through a special liquid.              |
| 3) Pixel        | c) the space between a display’s pixels.   |
| 4) Dot pitch    | d) the smallest element in a displayed image.  |
| 5) Refresh rate | e) materials that emit light and produce colors when they are activated by an electron beam. |

11. Complete the technical specifications of the monitor:

<i>Quick specs</i>	
The new Paintview XT – 85 combines a television and a computer (1).....in on display.	
Type of display	Flat panel LCD

(2).....	19 inches
(3)Display.....	1,280 x 1,024 pixels
Dot pitch	0,294 mm
(4).....	16,7 million colors
Contrast ratio	1,000:1
(5).....	450 cd/m2
Built-in TV tuner	
Audio	Two 3-watt speakers and a 5 – watt subwoofer; headphone jack
The Picture-in-Picture function allows you to watch more than one program at the same time and lets you adjust the size of each window.	

12. *Translate the text into English:*

Устройства вывода - это устройства, которые переводят информацию с машинного языка в формы, доступные для человеческого восприятия.

К устройствам вывода относятся:

1) Монитор (дисплей) - универсальное устройство визуального отображения всех видов информации. Различают алфавитно-цифровые и графические мониторы, а также монохромные мониторы и мониторы цветного изображения - активно-матричные и пассивно-матричные жидкокристаллические мониторы.

2) Принтер - устройство для вывода информации в виде печатных копий текста или графики. Существуют:

а) *Лазерный принтер* – печать формируется за счет эффектов ксерографии.

б) *Струйный принтер* – печать формируется за счет микро капель специальных чернил.

в) *Матричный принтер* – формирует знаки несколькими иглами, расположенными в головке принтера. Бумага втягивается с помощью вала, а между бумагой и головкой принтера располагается красящая лента.

3) Акустические колонки и наушники – устройство для вывода звуковой информации.

13. *Write down a summary of this text in English.*

## UNIT 5. Processing

**Texts:** The processor; RAM and ROM; Units of memory.

1. *Memorize the words:*

central processing unit (CPU) – центральный процессор (ЦП)

internal memory – внутренняя память; внутреннее ЗУ  
to issue – посылать (сигнал); выводить, выдавать (сообщение)  
response – ответ; отклик; реакция; отвечать; реагировать  
to interpret – интерпретировать; истолковывать  
input-output port – порт ввода-вывода  
control unit (CU) – устройство управления  
arithmetic-logical unit (ALU) – арифметико-логическое устройство  
step-by-step operations – пошаговые операции  
call for – требовать; предусматривать  
to load – загружать; выполнять загрузку  
register – регистр; счетчик; датчик; устройство регистрации  
clock – часовой механизм  
sink – зд. корпус  
fin – зд. ребро, заусенец  
fan – вентилятор  
bus – шина; канал; линия (передачи данных)  
expansion slot – разъем для модуля расширения  
capability – способность; возможность

### **The processor**

The microprocessor is the component of the personal computer that does the actual processing of data. A microprocessor is a central processing unit (CPU) that fits on one microchip. It is the “brain” of the computer, but that is a rather pretentious term since it really just a very complex switching circuit that executes simple instructions very rapidly.

The microprocessor integrated circuit package holds a silicon chip that contains millions of transistors and other components fabricated into the silicon. Because the transistors on the chip are very tiny, even a small zap of high voltage current (such as from static electricity) can destroy a chip. This is why all large-scale integrated circuits must be handled in ways that minimize the possibility of static electric discharge.

Because of the large amount of circuitry packed into such a tiny area, microchips produce a lot of heat and they require cooling systems to keep the chip from overheating. On computer motherboards the CPU chip is covered by a large metal *heat sink* with “fins” to allow airflow from *cooling fans* to carry the heat away.

There are three typical parts:

- the *control unit*, which examines instructions from memory and executes them;
- the *arithmetic and logic unit (ALU)*, which performs arithmetic and logical operations;
- the *registers*, high-speed units of memory used to store and control data.

The speed of a processor is measured in *gigahertz (GHz)*. Thus, a CPU running at 4 GHz can make about four thousand million calculations a second. An

internal *clock* sends out signals at fixed intervals to measure and synchronize the flow of data.

The main circuit board is known as the *motherboard*. This contains the CPU, the memory chips, expansion slots and controllers for peripherals, connected by internal *buses*, or paths, that carry electronic signals. For example, the *front side bus* carries all data that pass from the CPU to other devices.

*Expansion slots* allow you to install *expansion cards* which provide extra functions, e.g. a video card or a modem. Laptops have PC cards, the size of a credit card, which add features like sound, memory and network capabilities.

2. Look through the text then match the sentence beginning (1-6) with the correct endings (a-f):

- |  |  |
|--|--|
| 1) The CPU processes data and                    | a) you can't make changes to it.                     |
| 2) The control unit is the part of the CPU that  | b) the computer is turned off.                       |
| 3) The arithmetic and logic unit is able to make | c) controls the way instructions are executed.       |
| 4) The registers are high-speed storage          | d) areas within the CPU.                             |
| 5) Data contained in RAM is lost when            | e) coordinates the other parts of the computer       |
| 6) ROM memory can only be read:                  | f) calculations: add, subtract, multiply and divide. |

3. Answer the questions:

1) What components make up the heart of the computer system? 2) What is the function of the CPU? 3) In what way does the CPU control the operation of the whole system? 4) Name the sequence of operations the CPU performs. 5) What are the CPU functional units made of? 6) What is the function of the CU? 7) What operations are performed in the ALU? 8) Where are data processed? 9) Where are data to be processed loaded into?

4. Remember the meaning of the words and try to translate the combinations with these words:

*Processor*: data processor; arithmetic processor; command processor; central processor; control processor; error processor; general – purpose processor; special – purpose processor; image processor; language processor; mail processor; message processor; numeric processor; parallel processor; peripheral processor; text processor.

*Level*: access level; application level; data level; device level; difficulty level; error level; function level; hardware level; high level; input level; output level; performance level; presentation level; program level; protection level; resource level; security level; software level; structural level system level; transmission level.

*Direction:* backward direction; clockwise direction; counter-clockwise direction; data direction; forward direction; inverse/reverse direction; negative direction, positive direction; printing direction; transmission direction.

*Step:* conversion step; final step; procedure step; program step; programming step; step by step; one step at a time; to step down; to step out; to step up; to take steps.

*Switch:* to switch between programs; to switch between windows; to switch disks; to switch on; to switch off; to switch over; binary switch; command switch.

5. *Translate into English:*

Управлять работой всей системы; управлять ходом выполнения программы; порт ввода-вывода; режим включения-выключения; электрическая цепь; выполнять инструкции; сложная интегральная схема; материнская плата; разъем для модуля расширения; выполнить вычисления.

6. *Study the following:*

### **RAM and ROM**

When you run a program, the CPU looks for it on the hard disk and transfers a copy into the RAM. RAM (random access memory) is temporary or volatile, that is, it holds data while your PC is working on it, but loses these data when the power is switched off.

However, ROM (read only memory) is permanent and contains instructions needed by the CPU. The BIOS (basic input/output system) uses ROM to control communication with peripherals, e.g. disk drives.

The amount of RAM determines the number of programs you run simultaneously and how fast they operate. It can be expanded by adding extra RAM chips.

### **Units of memory**

The electronic circuits in computers detect the difference between two states: ON (the current passes through) or OFF (the current doesn't); they represent these states as 1 or 0. Each 1 or 0 is called a *binary digit or bit*.

Bits are grouped into eight-digit codes that typically represent characters (letters, numbers and symbols). Eight bits together are called a *byte*. For example, 01000001 is used for the character A. Computers use a standard code called ASCII for the binary representation of characters.

In order to avoid complex calculations of bytes, we use bigger units. A *kilobyte* (KB) is 1,024 bytes; a *megabyte* (MB) is 1,024 kilobytes; a *gigabyte* (GB) is 1,024 megabytes; a *terabyte* (TB) is 1,024 gigabytes. We use these units to describe the RAM memory, the operating capacity of disks and the size of a program or document.

7. *Read this product description and answer the questions below:*

Processor and memory:

- Intel Core 2 Duo processor at 2.4 GHz.
  - 533 MHz Front Side Bus.
  - 1,024 MB of RAM; can be expanded up to 4 GB.
- 200 GB Hard disk  
Double Layer DVD +/R/RW drive  
Microsoft Windows

1. How fast is the CPU?
2. Which term is used to describe the CPU data bus?
3. How much RAM does the computer have?
4. Can you add extra RAM chips? How many?

8. *Read the text and make up a plan to it:*

It is known that of the fundamental parts of the computer is a control unit. This unit controls the computation process automatically, without man's participation. It sends signals to all other parts of the computer to specify what they must do. First of all, the control unit tells the main memory what data must be transferred to the arithmetic-logical unit and other devices. Then it enables the arithmetic-logical unit to perform the required operation. Finally, it places the obtained results in the main memory.

It is important to note that the control unit operation is determined by an algorithm of a problem solution. The algorithm is a sequence of arithmetic and logical operations. These operations must be performed on the initial data for solving the problem.

Description of an algorithm in a form acceptable by a computer is called a program. A program is a list of sequential computer instructions enabling a computer to solve a problem. In order to be acceptable by the computer instructions must be encoded into a digital form.

In conclusion it should be pointed out that the main feature of a computer is automatic control of the problem solution process. It is based on the programmed-control principle.

9. *Write down a resume in English using the plan. Entitle the text.*

## **UNIT 6. Operating systems**

**Texts:** Operating systems; Types of software; the operating system (OS); The Graphical User Interface; System utilities; How the Operating System Uses Memory; Operating System Functions.

1. *Read and translate the texts:*

### **Operating Systems**

An operating system is a collection of integrated computer programs that provide recurring services to other programs or to the user of a computer. These services consist of disk and file management, memory management, and device management. In other words, it manages CPU operations, input/output activities, storage resources, diverse support services, and controls various devices.

Operating system is the most important program for computer system. Without an operating system, every computer program would have to contain instructions telling the hardware each step the hardware should take to do its job, such as storing a file on a disk. Because the operating system contains these instructions, any program can call on the operating system when a service is needed.

### **Need to Study Operating System?**

There are many different computer systems and several available operating systems. Thus, users must know what each operating system can do and cannot do to meet their necessity. Today, many operating systems are used for general use or sometimes for specific use. Then, which one is best for a specific purpose? The reason that users need to study operating system is here.

The predominant microcomputer operating system for IBM and IBM-compatibles so far was DOS (Disk Operating System). It has different versions including MS-DOS, PC-DOS and others. DOS is very popular and wide spread, but it has some limitations. Users need to learn DOS although it may fade out in a few years and has some weakness, because it will be used for the next several years. The other popular operating system was the Apple Macintosh operating system.

As more powerful microcomputers become commonplace, more advanced operating systems are needed. Microcomputer users are beginning to demand more powerful operating system that can run powerful microcomputers more efficiently. Today's very powerful microcomputers are demanding more complex and refined operating system that can do multiple functions. They also ask an easier user interface than old operating systems did. Now, there are more than six popular operating systems, leading to the lack of a standard. The other reason that operating system should be learned is here.

### **Types of software; the operating system (OS)**

*System software* controls the basic functions of a computer, e.g. operating systems, programming software and utility programs.

*Application software* lets you do specific jobs such as writing letters, doing calculations, drawing or playing games. Examples are a word processor or a graphics package.

An *operating system* is a set of programs that control the hardware and allow people and applications to communicate with the hardware. Typical functions of the OS are handling input/output operations, running programs and organizing files on disks. The OS also gives access to networks and allows *multitasking* a user can run several programs (and do various tasks) at a time. Examples are:

- the *Windows family* – designed by Microsoft and used on most PCs;
- *Mac OS* – created by Apple and used on Macintosh computers;
- *Unix* – found on mainframes and workstations in corporate installations, as it supports multi-users;
- *Linux* – developed under the GNU General public License; anyone can copy its source code, modify and redistribute it. It is used on PCs and appliances and small devices.

### **The Graphical User Interface**

A *GUI* makes use of a *WIMP* environment: Windows, Icons, Menus and Pointer. This type of interface is *user-friendly*, where system functions are accessed by selecting self-explanatory *icons* (pictures representing *programs or documents*) and items from menus. A *drop-down menu*, or *pull-down menu*, is a list of operations that appear below a menu bar when you click on an item.

The *pointer* is an arrow, controlled by the mouse, which lets you choose options from menus.

The background screen that displays icons, representing programs, files and *folders* (directories) is called the *desktop*. Double clicking a folder icon opens a *window* which shows the programs, documents and other folders contained within the folder.

### **System utilities**

There are small programs included with an OS that improve a system's performance. They can be desk accessories, device drivers, or system extensions activated when you turn on the PC.

- A *crashed disk rescuer* is used to restore disks and corrupted files.
- An *accessibility program* makes a PC easier for disabled users to use.
- A *compression utility* rewrites data so that it takes less space on disk.
- A *media player* lets you watch DVDs, play music and listen to the radio on the Web.

2. Look through the texts and find the following:

- 1) the meaning of “multitasking”;
- 2) the difference between system software and application software;
- 3) software that enables users and programs to communicate with hardware;
- 4) a multi-user OS used on large, powerful computer systems;

- 5) the operating system that is freely distributed;
  - 6) the operating system designed by Apple;
  - 7) the OS created by Microsoft;
  - 8) the meaning used to describe a system that is easy to use.
3. *Which utility would you use to do these tasks?*
- 1) to play and organize multimedia on your PC?
  - 2) to diagnose and repair damaged disks.
  - 3) to help computer users with sight, hearing or mobility difficulties.
  - 4) to make file smaller, so you can send them with emails.
4. *Explain why Windows is so popular.*
5. *Look at the Internet and find two operating systems designed for hand-held devices such as PDAs, palmtops and blackberries.*
6. *Memorize the words:*

bootstrapping – начальная загрузка

boot-up – загрузка

interrupt vector – вектор прерываний

DOS – disk operating system – дисковая операционная система

### **How the Operating System Uses Memory**

Here explains in case of *DOS*. When a personal computer is turned on, it searches specific locations on the disk drives for operating system files. If the PC finds the files, it loads the first of them into memory. A set of operating system files then takes over, loading the rest of the main files into memory in a specific order. Because the operating system is in a sense, loading itself or lifting itself by its own bootstraps, this operation is called the boot-up.

At the lowest part of memory, the operating system loads a table of interrupt vectors. When the operating system receives special codes called interrupts, it uses the table to detect where in memory it can find matching instructions. DOS also uses a small area just above the interruption table to hold the BIOS data called 'flags' that record the state of various system conditions. The same area also acts as a buffer to store keystrokes that come in faster than the system can process them.

A large expanse of memory just above the BIOS flags and keyboard buffer is used for device drivers, utility programs, and application programs. When DOS reads the CONFIG.SYS and AUTOEXEC.BAT files, it looks for command lines to load drivers or memory-resident programs. Memory - resident programs are those that continue to be active even when application programs are running. When it finds such a command line, DOS normally puts the driver or program at the start of

this large memory area. Device drivers usually remain loaded until the PC is turned off. Memory - resident programs can be unloaded if no other programs are loaded after them.

7. *Decode the abbreviations in the text, translate the text:*

### **Operating System Functions**

An operating system executes many functions to operate computer system efficiently. Among them, four essential functions are the followings.

- *Resource Management:* An operating system manages a collection of computer hardware resources by using a variety of programs. It manages computer system resources, including its CPU, primary memory, *virtual memory*, secondary storage devices, input/output peripherals, and other devices.

- *Task Management:* The function of the operating system that controls the running of many tasks. It manages one program or many programs within a computer system simultaneously. That is, this function of operating system manages the completion of users' tasks. A task management program in an operating system provides each task and interrupts the CPU operations to manage tasks efficiently. Task management may involve a *multitasking* capability.

- *File management:* This is a function that manages data files. An operating system contains file management programs that provide the ability to create, delete, enter, change, ask, and access of files of data. They also produce reports on a file.

- *User Interface:* It is a function of an operating system that allows users to interact with a computer. A user interface program may include a combination of menus, screen design, keyboard commands. A well-designed user interface is essential for an operating system to be popular. Because of the function, users can load programs, access files, and accomplish other tasks.

8. *Speak about operating system functions.*

9. *Write a summary to the text in English.*

## **UNIT 7. Programming**

**Texts:** Programming; Programming languages; Steps in writing a program.

1. Memorize the words:

to maintain – поддерживать; сохранять; эксплуатировать

domain – область

implementation – выполнение

ongoing – текущий; проходящий сейчас

extent – протяжение; размер; круг; диапазон; степень

evolve – развивать(ся); эволюционировать

entity – существо, организм, организация

cognitive познавательный

yield – приносить; производить; уступать; поддаваться

acknowledge – признавать; подтверждать

## 2. *Read and translate the texts:*

### **Programming**

*Computer programming* (often shortened to *programming*, *scripting*, or *coding*) is the process of designing, writing, testing, debugging, and maintaining the source code of computer programs. This source code is written in one or more programming languages (such as C++, C#, Java, Python, Smalltalk, etc.). The purpose of programming is to create a set of instructions that computers use to perform specific operations or to exhibit desired behaviors. The process of writing source code often requires expertise in many different subjects, including knowledge of the application domain, specialized algorithms and formal logic.

Within software engineering, programming (the *implementation*) is regarded as one phase in a software development process.

There is an ongoing debate on the extent to which the writing of programs is an art form, a craft, or an engineering discipline. In general, good programming is considered to be the measured application of all three, with the goal of producing an efficient and evolvable software solution (the criteria for "efficient" and "evolvable" vary considerably). The discipline differs from many other technical professions in that programmers, in general, do not need to be licensed or pass any standardized (or governmentally regulated) certification tests in order to call themselves "programmers" or even "software engineers." Because the discipline covers many areas, which may or may not include critical applications, it is debatable whether licensing is required for the profession as a whole. In most cases, the discipline is self-governed by the entities which require the programming, and sometimes very strict environments are defined (e.g. United States Air Force use of AdaCore and security clearance). However, representing oneself as a "Professional Software Engineer" without a license from an accredited institution is illegal in many parts of the world.

Another ongoing debate is the extent to which the programming language used in writing computer programs affects the form that the final program takes. This debate is analogous to that surrounding the Sapir–Whorf hypothesis in linguistics and cognitive science, which postulates that a particular spoken language's nature influences the habitual thought of its speakers. Different language patterns yield different patterns of thought. This idea challenges the possibility of representing the world perfectly with language, because it acknowledges that the mechanisms of any language condition the thoughts of its speaker community.

## Programming languages

**Programming** is a process of writing a program using a computer language. A *program* is a set of instructions which a computer uses to do a specific task (e.g. a solution to a Math problem).

The only language a PC can directly execute is *machine code*, which consists of 1s and 0s. This language is difficult to write, so we use symbolic languages that are easier to understand. For example, *assembly languages* use abbreviations such as ADD, SUB, MPY to represent instructions. The program is then translated into machine code by software called an *assembler*.

Machine code and assembly languages are called low-level languages because they are closer to the hardware.

*High-level languages*, however, are closer to human languages; they use forms resembling English, which makes programming easier. The program is translated into machine code by software called a compiler. Some examples are:

- FORTRAN – used for scientific and mathematical applications;
- COBOL – popular for business applications;
- BASIC – used as a teaching language; Visual BASIC is now used to create Windows applications;
- C – used to write system software, graphics and commercial programs;
- Java – designed to run on the Web; *Java applets* are small programs that run automatically on web pages and let you watch animated characters, and play music and games.

The languages used to create Web documents are called markup languages; they use instructions (markups) to format and link text files. Examples are:

- HTML – the code used to create Web pages;
- VoiceXML – it makes Internet content accessible via *speech recognition* and phone. Instead of using a web browser on a PC, you use a telephone to access voice-equipped websites. You just *dial* the phone number of the website and then give spoken instructions, *commands*, and get the required information.

### 3. Match the terms with their definitions:

- |                        |  |
|------------------------|--|
| 1) programming         | a) basic language which consists of binary codes                   |
| 2) machine code        | b) programming language such as C, Java or Visual BASIC            |
| 3) assembly language   | c) writing computer programs                                       |
| 4) high-level language | d) low-level language translated into machine code by an assembler |
| 5) Java applet         | e) software which converts a source program into machine code      |
| 6) compiler            | f) language used to create and format documents for the Web        |
| 7) markup language     | g) small self-contained program written in Java                    |

4. *Read the text:*

### Steps in writing a program

To write a program, software developers usually follow these steps.

- First they try to understand the problem and define the purpose of the program.
- They design a *flowchart*, a diagram which shows the successive logical steps of the program.
- Next they write the instructions in a high-level language (Pascal, C, etc.) this is called *coding*. This program is then *compiled*.
- When the program is written, they *test* it: they run the program to see if it works and use special tools to detect *bugs*, or errors. Any errors are corrected until it runs smoothly. This is called *debugging*, or bug fixing.
- Finally software companies write a detailed description of how the program works, called *program documentation*. They also have a *maintenance* program. They get reports from users about any errors found in the program. After it has been improved, it is published as an updated version.

5. *Look through the text and put these programming steps in the correct order:*

Document and maintain the program  
Test the program and detect bugs  
Make flowchart  
Write code and compile  
Analyze the problem  
Debug and correct it if necessary

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

5. \_\_\_\_\_ Does it work?      6. \_\_\_\_\_

6. *Answer these questions:*

- 1) What is the difference between natural and programming languages?
- 2) How can programming languages be translated into machine language?
- 3) How can machine language be defined?
- 4) What does a computer's assembly language correspond to?
- 5) Why are machine languages and the assembly languages identical for all types of computers?

7. *Complete the article about the **Voice XML** application language with the words from the box.*

HTML      dial      Voice XML      commands      speech recognition

### **Internet: Voice recognition takes off**

You don't need a sophisticated cell phone to surf the Internet when you're on the road – just your own voice. That's the idea behind a new breed of voice service that is popping up all over the place. Subscribers (1)\_\_\_\_\_ a toll-free phone number and use spoken (2)\_\_\_\_\_ to listen to anything from weather conditions to stock quotes, or flight information to news stories. Half a dozen of these services – such as Audiopoint, BeVocal, TellMe and Telsurf Networks – have already gone live or are testing their systems.

These launches are all happening because two crucial technologies have come of age. (3)\_\_\_\_\_ software from companies such as Lucent, Nuance and Speechworks can now understand a wide range of accents and diction without having to be trained to a specific voice. And computer languages such as Voice XML make it as easy to write voice services as (4)\_\_\_\_\_ has made it to write web pages. With (5)\_\_\_\_\_, the human voice becomes a substitute for a computer mouse and the spoken command for a click. It doesn't, however, call up conventional web pages, but content which is especially composed for a telephone: sound clips, numbers, music, spoken texts.

*The Economist*

8. *Read and translate the text then write a summary to it.*

### **Programming languages**

Different programming languages support different styles of programming (called *programming paradigms*). The choice of language used is subject to many considerations, such as company policy, suitability to task, availability of third-party packages, or individual preference. Ideally, the programming language best suited for the task at hand will be selected. Trade-offs from this ideal involve finding enough programmers who know the language to build a team, the availability of compilers for that language, and the efficiency with which programs written in a given language execute. Languages form an approximate spectrum from "low-level" to "high-level"; "low-level" languages are typically more machine-oriented and faster to execute, whereas "high-level" languages are more abstract and easier to use but execute less quickly. It is usually easier to code in "high-level" languages than in "low-level" ones.

Allen Downey, in his book *How to Think Like a Computer Scientist*, writes: "The details look different in different languages, but a few basic instructions appear in just about every language:

- *input*: Gather data from the keyboard, a file, or some other device.
- *output*: Display data on the screen or send data to a file or other device.
- *arithmetic*: Perform basic arithmetical operations like addition and multiplication.
- *conditional execution*: Check for certain conditions and execute the appropriate sequence of statements.

- *repetition*: Perform some action repeatedly, usually with some variation.”

Many computer languages provide a mechanism to call functions provided by libraries. Provided the functions in a library follow the appropriate run time conventions (e.g., method of passing arguments), then these functions may be written in any other language.

## UNIT 8. Networks

**Texts:** Networks, network topology; LANs; WANs; What the Internet is; Components of the Internet

1. *Read and translate the texts:*

### Networks

#### LANs (Local Area Networks)

*Networking* allows two or more computer systems to exchange information and share resources and peripherals.

*LANs* are usually placed in the same building. They can be built with two main types of architecture: *peer-to-peer*, where the two computers have the same capabilities, or *client-server*, where one computer acts as the *server* containing the main hard disk and controlling the other *workstations or nodes*, all the devices linked in the network (e.g. printers, computers, etc.).

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 link a LAN to another network, e.g. to the Net.

Most networks are linked with cables or wires but new *Wi-Fi, wireless fidelity*, technologies allow the creation of *WLANs*, where cables or wires are replaced by radio waves.

To build a WLAN you need *access points*, radio-based receiver-transmitters that are connected to the wired LAN, and *wireless adapters* installed in your computer to link it to the network.

*Hotspots* are WLANs available for public use in places like airports and hotels, but sometimes the service is also available outdoors (e.g. university campuses, squares, etc.).

### Network topology

*Topology* refers to the shape of a network. There are three basic physical topologies:

- *Star*: there is a central device to which all the workstations are directly connected. This central position can be occupied by a server, or a *hub*, a connection point of the elements of a network that redistributes the data.
- *Bus*: every workstation is connected to a main cable called a bus.

- *Ring*: the workstations are connected to one another in a closed loop configuration.

There are also mixed topologies like the *tree*, a group of stars connected to a central bus.

### WANs (Wide Area Networks)

WANs have no geographical limit and may connect computers or LANs on opposite sides of the world. They are usually linked through telephone lines, fiber-optic cables or satellites. The main transmission paths within a WAN are high-speed links called *backbones*.

*Wireless WANs* use mobile telephone networks.

The largest WAN in existence is the Internet.

2. *Look through the texts and correct the following statements.*

- 1) In a client-server architecture, all the workstations have the same capabilities.
- 2) LANs link computers and other devices that are placed far apart.
- 3) The word protocol refers to the shape of the network.
- 4) Routers are used to link two computers.
- 5) Access points don't need to be connected to a wired LAN.
- 6) Wireless adapters are optional when you using a WLAN.
- 7) Hotspots can only be found inside a building.
- 8) The Internet is an example of a LAN.
- 9) Wireless WANs use fiber and cable as linking devices.

3. *Use the words in the box to complete the sentences.*

LAN	nodes	hub	backbones
WLAN	peer-to peer	server	

- 1) All the PCs on a \_\_\_\_\_ are connected to one \_\_\_\_\_, which is a powerful PC with a large hard disk that can be shared by everyone.
- 2) The style of \_\_\_\_\_ networking permits each user to share resources such as printers.
- 3) The star is a topology for a computer network in which one computer occupies the central part and the remaining \_\_\_\_\_ are linked solely to it.
- 4) At present Wi-Fi systems transmit data at much more than 100 times the rate of a dial-up modem, making it an ideal technology for linking computers to one another and to the Net in a \_\_\_\_\_.
- 5) All of the fiber-optic \_\_\_\_\_ of the United States, Canada and Latin America cross Panama.
- 6) A \_\_\_\_\_ joins multiple computers (or other network devices) together to form a single network segment, where all computers can communicate directly with each other.

4. Read these descriptions of different physical topologies of communication networks and match them with the terms in the text “Network topology”.

- 1) All the devices are connected to a central station.
- 2) In this type of network there is a cable to which all the computers and peripherals are connected.
- 3) Two or more star networks connected together; the central computers are connected to a main bus.
- 4) All devices (computers, printers, etc.) are connected to one another forming a continuous loop.

5. Write a list of the advantages and disadvantages of using networks.

### **What the Internet is**

The *Internet* is an *International Computer Network* made up of thousands of networks linked together. All these computers communicate with one another; they share data, resources, transfer information, etc. to do it they need to use the same language or *protocol: TCP / IP (Transmission Control Protocol/Internet protocol)* and every computer is given an address or *IP number*. This number is a way to identify the computer on the Internet.

To use the Internet you basically need a computer, the right connection software and a modem to connect your computer to a telephone line and then access your *ISP (Internet Service Provider)*.

The modem converts the digital signals stored in the computer into analogue signals that can be transmitted over telephone lines. There are two basic types: *external* with a cable that is plugged into the computer via a USB port, and *internal*, an expansion card inside the computer. A *PC card* modem is a different, more versatile option for laptops and mobile phones.

At first most computers used a *dial-up* telephone connection that worked through the standard telephone line. Now a *broadband* connection, a high data transmission rate Internet connection, has become more popular: either *ADSL (Asymmetric Digital subscriber Line)*, which allows you to use the same telephone line for voice and fast access to the Internet, or *cable*, offered by most TV cable providers.

The basic equipment has changed drastically in the last few years. You no longer need a computer to use the Internet. **Web TV** provides email and access to the Web via a normal TV set plus a high-speed modem. More recently, 3Generation mobile phones and PDAs, personal digital assistants, also allow you to go online with *wireless* connections, without cables.

Telephone lines are not essential either. *Satellites* orbiting the earth enable your computer to send and receive Internet files. Finally, the *power-line Internet*, still under development, provides access via a power plug.

## Components of the Internet

The Internet consists of many systems that offer different facilities to users.

*WWW, the World Wide Web*, a collection of files or pages containing links to other documents on the Net. It's by far the most popular system. Most Internet services are now integrated on the Web.

*Email*, or electronic mail, is for the exchange of messages and attached files.

*Mailing lists (or listservs)* based on programs that send messages on a certain topic to all the computers whose users have subscribed to the list.

*Chat and instant messaging*, for real-time conversations; you type your messages on the keyboard.

*Internet telephone*, a system that lets people make voice calls via the Internet.

*Video conference*, a system that allows the transmission of video and audio signals in real time; so the participants can exchange data, talk and see one another on the screen.

*File Transfer Protocol (FTP)*, used to transfer files between computers.

*Newsgroups*, where people send, read and respond to public bulletin board messages stored on a central computer.

*TELNET* is a program that enables a computer to function as a terminal working from a remote computer and so use online databases or library catalogues.

6. *Decide if these sentences are True or False. If they are false, correct them.*

1) The Internet and the World Wide Web are synonyms.

2) Computers need to use the same protocol (TCP/IP) to communicate with each other.

3) Web TV can provide access to the Net.

4) ADSL and cable are two types of dial-up connections.

5) External, internal and PC card are types of connections.

6) Information can be sent through telephone lines, satellites and power lines.

7) The computer IP number is a way to identify it on the Internet.

7. *What Internet system should these people use?*

1) "I'd like to avoid flying to Japan to attend the meeting but I want to see what's going on there."

2) "I like receiving daily updates and headlines from newspapers on my computer."

3) "I'm doing some research and need computer access to the University library."

4) I want to read people's opinions about environmental issues and express my views."

5) "I have designed a web page and want to transfer the data to my reserved web space."

6) "I'd like to check my students' draft essays on my computer and sent them back with my suggestions."

7) “I don’t want to spend too much money on international phone calls but I love hearing his voice.”

8) “I live in a small village where there are no other teenagers. I wish I had the chance to meet and chat with friends.”

8. *Read the text, make up the plan. Write a summary to it in English.*

### **Networks**

You will often have the need to connect your computer to other computers in order to share information. This is typically done with a connection to a data network, or with a connection over a telephone line

A Local Area Network (LAN) is used to connect computers spread over a relatively small area, such as a university campus, or several offices in a building, or a home. The computers on the network can share data, and they can also access printers connected to the network. All of the computers and printers on the network are called nodes of the network.

If your personal computer is connected to a network, it is called a network workstation (note that this is different from the usage of the term *workstation* as a high-end microcomputer). If your PC is not connected to a network, it is referred to as a standalone computer

In order to connect to a network, your computer will need a network adapter. This circuitry and port could be built into the motherboard or it could be on a network interface card (NIC) in one of the computer’s expansion slots. Your computer will also need the necessary networking software installed. **Ethernet** is the most common networking technology used.

If the computers connected to a network have equal status, it is called a peer-to-peer network. A typical home network might be done this way.

Larger LANs usually have one or more computers that act as *file servers* to provide data and software to the other computers on the network. The other workstations are referred as client computers, and this is a server/client network. You may also find terminals connected as nodes on a network (terminals have only a screen and a keyboard, and no processing power; they connect over the network to a computer that does the actual processing).

### **Telecommunication**

Telecommunication refers to transmitting data over a long distance. For personal computers, this usually entails connecting to other computers over a telephone line or other connection.

A telephone line carries an analog signal, one that has a continuously varying waveform. This is different from the discrete digital signals that represent numbers in your computer. To communicate over a phone line, your computer needs a modem (which stands for *modulator-demodulator*). The modem takes the digital information from your computer and modulates it onto an analog wave in the range

of sound frequencies that can be carried over phone lines. The modem also takes analog signals from the phone line and demodulates them to extract the digital information, which it passes to your computer. The computer on the other end of the phone line is also equipped with a modem.

Computer modems typically communicate at 56K (56 kilobits per second), but if your phone connection is not good the modems will shift to a slower speed at which a reliable exchange of data can take place. A telecommunications connection via a phone modem is called a dial-up connection.

Many modems can also function as fax machines. You can “print” a document as a fax image to send to a distant fax machine.

### **Broadband**

Many users found 56K telephone modem connections too slow (especially with increased popularity of the Internet). Broadband connections allow faster transfer of information. The most popular kinds are DSL, cable, and satellite.

A DSL (Digital Subscriber Line) connection works over your telephone line and requires a special DSL modem. Unlike a regular modem, the DSL modem signal is carried at higher frequencies, beyond those of sound. It has a wider bandwidth since it is not limited to the audio band, and it has the advantage that you can use the telephone line simultaneously for voice and DSL communications. DSL requires special equipment installed at the phone company end, and you must not be located too far from the phone company’s junction.

A cable connection (requiring a special cable modem) uses your cable television line to transmit and receive data. Similarly, a link to satellite TV broadcast satellites can be used to provide broadband access to areas DSL or cable TV can't service.

### **The Internet**

One of the primary reasons for getting a network or telecommunications connection for your computer is to access the Internet. The Internet is a wide area network (WAN) that spans the globe and uses the TCP/IP protocol to transmit information. To access the Internet, you need a dial-up or broadband connection through an Internet Service Provider (ISP), or access to a network that has a gateway connection to the Internet.

Many information resources and services are available via the Internet; the two most popular are electronic mail (e-mail) and the World Wide Web (the Web). Both of these services use a client/server model: there are servers on the Internet that handle e-mail traffic or offer web pages. To access these, you need to run appropriate client software on your computer. Popular e-mail clients include Thunderbird, Apple's Mail program, and Outlook Express. World Wide Web client programs are called web browsers, and popular examples are Internet Explorer, Chrome, Netscape, Opera, Firefox, and Safari.

Electronic mail entails sending and receiving private messages between users connected to the Internet. (This is different from public posting of messages on electronic forums such as Usenet Newsgroups or web forums.) Your messages are

held for you on an e-mail server until you access them using you e-mail client software.

The World Wide Web is free-format a collection of data archives called web pages that include text, graphics, animation, sound, and video. Web pages are linked together using hypertext links (hyperlinks); simply clicking on a link displays another web page. All manner of information is available on the Web from individuals, businesses, universities, government bureaus, etc.

9. *Reproduce the text in English:*

Интернет (англ. Internet; Interconnected Networks – соединенные сети) – всемирная система объединенных компьютерных сетей, построенная на использовании протокола IP и маршрутизации пакетов данных. Интернет образует всемирную информационную среду – обитель оцифрованной информации, служит физической основой для Всемирной паутины.

Интернет состоит их многих тысяч корпоративных, научных, правительственных и домашних компьютерных сетей. Объединение сетей разной архитектуры и топологии стало возможно благодаря протоколу IP и принципу маршрутизации пакетов данных. Протокол IP был специально создан агностическим в отношении физических каналов связи. То есть любая система (сеть) передачи цифровых данных, проводная или беспроводная, может передавать и трафик Интернет. На стыках сетей специальные маршрутизаторы (программные или аппаратные) занимаются автоматической сортировкой и перенаправлением пакетов данных, исходя из IP-адресов получателей этих пакетов. Протокол IP образует единое адресное пространство в масштабах всего мира, но в каждой отдельной сети может существовать и собственное адресное подпространство, которое выбирается исходя их класса сети. Такая организация IP-адресов позволяет маршрутизаторам однозначно определять дальнейшее направление для каждого мельчайшего пакета данных. В результате между отдельными сетями Интернет не возникает конфликтов, и данные беспрепятственно и точно передаются из сети в сеть по всей планете и ближнему космосу.

## References

1. Радовель В.А. Английский язык. Основы компьютерной грамотности: учебное пособие.- Ростов н/Д: Феникс, 2011. – 219 с.
2. Бобылева С.В., Жаткин Д.Н. Английский язык для сферы информационных технологий и сервиса: учебное пособие.- Ростов н/Д: Феникс, 2009. – 332 с.
3. Santiago Remancha Esteras, Elena Marco Fabre. Professional English in Use, ICT, For computers and the Internet, Cambridge University Press, 2010.

## Contents

Unit 1. Personal computer	3
Unit 2. What is a microcomputer?	8
Unit 3. Input devices	15
Unit 4. Output devices	20
Unit 5. Processing	26
Unit 6. Operating systems	30
Unit 7. Programming	33
Unit 8. Networks	38
References	45

Светлана Борисовна Бухина

АНГЛИЙСКИЙ ЯЗЫК

Practical English for special purposes for students  
in Computer science

Методические указания для специальности

5В070400 - Вычислительная техника и программное обеспечение

Редактор А.Т. Сластихина

Специалист по стандартизации Н.К. Молдабекова

Подписано в печать \_\_\_\_\_

Формат 60x84 1/16

Тираж 50 экз.

Бумага типографская №1

Объем \_2.9\_уч. – изд. л.

Заказ\_\_\_\_\_.Цена\_\_290\_т.

Копировально-множительное бюро  
Некоммерческого акционерного общества  
«Алматинский университет энергетики и связи»  
050013, Алматы, Байтурсынова, 126