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ИНФОРМАЦИОННЫЕ ТЕХНОЛОГИИ

*МЕТОДИЧЕСКОЕ ПОСОБИЕ
ПО РАЗВИТИЮ НАВЫКОВ ЧТЕНИЯ И ГОВОРЕНИЯ
НА АНГЛИЙСКОМ ЯЗЫКЕ ДЛЯ СТУДЕНТОВ ФИТУ
ВСЕХ ФОРМ ОБУЧЕНИЯ*

***INFORMATION TECHNOLOGIES
TEACHING AID
FOR FULL AND PART TIME COMPUTER STUDENTS***

Минск БГУИР 2012

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Информационные технологии: метод. пособие по развитию навыков
чтения и говорения на английском языке для студентов ФИТиУ =
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В пособие вошли 8 разделов: Information and Information Technologies, Hardware, Software, Information Systems Analysis, Information Systems Design, Databases, Artificial Intelligence, Networks. В данных разделах авторами-составителями предложены оригинальные тексты по тематике информационных технологий, а также специально созданный комплекс упражнений, которые нацелены на развитие и совершенствование навыков изучающего и поискового чтения. В каждом разделе представлены задания, направленные на реализацию речевого намерения в ситуациях общения по специальности.

Пособие соответствует типовой программе по иностранным языкам для неязыковых вузов и предназначено для студентов первой и второй ступеней всех форм обучения.

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UNIT I: INFORMATION AND INFORMATION TECHNOLOGIES

Active vocabulary

1. Accuracy (n) – точность, правильность	11. Interpret (v) – толковать, истолковывать
2. Complete (adj) – полный	12. Obtain (v) – получать, добывать
3. Convey (v) – передавать	13. Output (n,v) – вывод; выводить
4. Create (v) – создавать	14. Perform (v) – выполнять
5. Current (adj) – текущий	15. Process (v) – обрабатывать
6. Data (n) – данные	16. Relevance (n) – уместность, актуальность
7. Device – устройство	17. Store (v) – хранить
8. Define (v) – определять	18. Support (v) – поддерживать, содействовать
9. Display (v) – показывать	19. Timely (adj) – своевременный
10. Input (n, v) – ввод; вводить	20. Up to date (adj) – современный, новейший

Text A: Information

To understand the nature of information and what it is, you must understand another term – data.

Data are any raw facts or observations that describe a particular phenomenon. For example, the current temperature, the cost of a part, and your age are all data.

Information is simply data that has a particular meaning within a specific context. For example, if you are trying to decide what to wear, the current temperature is information because it is necessary to your decision what to wear.

Information may be data that have been processed in some way. Processing is a series of actions or operations that convert input into output. When we speak of data processing, the input is data, the output is useful information. So, data processing is a series of actions or operations that converts data into useful information.

The interchange of the words data and information is widespread, so the differences between them are:

Data: - Facts, statistics used for reference or analysis.

- Numbers, characters, symbols, images that can be processed by a computer.
- Data must be interpreted, by a human or machine, to derive meaning.
- «Data is a representation of information»

Information: - Knowledge derived from study, experience or instructions.

- Communication of intelligence.
- Information is any kind of knowledge that is exchangeable among people, about things, facts.
- «Information is interpreted data»

1. Read the questions and circle the correct answer.

1. What is the raw material?
a) information; b) number; c) data
2. What is used for reference or analysis?
a) data; b) people; c) information
3. What is information?
a) storage; b) output; c) input
4. What is knowledge?
a) data; b) computer; c) information
5. What converts data into information?
a) storage; b) processing; c) output

2. Match the words with their synonyms.

1) to derive from; 2) particular; 3) intelligence; 4) to process; 5) data; 6) up to date; 7) to interpret
a) cleverness; b) facts or numbers; c) to understand; d) certain; e) modern, new, up to now; f) to come from; h) to deal with

3. Read the sentences choosing the correct word in bold type.

1. Data is processed to become **useful/useless** information.
2. **Processing/storing** is a series of operations converting input into output.
3. System model shows that **data/information** goes into a process.
4. Data are a collection of facts that can be processed by a **person/computer**.
5. We use the term **data processing/data file** to include the resources applied for processing of information.
6. Information is **raw/meaningful** material.

4. Give the Russian equivalents.

1) the nature of information; 2) to describe a phenomenon; 3) meaning within a specific context; 4) to convert input into output; 5) a series of actions; 6) to derive from experience; 7) communication of intelligence
--

5. Find the answers to the questions.

1. How do data differ from information?
2. Give the examples of data and information.
3. What is data processing?
4. What is input/output?
5. What is the definition of data/information?

Text B: Characteristics of useful information

What makes certain information highly valuable and other information completely worthless? There are three dimensions of information – time, content, and form. Using these three dimensions, you can define the characteristics of information that has value to you.

The time dimension of information deals with the «when» aspect of information. Time characteristics of information include: timeliness and currency. Timeliness means having information when you need it. If you do not have the right time, it is almost impossible to make the right decision. Currency means having the most recent or up-to-date information.

Content deals with the «what» aspect of information, and its characteristics include accuracy, relevance and completeness. The accuracy characteristics of information specifies that the information you receive is information that has been processed correctly, it is free of errors. The relevance and completeness characteristics of information go hand in hand. That is, you should receive only information that is relevant to your task, useful to what you are trying to do (relevance) and you should receive all the information you need, it completely details what you want to know (completeness).

The last dimension of information is form, which deals with the « how» aspect of information. Form characteristics of information include detail and presentation. The detail characteristic of information deals with receiving information that either summarizes or details information at the appropriate level. Presentation means that information is provided in the most appropriate form – narrative, graphics, color, print, video, sound, and so on.

1. Mark the following statements as True or False.

1. Time, content and form are the dimensions of data.
2. Information received too late is relevant.
3. The information must be current as a fact of yesterday may not be a fact of today.
4. The information must be accurate as inaccurate information would lead to many different major problems.
5. Information should contain only one detail required by the user.

2. Put the letters in the following words into the correct order.

1) cacaruyc; 2) elearnvec; 3) ryruncce; 4) tetoncn; 5) ifimatonorn; 6) midisenon
--

3. Fill in the blanks choosing from the variants given.

1. ... means having information when you need it.
a) completeness; b) timeliness; c) relevance

2. If you don't know who writes any material, you cannot be sure that the information is
a) reliable; b) timely; c) concise
3. Information should be in a form that is ... enough to allow for its examination and use.
a) long; b) up to date; c) short
4. A marketing report that includes graphs of statistics is
a) concise; b) timely; c) relevant
5. Information should be ... to the purpose for which it is required.
a) concise; b) long; c) relevant
6. ... means that information is provided in the most appropriate form.
a) currency; b) presentation; c) accuracy

4. Give the English equivalents.

1) измерение информации; 2) последняя (новейшая) информация;
3) обрабатывать без ошибок; 4) соответствующий задаче; 5) представлять в наиболее подходящей форме; 6) резюмировать или подробно описывать информацию

5. Find the answers to the questions.

1. What are the dimensions of information?
2. What is the «when» aspect of information?
3. What are content characteristics?
4. What does «accurate information» mean?
5. What does «presentation» mean?

Text C: Information technology

Information Technology, or IT, has only been a part of business and industry for about 50 years. But if we look back into the 1960s, the term Information Technology was only used to describe the process of storing information. Now IT is one of the most important resources in today's business and successful companies invest a lot of money in IT.

Formally, Information Technology could be defined as any computer-based tool that people use to work with information and support the information and information-processing needs for an organization. IT includes keyboard, screen, mouse, modem, printer, word processing software and operating system software.

There is a separate IT department in almost all big organizations. They use IT in three ways:

1. To support information-processing task such as creating presentations, Web sites.

2. To enable innovations: IT gives the possibility to develop a more efficient way to handle the information-processing task related to delivering packages.

3. To reduce time and space: IT allows organizations to store huge amount of information in one small space and to use less time to process and send it.

But it should be mentioned that IT plays a major role not only in business but also in the personal life of millions of people. We can now connect to our friends and relatives in just a few minutes. All this has become possible because of the amazing features of IT.

1. Link the beginning and the end of the sentence.

1. Today almost all big companies	a) to handle the information-processing task.
2. The term Information Technology	b) we need to send information.
3. We can connect to our friends	c) have a separate IT department.
4. IT allows us to reduce the time	d) started to be used in the 1960s.
5. Using IT we can develop the best way	e) with the help of IT.

2. Find the words with a similar meaning in the text.

a) determine; b) minimize; c) produce ; d) vast; e) area; f) manage; g) keep

3. Complete these sentences using a noun or a verb from the box.

a) store; b) tool; c) support; d) process; e) resources; f) information

1. Nowadays IT is one of the most important ... in today's business.

2. IT is used to ... information-processing tasks.

3. Organizations use IT to reduce the time it takes to ... information.

4. IT helps businesses to ... huge amount of information in one small space.

5. In the 1960s the term IT was used to describe the process of storing

6. We can define IT as any computer-based ... that is used to work with information.

4. Find the terms to the given definitions.

1. Computer programs that assist the user in producing documents.

2. The branch of an organization that uses computers and other digital devices to process and manage information.

3. An input device that allows the user to manipulate objects on the screen.

4. The software that controls the computer's use of its hardware resources.

5. The device that changes the characteristics of a digital signal into an analog one.

5. Answer the questions.

1. When did IT appear in business and industry?
2. What does IT include?
3. What are the three main ways of using IT?
4. Why do companies invest money in IT?
5. What role does IT play in your life?

Text D: Categories of information-processing tasks

As we have already learnt, companies and businesses use Information Technology (IT) to do information-processing tasks. These tasks range from computing and printing checks to creating the site from which customers can order products. Because IT is a set of tools for working with information, we can easily categorize different IT tools according to what information-processing tasks we have to perform. In general, there are five categories of information-processing tasks:

-*Obtaining information.* We get information at its point of origin by using different input devices, such as mouse, keyboard.

-*Conveying information.* The information is presented in its most useful form with the help of screen, printer and other output and display devices.

-*Creating information.* We process information using, for example, word processing software.

-*Storing information.* Using different storage technologies, the information is stored for use at a later time.

-*Communicating information.* We send information to other people or to another location with the help of telecommunication technologies.

It's possible to look at each of these information-processing tasks separately but finally we'll have to combine them to create a system that performs all the tasks. Performing of any particular task-- finance, marketing and management -- always involves these five information-processing tasks.

1. Agree or disagree with the following statement.

1. IT is a set of tools for working with information.
2. There are four categories of information-processing tasks.
3. It is possible to work with the categories of information-processing tasks only separately.
4. Keyboard is an input device that helps to obtain information.
5. IT tools help professionals to make their work more efficient.

2. Find the words with an opposite meaning in the text.

a) divide; b) together; c) useless ; d) destroy; e) get; f) hide; g) input
--

3. Complete the sentences using active vocabulary.

- a) IT tools are used to ... different tasks.
- b) We ... information using different input devices.
- c) It's necessary to ... all the information-processing tasks to... a system that executes all the tasks.
- d) Any raw facts or observations are called
- e) To...information we need to have output and display devices.
- f) Having the most recent or up-to-date information means that this information is

4. Read the sentences translating the Russian fragments into English.

- 1. (Передача информации) it is one of the categories of information-processing tasks.
- 2. Using different storage technologies the information (сохраняется) to be used for a later time.
- 3. Organizations and companies use IT to do (задачи по обработке информации).
- 4. To obtain information we use different (устройства ввода).
- 5. Information must be (точной and своевременной).
- 6. (Обработка данных) is a series of actions that converts data into useful information.

5. Answer the questions.

- 1. How many categories of information-processing tasks do you know?
- 2. Are these tasks used separately or all together?
- 3. What is IT?
- 4. What is information?
- 5. What is "conveying information"?

SPEAKING PRACTICE

Speak on the following topics.

- 1. The differences between data and information.
- 2. Characteristics of information.
- 3. Information technology; three ways of using IT.
- 4. Different categories of information-processing tasks.

UNIT II: COMPUTER HARDWARE

Active Vocabulary

1. Accomplish – совершать, выполнять	11. Means – средство; способ
2. Area – область, участок	12. Predetermined – заранее установленный
3. Available – доступный; имеющийся в распоряжении,	13. Provide – предоставлять; обеспечивать
4. Bus – шина; канал	14. Pulse – импульс
5. Capacity – ёмкость; пропускная способность	15. Rate – скорость; частота
6. Circuit – схема; цепь; контур	16. Resolution – разрешение, разрешающая способность
7. Clock/computer clock – тактовый генератор	17. Retrieve – извлекать (хранимую) информацию
8. Digital – цифровой; дискретный	18. Transfer – передавать; пересылать
9. Execute – осуществлять, выполнять	19. Via – посредством (ч-л.), с помощью
10. Increase – возрастать, увеличивать	

Text A: Computer Information System Hardware

Hardware includes any machinery (now digital) that assists in the input, processing, storage and output activities of an information system. The distinguishing feature of a computer is its ability to store its own instructions. This ability makes it possible for a computer to perform many operations: to repeat its operations, store the results of its calculations for later use, make logical decisions, compare results with other data, and on the basis of such comparisons change the series of operation it performs. The computer can process, store, and retrieve data without human intervention.

Computer system hardware includes the central processing unit (CPU), input devices, output devices, communications devices, primary and secondary storage devices. Each central processing unit (CPU) includes: the arithmetic/logic unit, the control unit, the register areas, basic I/O devices. Since the mid-1970s CPUs have typically been constructed on a single integrated circuit called a microprocessor. The arithmetic/logic unit (ALU) performs mathematical calculations and makes logical comparisons. The control unit sequentially accesses program instructions, decodes them, and coordinates the flow of data in and out of the ALU, the registers, primary storage, secondary storage and various output devices. Registers are high-speed storage areas used to temporarily hold small units of program instructions and data immediately before, during and after execution by the CPU. Primary storage, also called main memory or just memory holds program instructions and data immediately before or immediately after the registers. The various circuits processing data in the computer's interior must operate in a highly synchronized manner; this is accomplished by controlling them with a very stable oscillator, which acts as the

computer's "clock". The CPU produces a series of electronic pulses at a predetermined rate, called the clock speed, which affects machine cycle time. Clock speed is measured in megahertz, where one hertz means one cycle or pulse per second. Computer clock rates may range from several million cycles per second to several hundred million or even a billion cycles per second.

1. Read the questions and circle the correct answer.

1. A computer is an electronic device that computes, so what makes a computer different from other electronic devices?
a) ability to process data; b) ability to store its own instructions; c) ability to repeat operations
2. What operations does the ALU execute?
a) retrieves instructions ; b) makes logical comparisons; c) temporarily stores data;
3. How does a computer know what operation to perform?
a) using its instructions ; b) asking for advice; c) just carrying out calculations
4. What are registers?
a) units of instructions; b) logical comparisons operations; c) high-speed storage areas
5. Clock speed is measured in
a) bytes b) (mega)hertz c) meters d) bits

2. Match the words with their synonyms.

1) distinguish; 2) calculation; 3) execute; 4) area; 5) via; 6) affect; 7) operate; 8) pulse
a) by means of; b) mark out; c) room, space; d) (о машине) run; e) fulfill; f) computation; g) influence, impact

3. Read the sentences choosing the correct word in bold type.

1. A computer is an electronic device that helps with processing data.
2. Mathematical calculations are fulfilled in the ALU.
3. Machine cycle time is influenced by the clock oscillator rate.
4. The clock oscillator generates electronic pulses at a predetermined speed.
5. The control unit accesses program instructions one by one.

4. Give the Russian equivalents.

1) retrieve; 2) various; 3) range; 4) control; 5) accomplish; 6) various; 7) computer clock

5. Find the answers to the questions.

1. What component of the computer accomplishes logical comparisons?
2. Where are programs held before they get to the registers?
3. Is a CPU a peripheral device?
4. Where are mathematical computations and logical comparisons executed?
5. Where is data held just before it is processed?

Text B: Data Processing Means

The CPU and memory – are both housed together in the same box, called the system unit. All other computer system devices are linked into the system unit housing. The execution of any machine-level instruction involves two phases: the instruction phase and the execution phase. The results are stored in registers or memory. After both phases have been completed for one instruction, they are again performed for the second instruction, and so on. The instruction phase followed by the execution phase is called a machine cycle. Machine cycle times are measured in microseconds or in terms of how many instructions are executed in a second. Today's central processing units speed up processing by using pipelining, when the CPU gets one instruction, decodes another, and executes a third at the same time.

Data is moved within a computer system in a group of bits. A bit (b) is a binary digit– 0 or 1. The processing speed is the number of bits the CPU can process at any one time. This number of bits is called the word length of the CPU. The larger word length increases the speed of processing. Each CPU produces a series of electronic pulses at a predetermined rate, called the clock speed, which affects machine cycle time. Clock speed is often measured in megahertz (where one hertz means one cycle or pulse per second).

Data is transferred from the CPU to other system components via bus lines the physical wiring that connects the computer system components. The number of bites a bus line can transfer any time is known as bus line width. Bus line width should be matched with CPU word length for optimal system performance. The larger is word length, the more powerful is the computer. Most CPUs are collections of digital circuits imprinted on silicon wafers, or chips. Reducing the distance between the points of destination on chips increases the speed of processing. Chips built from less resistant superconductive metals also increase processing speed.

1. Mark the following statements as true or false.

1. The system unit holds the CPU and I/O devices.
2. The instruction phase and the execution phase of a machine instruction are performed simultaneously.
3. The CPU performance is decreased by using pipelining.

4. Transferring data from the CPU to other system components involves using bus lines.
5. The word length of the CPU affects the computer performance.

2. Put the letters in the following words into the correct order.

- a) aefnrst; b)eeiilnpp; c) deghlnortw; d)acefft; e) acemopr;
f) tciriuc; g) cudcteinoprsvue

3. Fill in the blanks choosing from the variants given.

1. The instruction to be executed is ... from memory by the control unit.
a) affected; b) linked; c) retrieved; d) involved
2. Relevant data is ... from memory to the register storage area.
a) built; b) transferred; c) processed; d) decoded
3. The instruction is decoded so the central processor can understand what is to be ...
a) executed; b) accessed; c) held; d) followed
4. After both phases have been ... for one instruction, they are again executed for the second instruction.
a) decoded; b) moved; c) measured; d) accomplished
5. Pipelining ... the speed of processing.
a) produces; b) increases; c) decreases; d) affects
6. The clock speed is a series of electronic pulses produces by the oscillator at a predetermined
a) rate; b) power; c) length; d) connection

4. Give the English equivalents.

1) посредством (чего-л.); 2) заранее установленный; 3) мощный; 4) скорость; частота; 5) шина, 6) уменьшать; сокращать; 7) конвейерная обработка информации)

5. Find the answers to the questions.

1. In what form is data transferred between the components of the computer?
2. What means are used to move data from the central processor to other system components?
3. What does the word length of the CPU specify?
4. How can the performance of the CPU be increased?
5. What is a machine cycle?

Text C: Data Storage Devices

Data storage devices may be used either as a memory or as a secondary storage device. In most cases, storage capacity is measured in bytes, with one byte (B) usually equal to one character.

Primary storage is the memory part of the computer itself. It includes RAM and ROM. Random access memory (RAM) chips are mounted directly on the computer's main circuit board. RAM is temporary and volatile. It is used to store instructions and data temporarily. Read-only memory (ROM) – is usually nonvolatile. ROM provides permanent storage for data and instructions that do not change, like programs and data from the computer manufacturer. In a PC, the ROM contains a specialized program called the BIOS that controls loading the computer's operating system from the hard disk drive into RAM whenever the computer is turned on.

The CPU contains a special set of memory cells called registers that perform much more rapidly than the main memory area. Registers are used for the most frequently needed data items.

Cache memory is a type of high-speed memory that a processor can access more rapidly than main memory. A cache controller determines how often the data is used, transfers frequently used data to cache memory, and deletes the data when it goes out of use.

Programs and data that are not currently being used in main storage can be saved on secondary storage. The secondary storage is non-volatile and has greater capacity. Secondary storage devices include: internal and external hard drives, CDs, DVDs, flash memory, USB flash drives, etc. The hard drives are one of the most important of the secondary data storage devices. "Flash drive" is a solid state drive technology that stores data like a typical hard drive found in most PCs, but uses no moving parts. Flash drives come in many forms. For example, a USB flash drive – a very small, very portable storage device which can be plugged into a computer system via a USB port and used immediately. Installing operating system (thin clients) on this device allows one to plug this device in any computer without interfering with any of the data on the host computer.

1. Link the beginning and the end of the sentence.

1. The data is stored in memory	a) to represent a character.
2. To decrease access time	b) the CPU can retrieve the desired data and instructions faster.
3. Usually eight bits are used	c) that are sensitive to changes in electric current.
4. RAM chips consist of millions of switches	d) memory is located close to the CPU.
5. Because there is less data in cache memory than in main memory,	e) by representing data as a combination of "on" and "off" circuit states.

2. Find the words with a similar meaning in the text.

1) circuit card; 2) constant; 3) hold; 4) specified; 5) fast; 6) space; 7) employed; 8) transient
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3. Complete these sentences using a noun or a verb from the box.

a) provides; b) deletes; c) required; d) drive; e) rate; f) capacity; g) operates

1. Storage ... is measured in bytes.
2. Optical storage ... a convenient way to transfer data from one computer to another.
3. Access ... of the memory is the time required to get access to the memory.
4. In imbedded computers, all of the ... software may be stored in ROM.
5. Cache memory... somewhat like a notebook used to record phone numbers.
6. A cache controller ... the data when it is not currently being used.
7. Thin client operating system installed on the USB flash ... allows to use it on any computer.

4. Find the terms to the given definitions.

1	a tiny wafer of semiconductor material, such as silicon, processed to form a type of integrated circuit or component such as a transistor
2	the number of words or characters that can be stored in a particular storage device
3	an electronic circuit in which certain components and the connections between them are formed by etching a metallic coating
4	a group of electrical conductors at a low voltage, used for carrying data in binary form between the various parts of a computer or its peripherals
5	a small area of memory in a computer that can be accessed very quickly
6	representing data as a series of numerical values

5. Answer the questions.

1. How are storage devices classified?
2. What kind of storage constitutes the memory part of the computer?
3. Where is the BIOS program held?
4. What is the function of the cache controller?

Text D: Input and Output Devices

Data are entered into the computer and the processed data made available via input/output devices. I/O devices are the means by which a computer exchanges

information with the outside world. Placing data into the computer system requires converting it from human-readable to machine-readable data. Data is thus placed in a computer system in a two-stage process: data entry converts human-readable data into machine-readable form; data input then transfers it to the computer.

Devices that provide input to or output of the computer are called peripherals. The most common peripheral devices used for entry and input of data such as characters, text, and basic commands include a keyboard and a computer mouse and output devices such as a display and printer. Scanners are input devices that convert images and text into binary digits. Terminals perform data entry and data input at the same time. They transfer the data to the processing section of the computer system. Point-of-sale (POS) devices are terminals with scanners that read and enter codes into computer systems. Voice-recognition devices can recognize human speech. Source data automation involves automating data entry and input so that data is captured close to its source and in a form that can be input correctly to the computer. Automated teller machines (ATMs) are terminals with keyboards used for transactions. Touch-sensitive screens can function both as input and output devices.

Output devices provide information in different forms, from hard copy to sound in digital format. Display monitors are standard output devices; monitor quality is determined by size, color, and resolution. Display monitors can be in the form of CRT, LCD, plasma and LED monitors. Other output devices include printers, plotters, speakers, etc. Printers are popular hard-copy output devices whose quality is measured by speed and resolution. All auxiliary (secondary) storage devices are used as input/output devices. Computer networking is another form of I/O. In fact, I/O devices are often complex computers, with their own CPU and memory.

1. Agree or disagree with the following statement.

1. Data is entered into the computer and the processed data is made available via input/output devices.
2. A keyboard is a device used for entry and input images.
3. Scanners convert images and text into sound in digital format.
4. The CPU is a peripheral device.
5. To make data available to humans the computer converts it into machine-readable form.

2. Find the words with an opposite meaning in the text.

1) inside; 2) unique; 3) exclude; 4) wrong; 5) similar; 6) peculiar; 7) release

3. Complete the sentences using active vocabulary.

1. Using the ALU, a microprocessor can ... mathematical operations.
2. Touch-sensitive screens are ... to exchange information between a computer and a

human being.

3. A ...computer provides processing data in numerical form.
4. The computer can ... data without human intervention.
5. Printers are one of the most popular output devices ... for personal computers.
6. Printers differ in ... speed, duty cycle, operating costs and memory.

4. Read the sentences translating the Russian fragments into English.

1. (Разрешение принтера) is measured by the number of dots printed per linear inch.
2. The computer's main circuit board holds all essential chips and (обеспечивает) connecting circuitry between them.
3. A microprocessor is a very complex (интегральная схема).
4. Data (скорость передачи данных) is the amount of data a storage device can transfer per second from the storage medium to the computer.
5. Usually (ёмкость запоминающего устройства) is measured in bytes.
6. (Тактовый генератор) produces a series of electronic pulses at a predetermined rate, called the clock speed.
7. Clock speed is measured in megahertz, where one hertz means one cycle or (импульс) per second.

6. Answer the questions.

1. How can a human being communicate with a computer?
2. How is data placed into the computer system?
3. What are the most common peripherals
4. What does the computer system hardware contain?
5. What is the word length of the CPU?

SPEAKING PRACTICE

Speak on the following topics.

1. What makes a computer different from other computing devices?
2. How can the processing speed of the computer be increased?
3. Why does a computer need secondary storage if it has primary storage?
4. Why is it necessary to convert data from human-readable to machine-readable form?

UNIT III: COMPUTER SOFTWARE

Active vocabulary

Application software	Прикладное ПО
Copyright	Авторское право
Database	База данных
Distribution	Распространение
High-level language	Язык высокого уровня
Install	Устанавливать/ инсталлировать
Kernel	ядро
Multiuser operating system	Многопользовательская операционная система
Object code	Объектный код/ код программы
Properties	Свойства/характеристики
Service pack	Пакет обновления
Setup program	Программа начальной установки
Software license	Лицензия на ПО
Software suite	Программный пакет
Spreadsheet	Электронная таблица
System software	Системное ПО
Utility software	Сервисное/ обслуживающее ПО
Validation code	Код ратификации/ утверждения
What-if analysis	Прогнозирование/ анализ “что если”
Zipped file	Архивный файл

Text A: Software basics

Computer software consists of computer programs and data files that work together to provide a computer with the instructions and data necessary for carrying out specific type of task, such as document production, video editing, graphic design, or Web browsing. It is important to remember that computer software consists of many files that contain user-executable programs, support programs and data files. Computer **programmers** write the programs that become the components of a computer software product. To understand how software is installed and uninstalled, it is important for computer owners to recognize that today's software typically consists of many files.

To create a computer environment, a programmer must define the **properties** for each element in the environment, such as where an object appears, its shape, its color, and its behavior. A computer **programming language** provides the tools a programmer uses to create software. Most programmers today prefer to use **high-level languages**, such as C++, Java, Visual Basic. A computer microprocessor understands only **machine language**, however, so a program that is written in a high-

level language must be compiled or interpreted before it can be processed. A **compiler** translates all the instructions in a program as a single batch, and the resulting machine language instructions, called **object code**, are placed in a new file. An alternative method of translation uses an **interpreter** to translate instructions one at a time while the program runs.

Software is categorized as **application software** and **system software**. The primary purpose of application software is to help people carry out tasks using a computer. In contrast, the primary purpose of system software – your computer's operating system, device drivers, programming languages, and utilities – is to help the computer carry out its basic operating functions.

1. Read the questions and circle the correct answer.

1. What language does a computer's microprocessor understand?
a) high-level language; b) low-level language; c) machine language
2. Which of the following converts one computer instruction at a time into machine language while the program is running?
a) compiler; b) interpreter; c) translator; d) none of the above
3. What files does computer software typically consist of?
a) user-executable program; b) support program; c) data file; d) all of the above
4. What must a programmer define to create a software environment?
a) elements; b) properties; c) features; d) details
5. What provides the tools a programmer uses to create software?
a) source code; b) object code; c) programming language; d) all of the above

2. Match the words with their synonyms.

1) to carry out; 2) to create; 3) a purpose; 4) to install; 5) data; 6) to consist of; 7) to define; 8) a feature
a) information; b) to contain; c) to execute; d) to set up; e) to design; f) aim; g) to specify; h) a property

3. Read the sentences choosing the correct word in bold.

1. The instructions that tell a computer how to carry out a task are referred to as a computer **program/software**.
2. The main executable file provides the primary set of **instructions/ utilities** for the computer to execute and calls various support programs and data files as needed.
3. Software includes menus, buttons, and other controls that are defined by a **programmer/ user**.
4. A simple instruction to add two numbers becomes a long series of 0s and 1s in **machine/ high-level language**.
5. The main executable file loads into **RAM/ ROM** when the program runs.

4. Give the Russian equivalents.

1) Web browsing; 2) document production; 3) computer environment;
4) as a single batch; 5) a utility; 6) a device driver; 7) application software;
8) system software; 9) to define properties

5. Find the answers to the questions.

1. What is software? What files are included in a typical software product?
2. Who creates computer software?
3. How does a programmer “write” software?
4. How does a computer process a program?
5. What are the differences between system software and application program?

Text B: Operating systems and utilities

A computer’s software is like a chain of command in an army. Application software tells the operating system what to do. The operating system tells the device drivers, the device drivers tell the hardware, and the hardware actually does the work. The operating system interacts with application software, device drivers, and hardware to manage a **computer’s resources**. In addition, many operating systems also influence the “look and feel” of your software, or what’s known as **user interface**.

The core part of an operating system is called the **kernel**. In addition to this core, many operating systems provide helpful tools, called **operating system utilities**, that you can use to control and customize your computer equipment and work environment. Operating systems are informally categorized and characterized using one or more of the following terms: A **single- user** operating system expects to deal with one set of input devices – those that can be controlled by one person at a time. A **multiuser** operating system is designed to deal with input, output, and processing requests from many users. A **network** operating system provides process and memory management services that allow two or more programs to run simultaneously. A desktop operating system is one that’s designed for a personal computer – either a desktop computer or notebook. Popular desktop operating systems include Windows XP/ 7/ Me and Mac OS. Popular network operating systems include Linux, UNIX, and Solaris. Operating systems for PDAs - Palm OS, Symbian OS - are typically smaller than PC operating systems and can fit in ROM.

1. Mark the following statements as True or False.

1. The operating system allocates a specific area of RAM for each program that is open and running.
2. The operating system’s small bootstrap program is stored in RAM.

3. Handheld devices, such as PDAs and smartphones typically feature multiuser operating system.
4. A desktop operating system, such as Windows, is designed for personal computers.
5. Utility software is a type of application software designed to perform a specialized task, such as system maintenance or security.

2. Put the letters in the following words into the correct order.

1) esroafwt; 2) yuttiil; 3) edceiv; 4) emgaan; 5) ndgeis; 6) trseequ;
7) ticnatre; 8) eicnatfer; 9) rmeuuslit

3. Fill in the blanks choosing from the variants given.

1. An operating system ... computer resources, such as RAM, storage space, peripherals.
a) allocates; b) manages; c) defines
2. To run more than one program at a time, the operating system must ... specific areas of RAM for each program.
a) allocate; b) install; c) store
3. A user interface is a combination of hardware and software that helps people and computers ... with each other.
a) control; b) display; c) communicate
4. WinZip, WinAce are third-party ... that offer a variety of compression options.
a) utility; b) system; c) technology
5. An operating system communicates with device drivers so that data can travel between the computer and peripheral resources.
a) roughly; b) primary; c) smoothly
6. The core part of an operating system is called its
a) RAM; b) core; c) kernel

4. Give the English equivalents.

1) однопользовательская операционная система; 2) устройство ввода;
3) рабочая среда; 4) программное обеспечение; 5) аппаратные средства;
6) ядро операционной системы; 7) модифицировать по заказу пользователя;
8) одновременно; 9) оборудование; 10) сервисная программа.

5. Find the answers to the questions.

1. What is an operating system? What does an operating system do?
2. What are utilities? What are the most popular ones?
3. Are different operating systems needed for different computing tasks?
4. What is the best-selling operating system?

5. Does an operating system affect the user interface? How?

Text C: Application Software

Document production software assists you with composing, editing, designing, printing, and electronically publishing documents. The three most popular types of document production software include word processing, desktop publishing, and Web authoring. **Spreadsheet** software is similar to a “smart” piece of paper that automatically adds up the columns of numbers you write on it. You can use it to make other calculations, too, based on simple equations that you write or more complex, built-in formulas. Because it is so easy to experiment with different numbers, this type of software is particularly useful for what-if analyses. **Database** software helps you store, find, organize, update, and report information stored in one or more tables. When two sets of records are related, database software allows you access data from both tables at the same time. **Graphics** software, including paint, photo editing, drawing, 3-D, and presentation software, is designed to help you create, manipulate, and print images.

Music and video editing software, educational and reference software, and entertainment software are the most popular categories of personal computer software. A **software suite** is a “bundled” collection of application software sold as a single package. For businesses, vertical market software is designed to automate specialized tasks in a specific market or business. Horizontal market software is generic software that can be used by just about any kind of business. Groupware is a type of horizontal market software designed to help several people collaborate on a single project using LAN or Internet connections.

1. Link the beginning and the ending of the sentence.

1. Various kinds of document production software provide tools for	a) establish relationships between different types of records.
2. Database software stores data as a series of records and allows you to	b) from encyclopedias to medical references, from map software to cookbooks and telephone books.
3. Reference software spans a wide range of applications -	c) entertainment software.
4. Computer games are the most popular type of	d) “word wrap”, a spelling checker.
5. Most document production software includes such features as	e) creating and formatting printed and web-based materials.

2. Find the words with a similar meaning in the text.

- | |
|--|
| 1) worksheet; 2) to modify; 3) helpful; 4) to refresh; 5) to keep;
6) to handle; 7) to work with others |
|--|

3. Complete the sentences using a noun or a verb from the box.

- | |
|---|
| a) music software; b) deal with; c) spelling checker;
d) educational software; e) transfers; f) edit |
|---|

1. ... helps you learn and practice new skills.
2. Most document production software includes a ...
3. You may not be a composer or musician to have a use for
4. CD ripper software ... files from an audio CD to your computer's hard disk.
5. Microsoft Word gives you the ability to create, spell-check, ... , format a document on the screen before printing it.
6. Spreadsheets are popular with accountants who ... calculations.

4. Find the terms to the given definitions.

1. Computer programs that assist the user in composing, editing, designing, and printing documents.
2. A numeric model of a real situation, presented in the form of a table.
3. A collection of individual applications sold as one package.
4. Computer programs designed to meet the needs of a specific market segment or industry.
5. The process of setting up a model in a spreadsheet and experimenting to see what happens when different values are entered.
6. Any computer program that can be used by many different kinds of businesses.

5. Find the answers to the questions.

1. How can your computer help you with your writing?
2. How does spreadsheet software work?
3. What is database software?
4. Do businesses use specialized software?
5. What is a software suite?

Text D: Buying and installing software

When you **install** software, the new software files are placed in the appropriate folders on your computer's hard disk, and then your computer performs any software or hardware configurations that are necessary to make sure the program is ready to run. The **executable** files and data files for the software are placed in the folder you

specify. Some **support** programs for the software, however, might be stored in different folders, such as Windows/ System. Windows software typically contains a **setup** program that guides you through the installation process.

To install application software from a **distribution** CD, simply place the CD in the drive and wait for the setup program to begin. The installation process is slightly different for application software that you download. Usually all the files needed for the new software are consolidated into one large file, which is **compressed** to decrease its size and reduce the download time. This large, downloaded file must be reconstituted, or **unzipped**, into the original collection of files as a step in the installation process. A self-installing executable file automatically unzips the downloaded file and starts the setup program. A self-executing **zip** file automatically unzips the software's files, but does not automatically start the set up program.

Free software updates include new versions, **patches**, and **service packs** that contain code to fix bugs and security vulnerabilities. Some updates require a **validation code**.

A **copyright** is a form of legal protection that grants the author of an original "work" the right to copy, distribute, sell, and modify that work, except under special circumstances described by copyright laws. A software **license** is a legal contract that defines the ways in which you may use a computer program. Licenses for commercial, shareware, freeware, open source, and public domain software provide consumers with different sets of rights pertaining to copying and distribution.

1. Agree or disagree with the following statements.

1. The files for downloaded software are usually zipped into one large compressed file.
2. System requirements specify the operating system and minimum hardware capacities required for software to work correctly.
3. Linux is an example of freeware.
4. Shareware is not copyrighted, making it available for use without restriction.
5. A software patch is a small collection of program code that replaces part of the software you currently have installed.

2. Find the words with an opposite meaning in the text.

1) to zip; 2) to stop; 3) commercial software; 4) to collect; 5) to increase;
6) to fail a program; 7) to buy; 8) to install; 9) to compress

3. Fill in the correct words from the active vocabulary.

1. Computer ... consists of many files that contain user-executable programs, support programs and data files.

2. A compiler converts ... instructions into a new file containing machine language instructions.
3. In recent years, antivirus software has become a popular category of .
4. The core part of OS called ... provides the most essential operating system services, such as memory management and file access.
5. ... software stores data as a series of records, which are composed of fields that hold data.
6. To combat piracy, many software publishers require users to type in a ... to complete an installation.

4. Read the sentences translating the Russian fragments into English.

1. Software publishers regularly (обновляют) their software to add new (свойства), fix bugs, and improve its security.
2. (Пакет обновления) is a set of patches that исправляет problems and security vulnerabilities.
3. (Общедоступное ПО) may be freely copied, distributed, even sold but you are not allowed to apply for a (авторское право) on it.
4. (Условно-бесплатное ПО) includes a license that (позволяет) you to use software for a trial period but if you choose to use it, you must pay a registration fee.
5. (Бесплатное ПО) permits you to use it, copy it, give it away but does not allow you to sell it or (вносить изменения) it.
6. (Открытое ПО) is available for programmers who want to (вносить поправки) and improve it.

5. Answer the questions.

1. How do you install software from distribution media?
2. Is the installation process different for downloaded software?
3. What is a software update?
4. What is a software license? Do you buy the software or licensing it?
5. Can you rent the software? Can you sell the software?

SPEAKING PRACTICE

Speak on the topics.

1. Explain the difference between a compiler and an interpreter. Describe the differences between system software and application software.
2. Describe the way an operating system manages each computer resource. Identify operating systems for personal computers, PDAs and servers.
3. List the key features and uses for document production software, spreadsheet and database software.
4. Explain how to install software, whether it's supplied on CDs or as a Web download. Describe the rights granted by copyright law.

UNIT IV: INFORMATION SYSTEMS ANALYSIS

Active vocabulary:

establish a plan – разработать план	feasibility study – технико-экономическое обоснование
scope of the system – область применения системы	a phase – фаза, стадия
inference – вывод, заключение	workability – применимость, годность
cost effectiveness – экономическая эффективность, экономичность	current system – существующая система
data store – информационный склад, хранилище данных	data dictionary – словарь данных
requirements – технические требования, запросы	questionnaire – анкета, вопросник
significance – значимость, важность, значение	system(s) analyst – специалист по системному анализу
accurate – верный, правильный, точный	trustworthy – достоверный, надёжный, заслуживающий доверия
relevant – уместный, подходящий, соответствующий	summarized information – итоговая информация
schedule – график, расписание, план	to liaise – поддерживать связь

Text A: System Life Cycle

System life cycle is an organizational process of developing and maintaining systems. It helps in establishing a system project plan, because it gives overall list of processes and sub-processes required developing a system. System development life cycle means combination of various activities. Following are the different phases of system (or software) development life cycle: system study, feasibility study, system analysis, system design, coding, testing, implementation, maintenance.

System Study gives a clear picture of what actually the physical system is. In practice, the system study is done in two phases. In the first phase, the preliminary survey of the system is done which helps in identifying the scope of the system. The second phase of the system study is more detailed and in-depth study in which the identification of user's requirements and the limitations and problems of the present system are studied. After completing the system study, a system proposal is prepared by the System Analyst and placed before the user. The proposed system contains the findings of the present system and recommendations to overcome the limitations and problems of the present system in the light of the user's requirements. System study phase passes through the following steps: problem identification and project initiation, background analysis, inference or findings.

Feasibility Study. The feasibility study is basically the test of the proposed system in the light of its workability, meeting user's requirements, effective use of

resources and the cost effectiveness. The main goal of feasibility study is not to solve the problem but to achieve the scope. In the process of feasibility study the cost and benefits are estimated with greater accuracy.

1. Read the questions and circle the correct answer.

1. What are the phases of a system development life cycle?
 - a) system study, feasibility study, system analysis and design
 - b) system analysis, system design, coding, testing
 - c) system study, feasibility study, system analysis, system design, coding, testing, implementation, maintenance
 - d) planning phase, analysis phase, design phase, implementation phase
2. What phases does the system study contain?
 - a) the preliminary survey and in-depth study of the present system
 - b) identification of the scope of the system and meeting user's requirements
 - c) assembling the project team, justifying a project
 - d) choosing development methodology, developing a project schedule
- 3) What are the steps in the system study phase?
 - a) problem identification, project initiation, background analysis
 - b) problem identification, project initiation, background analysis, inference
 - c) background analysis, producing a Project Development Plan
 - d) description of the project, estimation of the project costs and financial benefits
- 4) What does a system proposal include?
 - a) a short description of the project scope, a list of project team participants
 - b) findings of the present system and recommendations to overcome the limitations and problems of the present system
 - c) a schedule for the project, including an outline of its phases
 - d) analysis of information requirements, designing new information systems
- 5) What are the basic goals of the feasibility study?
 - a) meeting customer's requirements
 - b) effective use of resources, the cost effectiveness
 - c) achieving the scope
 - d) all of the above

2. Match the words with their synonyms.

1) establish; 2) implementation; 3) inference; 4) in-depth; 5) include; 6) investigation; 7) accuracy
a) accomplishment; b) exploration; c) involve; d) findings; e) set up; f) detailed; g) precision;

3. Read the sentences choosing the correct word in bold type.

- 1) A new information system is **designed/designated** to replace a system or process that is already in place.
- 2) To obtain **adding/additional** information about the current system, project team members can interview people who use the system or observe the system in action.
- 3) It is important to study the current system to understand its **strong/strengths** and **weaknesses/weak** before planning a new system.
- 4) The project team usually documents the current system **used to/using** diagrams.
- 5) A new or updated information system should meet the **requires/requirements** the project team defines.
- 6) The members of the project team can use a variety of techniques, such as interviews and data analysis, to **identical/identify/identification** problems and opportunities.

4. Give the Russian equivalents.

1) maintain a system; 2) establish a plan; 3) system study; 4) problem identification; 5) background analysis; 6) meet user's requirements; 7) preliminary survey

5. Find the answers to the questions.

- 1) How does System Life Cycle help in establishing a system project plan?
- 2) What activities does System Development Life Cycle involve?
- 3) What helps to identify the scope of the system?
- 4) Why is the second phase of the system study more detailed?
- 5) Who prepares a system proposal and when?
- 6) What kind of test is the feasibility study considered to be?

Text B: System Analysis

System analysis involves a detailed study of the current system, leading to specifications of a new system. Analysis is a detailed study of various operations performed by a system and their relationships within and outside the system. During analysis, data are collected on the available files, decision points and transactions handled by the present system. Interviews, on-site observation and questionnaire are the tools used for system analysis. Using the following steps it becomes easy to draw the exact boundary of the new system under consideration: a) keeping in view the problems and new requirements, b) workout the pros and cons including new areas of the system.

All procedures, requirements must be analysed and documented in the form of detailed data diagrams (DFDs), data dictionary, logical data structures and miniature specifications. System Analysis also includes sub-dividing of complex processes involving the entire system, identification of data store and manual processes.

The main points to be discussed in system analysis are:

- Specification of what the new system is to accomplish based on the user requirements.
- Functional hierarchy showing the functions to be performed by the new system and their relationships with each other.
- Function networks which are similar to function hierarchy but they highlight those functions which are common to more than one procedure.
- List of attributes of the entries — these are the data items which need to be held about each entry (record).

1. Mark the following statements as true or false.

- 1) System analysis involves an in-depth study of a new system, leading to specifications of the current system.
- 2) Questionnaire, interviews and on-site observation are the tools used for system analysis.
- 3) The project team usually document the current system using procedures and interviewing people.
- 4) The exact boundary of the new system can be drawn keeping in view the problems and new requirements, workout the pros and cons of the system.
- 5) The main issues to be considered in system analysis are: a) analysing the purpose of the information system, b) function networks which are different from function hierarchy.

1. Put the letters in the following words into the correct order.

- 1) cinafecisopit; 2) derpucore; 3) cehirhyar; 4) trequemirens; 5) abilavela;
- 6) ateuqinirsone; 7) fidicitanotine

2. Fill in the blanks choosing from the variants given.

- 1) The goal of the analysis phase is to ... a list of requirements for a new or revised information system.
a) produce; b) include; c) investigate
- 2) A new information system is designed to ... a system or process that is already in place.
a) examine; b) verify; c) replace
- 3) A new or updated information system should ... the requirements the project team defines.
a) answer; b) meet; c) satisfy
- 4) The project team can use a variety of ... to diagram the current system and specify what it does.
a) tools; b) media; c) instruments
- 5) A System Requirement Report describes the ... for a new information system.

a) ideas; b) innovations; c) objectives

6) System requirements are the criteria for successfully ... problems identified in an information system.

a) solving; b) deciding; c) deleting

4. Give the English equivalents.

1) детальное (подробное) исследование; 2) доводы за и против;
3) анкета (вопросник); 4) технические требования; 5) распознавание (идентификация); 6) подчеркивать (выделять, выдвигать на первый план);
7) существующая система

5. Find the answers to the questions.

1. What is System Analysis?

2. What steps are used to draw the exact border of the new system under consideration?

3. How must all procedures and requirements be analysed and documented?

4. What else does System Analysis include?

5. What are the main points to be discussed in system analysis?

Text C: Qualities of Information

Data and information are not synonymous. Information is processed data. Data may be processed by performing arithmetic operations on them. Data may also be processed by reorganizing them by applying appropriate rules such as sorting, merging, selection, matching, filtering, etc. Information requirements for managing organizations may be classified as strategic, tactical and operational.

Now we'll discuss the qualities of the information to be provided to managers.

- It must be **accurate**. Incorrect information is worse than no information.
- It should be **complete**. It should include all data and not exclude some.
- It should also be **trustworthy**. The processing should not hide some vital information which may point out the inefficiency of some individuals.
- The information should be **timely**. It should be given to the manager when he needs it. Delayed information may sometimes be of no value.
- It should also be **up to date**. It should include all data available at the time of processing.
- It should be tailored to the needs of the user and be **relevant** to him. Irrelevant information would waste a lot of manager's time.
- It is essential to give brief **summarized** information to ensure quick action.
- Information should be presented when a user needs it in such a way that he may immediately perceive its **significance**. It is essential to present the information in an attractive format which a user can immediately

understand.

1. Link the beginnings and the ends of the sentence.

1. Information is a collection of facts organized in such a way that	a) the source of the information.
2. The value of information is directly linked to	b) to be obtained in the right format and at the right time to meet their needs.
3. The reliability of the information depends on	c) they have additional value beyond the value of the facts themselves.
4. Information should be easily accessible by authorized users	d) poor decisions can be made, costing the organization thousands, or even millions of dollars.
5. If information is not accurate or complete,	e) how it helps decision makers achieve their organization's goals.

2. Find the words with a similar meaning in the text.

1) executing; 2) using; 3) exact (precise); 4) entire (full); 5) reliable;
6) meaning; 7) modern

3. Complete these sentences using a noun or a verb from the box.

a) make; b) be; c) process; d) decision; e) set up; f) distinguish

1. Several characteristics ... useful information from data.
2. The purpose of information is to help people ... well-informed decisions.
3. Information must be relevant, timely, accurate, concise and complete in order to ... useful.
4. Rules and relationships can be ... to organize data into useful, valuable information.
5. Turning data into information is a ... , or a set of logically related tasks performed to achieve a defined outcome.
6. If information is not pertinent to the situation, not delivered to ... makers in a timely fashion, or too complex to understand, it may be of little value to the organization.

4. Find the terms to the given definitions.

- 1) The symbols that a computer uses to represent facts and ideas.
- 2) The words, numbers, and graphics used as the basis for human actions and decisions.

- 3) Tasks performed by the project team whose goal is to produce a list of requirements for a new or revised information system.
- 4) A computer system that collects, stores, and processes information, usually within the context of an organization.
- 5) A computer professional responsible for analyzing requirements, designing information systems, and supervising the implementation of new information systems.

5. Answer the questions.

- 1) What is the difference between data and information?
- 2) Do you agree that data becomes information when it is presented in format that people can understand and use?
- 3) How may data be processed?
- 4) What makes information useful?
- 5) Do computer systems remain vulnerable to the entry by humans of invalid data?

Text D: System Analyst

Job description. A system analyst designs new IT solutions to improve business efficiency and productivity. Working closely with the client, analysts examine existing business models and flows of data, discuss their findings with the client, and design an appropriate improved IT solution. They produce outline designs and costings of new IT systems, specifying the operations the system will perform, and the way data will be viewed by the user, present their design to the client and, once it is approved, work closely with the client team to implement the solution.

Typical work activities. Work activities depend on specific type of IT system and the size and nature of the organization, but typically involve:

- liaising extensively with clients, presenting proposals to them;
- analyzing clients' existing systems;
- translating client requirements into highly specified project briefs;
- identifying options for potential solutions and assessing them;
- drawing up specific proposals for modified or replacement systems;
- producing project feasibility reports;
- working closely with developers and a variety of end users;
- ensuring that budgets are adhered to and deadlines met;
- drawing up a testing schedule for the complete system;
- overseeing the implementation of a new system;
- planning and working flexibly to a deadline;
- writing user manuals and providing training to users of a new system.

1. Agree or disagree with the following statements.

- 1) A system analyst investigates the requirements of a business or organization, its employees, and its customers in order to plan and implement new or improved computer services.
- 2) The job of a system analyst doesn't require the ability to identify problems and research technical solutions.
- 3) Good communication skills are essential for interacting with managers and other employees.
- 4) Depending on the organization and its size, he or she might also be called a systems consultant, a systems engineer, an information analyst, or a business analyst.
- 5) A system analyst doesn't have to determine which people and what kind of software, hardware, and monetary resources are necessary or available to solve the problem.

2. Find the words with an opposite meaning in the text.

1) destroy; 2) simple; 3) solution; 4) at a distance; 5) unsuitable; 6) deleting; 7) sometimes

3. Fill in the correct words from the active vocabulary.

- 1) ... is the study of an activity, a procedure, even an entire business, to determine what kind of computer system would make it more efficient.
- 2) ... gathers and analyzes the data necessary to develop the new application.
- 3) "A project team" is a group of people who are assigned to analyze and ... an information system.
- 4) An information system progresses through several ... as it is developed, used, and finally retired.
- 5) The justification for a new information system usually emerges from a serious problem with the ... system, a threat to the organization's success, or an opportunity to improve an organization's products or services through technology.
- 6) Computerized information system can become obsolete when the hardware is out of date, or when the software no longer meets the ... of the business mission.

4. Read the sentences translating the Russian fragments into English.

- 1) Computers often provide ways to make businesses run more efficiently, and they can supply (своевременную) information that helps improve customer service.
- 2) The members of the project team can use a variety of techniques, such as interviews and data analysis, (чтобы распознать) problems and opportunities.
- 3) The system development life cycle (SDLC) is the (основа) for creating computer systems.
- 4) The systems analyst's task is to (беседовать с) the people who will be using the system to determine their needs, problems, and expectations.
- 5) Data are a collection of facts – unorganized but able to be organized into (полезную информацию).

- 6) (План развития проекта) typically must be approved by the management before a project proceeds beyond the planning phase.

5. Answer the questions.

- 1) What data does a system analyst typically gather and analyze?
- 2) Does a system analyst analyze the problem to be solved, the data to be input, the expected output, and other system considerations? Why?
- 3) Why does a system analyst work closely with developers, and users, liaise extensively with clients?
- 4) Do you agree that a computer professional is any person whose primary occupation involves the design, configuration, analysis, development, modification, testing, or security of computer hardware or software? Why?
- 5) Do computer professionals work outside of Information Systems departments?

SPEAKING PRACTICE

Speak on the following topics.

- 1) What is a system development life cycle?
- 2) How does the project team discover what happens in the current system?
- 3) What qualities should information have in order to be useful?
- 4) Describe typical work activities of a system analyst.

UNIT 5: SYSTEM DESIGN

Active vocabulary

design (n,v) – проектирование; создавать	solution (n) - решение
to satisfy the requirements - удовлетворять требованиям	distributed processing - распределённая обработка данных
to define – определять, описывать	to evaluate – оценивать, анализировать
“from scratch” - “с нуля”, заново	turnkey system - готовая к эксплуатации система
customization (n) - настройка по техническим условиям заказчика	application development tools - средства разработки приложений
to implement - внедрять	compatibility (n) - совместимость
patch (n) - вставка в программу (корректировка)	shell (n) - оболочка операционной системы
maintenance (n) – сопровождение,	application specifications –

текущее обслуживание	технические требования к системе
backup (n,v) - резервные средства, резервировать	conversion software – программа преобразования данных
performance (n) - производительность системы	

Text A: System design. Hardware solutions

Systems design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. The activities that typically take place during the design phase for an information system are: identify potential solutions, evaluate and select the best, select hardware and software, develop application specifications and obtain approval to implement the new system.

There might be more than one way to solve the problems and meet the requirements. When evaluating hardware solutions for a new information system, the project team considers the overall architecture of the system based on level of automation, processing methodology, and network technology.

Some information systems provide a higher level of automation than others. The project team should consider the pros and cons of different levels of automation and computerization.

An information system can be designed for centralized processing, in which data is processed on a centrally located computer (usually a mainframe) or distributed processing, in which processing tasks are distributed to servers and workstations. Distributed processing is very popular because it provides high level of processing at a low cost but presents more security problems than a single, centralized computer. The project team must consider this factor too.

Every information system requires a network, so the project team must examine network alternatives, such as LANs, extranets, intranets, and the Internet.

1. Read the questions and circle the correct answer.

1. What must the project team figure out in the design phase?
a) what the new system must do; b) how it will fulfill the requirements
2. What hardware options for information systems are available?
a) mainframes, servers; b) personal computers; c) all of the above
3. Where is data processed in centralized processing?
a) on servers; b) workstations; c) on a centrally located computer
4. Why is distributed processing so popular?
a) it is cheap; b) presents higher security; c) requires powerful computer
5. Who is an information system designed to serve to?
a) a single user; b) an entire organization; c) all of the above

2. Match the words with their synonyms.

1) to figure out; 2) to evaluate; 3) to fulfill; 4) to specify; 5) to distribute
a) to identify; b) to understand; c) to deliver; d) to perform; e) to assess

3. Read the text choosing the correct word in bold type.

Automation alternatives can **affect/create** many aspects of an information system. For instance, point-of-sale system with low level of automation **employs/requires** the checkout clerk to enter credit cards numbers. And a credit card number can be **stored/ hold** using only a few bytes. At a higher level of automation, a magnetic strip reader **speeds up/ automates** the process of entering a credit card number. At a further level of automation a pressure-sensitive digitizing pad and stylus are used **to collect/to read** customer signatures. The entire transaction record becomes **automatic/electronic** and storing a digitized signature might require a special type of database software.

4. Give the Russian equivalents.

1) application specifications; 2) pros and cons; 3) digitized signature; 4) to obtain; 5) approval; 6) point-of-sale system; 7) strip reader; 8) pressure-sensitive pad
--

5. Find the answers to the questions.

1. What is system design?
2. What affects hardware solutions for a new information system?
3. How does a level of automation differ?
4. What processing methodologies are used?
5. Why does every information system require a network?

Text B: Software alternatives

During the design phase, the project team might consider different software alternatives, such as whether to construct the system “from scratch” in a programming language, use an application development tool, purchase commercial software, or select a turnkey system.

Creating an information system “from scratch” requires development time and expertise. It is also usually costly but offers the most flexibility for meeting the system requirements. The team also selects the programming language to use.

An application development tool contains building blocks that can be assembled into a software product. The application development tools include expert system shells and database management systems. An application development tool

help the programmers quickly and easily develop the modules for an information system, but it might limit the ways to implement some system features.

Commercial software for an information system is usually a series of preprogrammed software modules. Although it requires minimal development time, software features might not exactly match business needs. Commercial software is available for standard business functions, such as human resource management, accounting, for many market businesses and organizations.

A turnkey system consists of hardware and commercial software designed to offer a complete information system solution. It requires minimal effort to select and set up, but must be extensively evaluated to determine whether it can satisfy system requirements.

1. Mark the following statements as True or False.

1. Creating an information system “from scratch” using a programming language can take many months or years.
2. Application development tools might offer the same level of flexibility as a programming language.
3. Commercial software might require extensive customization.
4. Commercial software can be modified to meet every system requirements.
5. A turnkey system is essentially an “information system in a box”.

2. Put the letters in the following words into the correct order.

1) tolo; 2) sepurach; 3) yteflexibli; 4) chtascr; 5) rutneyk; 6) perextise; 7) fearetu
--

3. Fill in the blanks choosing from the variants given.

1. An information system “from scratch” can be exactly ... to system requirements.
a) tailored; b) downloaded; c) bought
2. An application development tool is a type of software construction ... containing building blocks that can be assembled into software product.
a) site; b) design; c) kit
3. Commercial software ... much of the design work required with programming languages or application development tools.
a) increases; b) eliminates; c) refuses
4. A turnkey system might seem like a quick and easy ... and it looks attractive to many project teams.
a) solution; b) purchase; c) project
5. The project team must decide if the benefits of commercial software can ... the cost and inconvenience of procedural changes.
a) add to; b) cut down; c) compensate

4. Give the English equivalents.

- 1) рассматривать различные варианты; 2) приобрести коммерческое ПО;
3) требовать профессиональных знаний; 4) предлагать наибольшую гибкость;
5) оболочки экспертных систем; 6) соответствовать потребностям бизнеса

5. Find the answers to the questions.

1. What software alternatives are available?
2. What are the pros and cons of creating a system “from scratch”?
3. What do application development tools include?
4. Why does commercial software require extensive evaluation?
5. Why does a turnkey system look so attractive to many project teams?

Text C: Evaluation and selection. Application specifications

To determine the best solution, the project team devises a list of criteria comparing each potential solution. This list includes general criteria related to costs, benefits, and development time. It also includes technical criteria such as the flexibility of the solution and its adaptability for future modifications. Finally, the list includes functional criteria that indicate how well the solution satisfies the specified requirements.

After the project team selects a solution, the next task is to select the hardware and software. The basis for choosing hardware and software includes general criteria, such as cost and delivery time. Technical criteria for hardware might include processing speed, reliability, upgradability, maintenance cost, and warranty. Technical criteria for software might include reliability, compatibility, and availability of patches to fix program errors.

Next step depends on the type of solution selected. If the project team selects a solution that requires programming, systems analysts will create a set of application specifications that describe the way the information system’s software should interact with users, store data, process data and format reports.

Application specifications are a key element in developing an effective information system. They are similar to the pages of the architectural blueprint that show the detailed plan for electrical wiring or plumbing. Not only do these specifications serve as a blueprint for the new system, but they ensure that the development process proceeds efficiently.

1. Link the beginning and the end of the sentence.

1. Sometimes the team knows exactly	a) to recommend hardware and software
2. At the other times, the team has a general understanding, but needs	for the solution.
	b) by constructing a decision table.

3. A project team asks a vendor	c) what brand, model or version of hardware and software are required.
4. A project teams sends a request for a formal price quotation	d) on a list of hardware and software.
5. The project team can evaluate the proposals and prices	e) vendor help selecting specific products.

2. Find the words with a similar meaning in the text.

1) to invent; 2) to choose; 3) accessibility; 4) to repair; 5) working (up); 6) plan; 7) to go on

3. Complete these sentences using a noun or a verb from the box.

a) specifications; b) given; c) selecting; d) criteria; e) expertise; f) vendor

1. The project team evaluates the ... for each solution.
2. Sometimes more than one ... sells the hardware and software.
3. Detailed application specifications can be developed only after ... the hardware and software for an information system.
4. It is important to change some ... during the development process.
5. In a large project, specifications are ... to a programming team, but in a small project, you as the user might develop your own specifications.
6. Then you might give the specifications to a programmer or, if you have the ... , you might create the software yourself.

4. Find the terms to the given definitions.

1) modification	a) a guarantee by the seller of property, a product, etc.
2) adaptability	b) means of support; keeping in proper condition
3) warranty	c) a slight change or improvement, as in form or function
4) maintenance	d) to raise to a higher rank, responsibility, value, importance
5) upgrade	e) the ability to modify (oneself) to an environment

5. Answer the questions.

1. How does the team choose the best solution?
2. How does the project team find the right hardware and software?
3. What happens after the project team selects a solution?
4. What is the importance of application specifications?
5. What happens to the completed specifications?

Text D: Implementation and maintenance

The tasks that take place during the implementation phase are: purchase and install hardware and/or software, create and test applications, finalize documentation,

convert to new system. When new hardware and software are purchased and installed, they are tested to ensure they operate correctly.

Different types of testing help identify and fix problems. As each application module is completed, it undergoes unit testing. When all modules are tested, integration testing is performed to ensure that the modules operate together correctly. After unit and integration testing are completed, system testing ensures that all hardware and software components work together correctly.

The information system should be completely documented. System documentation describes a system's features, hardware, and programming. User documentation describes how to interact with the system.

Implementation of a new system must include training employees. It might be software orientation, hardware operations, data entry and backup procedures.

The data for a new information system must be converted and loaded into the new system. System conversion is the process of deactivating an old information system and activating a new one. A final test called acceptance testing demonstrates that the system works correctly.

The maintenance phase involves day-to-day operation of the system, making modifications to improve performance, and correcting problems. It is the longest SDLC phase and lasts until the system is retired.

1. Agree or disagree with the following statements.

1. Testing is the only way to make sure a new information system works.
2. The target audience for user documentation is programmers, designers, and analysts who might maintain the system and implement modifications.
3. When converting data from an existing computer system to a new system, a programmer writes conversion software to read old data and convert it.
4. Acceptance testing includes the use of real data to demonstrate that the system operates correctly under normal and peak data loads.
5. During the maintenance phase, an information system is maintained in a static state and doesn't undergo any changes.

2. Find the words with an opposite meaning in the text.

1) to destroy; 2) solution; 3) to sell; 4) to begin; 5) improperly; 6) same; 7) to degrade
--

3. Fill in the correct words from the active vocabulary.

1. In the ... phase, the project team must figure out how the new system will fulfill the requirements specified in the System Requirements Report.
2. ... processing in a client/server or peer-to-peer environment is very popular because it provides high levels of processing power at a low cost.
3. Software ... is the process of modifying a commercial application to an organization's needs.
4. The goal of ... is to create very detailed specifications for the completed

information system.

5. Software testing can reveal problems that result from ... with the existing hardware or an incorrect installation of the software.

6. During the ... phase of the SDLC, the project team puts together the components for the new information system.

4. Read the sentences, translating the Russian fragments into English.

1. In the design phase, the project team (определяет различные решения) and then selects the one that offers the most benefits at the lowest cost.

2. (Настройка по техническим условиям заказчика может включать) modifying the user interface, enabling the mouse, selecting the menus.

3. Application development tools include (оболочки экспертных систем и системы управления базой данных).

4. The final phase of testing, in which users verify that the entire system works as specified, (называется приемочное тестирование).

5. (Без программы по преобразованию данных), users would be forced to manually reenter data from the old system into the new system.

6. (На этапе текущего обслуживания системы), security is a top priority, but operating system upgrades and software revisions also take place.

5. Answer the questions.

1. What happens during the implementation phase?

2. How can the team ensure that a new information system works?

3. What kinds of documentation does the project team create?

4. What happens to data from the old system?

5. What are the major maintenance activities for an information system?

SPEAKING PRACTICE

Speak on the following topics.

1. What happens in the design phase?

2. The pros and cons of different software alternatives.

3. Implementation phase: development and testing.

4. How long does the maintenance phase last?

UNIT 6: DATABASES

Active Vocabulary

Records- запись	Application- приложение
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Database management system (DBMS) –	система управления базами данных (СУБД)
Key- ключ	Domain- домен
Planned data redundancy- запланированная избыточность данных	Relationship- отношение
Two-dimensional- двумерный	Database design- структура базы данных
Entity- существо, сущность; нечто реально существующее.	Warehouse- склад, хранилище
Rely on- полагаться на	Implementation- выполнение, осуществление.
Arrange- приводить в порядок, располагать, классифицировать.	To fine-tune-
Alter- изменять, переделывать	Scalability- масштабируемость
Retrieve- 1) восстанавливать, исправлять 2) находить	

Text A: Data Modeling

Key considerations in organizing data in a database include determining what data is to be collected in the database, who will have access to it, and how they might wish to use the data. Based on these determinations, a database can then be created. Building a database requires two different types of designs: a logical design and a physical design.

The logical design of a database shows an abstract model of how the data should be structured and arranged to meet an organization's information needs. The logical design of a database involves an orderly fashion. Because databases provide both input and output for information systems throughout a business, users from all functional areas should assist in creating the logical design to ensure that their needs are identified and addressed.

Physical database design starts from the logical database design and fine-tunes it for performance and cost considerations (e.g. improved response time, reduced storage space, lower operating cost⁰). The person identified to fine-tune the physical design must have an in-depth knowledge of the DBMS to implement the database. For example, the logical database design may need to be altered so that certain data entities are combined, summary totals are carried in the data records rather than calculated from elemental data, and some data attributes are repeated in more than one data entity. These are examples of planned data redundancy. It is done to improve the system performance so that the user reports or queries can be created more quickly.

1. Read the questions and circle the correct answer.

1. How many types of design does building a database require?
a) two different types of designs; b) three different types of designs; c) only one type of design;
2. Who must have an in-depth knowledge of the DBMS to implement the database?
a) the person identified to fine-tune the logical design; b) the person identified to fine-tune the physical design; c) the person responsible to implement the logical design;
3. What does the logical design of a database involve?
a) an orderly fashion; b) modern fashion; c) structure fashion
4. Which users should assist in creating the logical design to ensure that their needs are identified and addressed?
a) programmers from all functional areas; b) users from all structural areas; c) users from all functional areas
5. What can improve the system performance?
a) scalability; b) planned data redundancy; c) creation of domain

2. Match the words with their synonyms.

data; 2) include; 3) model; 4) assist; 5) start; 6) alter; 7) calculate
count; b) information; c) change; d) involve; e) pattern; f) help; g) begin

2. Read the sentences choosing the correct word in bold type.

4. Give the Russian equivalents.

1) identifying relationships; 2) certain data entities; 3) improved response time; 4) lower operating cost; 5) reduced storage space; 6) key considerations; 7) to meet information needs

5. Find the answers to the questions:

1. What should one determine in organizing data in a database?
2. What does physical database design start from?
3. What does the logical design of a database show?
4. Why may the logical database design need to be altered?
5. What must the person identified to fine-tune the physical design have?

Text B: Database Models

The structure of the relationships in most databases follows one of three logical models: hierarchical, network, and relational. Hierarchical and network models are still being used today, but relational models are the most popular. It is important to

remember that the records represented in the models are actually linked or related logically to one another. These links dictate the way users can access data with application programs. Because the different models involve different links between data, each model has unique advantages and disadvantages.

Relational models have become the most popular database models, and use of these models will increase in the future. The relational model describes data using a standard tabular format. In a database structured according to the relational model, all data elements are placed in two-dimensional tables, called relations, which are the logical equivalent of files. The tables in relational databases organize data in rows and columns, simplifying data access and manipulation. It is normally easier for managers to understand the relational model than the hierarchical and network models.

In the relational model, each row of table represents a data entity, with the columns of the table representing attributes. Each attribute can take on only certain values. The allowable values for these attributes are called the domain. The domain for a particular attribute indicates what values can be placed in each of the columns of the relational table.

1. Mark the following statements as true or false.

1. The structure of the relationships in most databases follows only one model.
2. The relational model describes data using a standard tabular format.
3. Each attribute can take different values.
4. The tables in relational databases organize data in rows and columns.
5. Network models have become the most popular database models.

2. Put the letters in the following words into the correct order.

1) nidoma; 2) deslom; 3) tagesvadan; 4)mulnoc; 5) lueva; 6) dasdarnt; 7) matfor

2. Fill in the blanks choosing from the variants given.

1. Hierarchical and network models are still being used today, but ... are the most popular.
a) relational models; b) network models; c) hierarchical models
2. The allowable values for these attributes are called the
a) structure; b) table; c) domain
3. The tables in relational databases organize data
a) in columns; b) in rows and columns; c) in lines
4. These links dictate the way users can ... data with application programs.
a) retrieve; b) handle; c) access
5. In the relational model, each row of table represents ... , with the columns of the table representing attributes.
a) a data entity; b) database; c) warehouse

6. The relational model ... data using a standard tabular format.
a) determines; b) describes; c) performs

4. Find the words to the given definitions.

1. a database model that describes data in which all data elements are placed in two-dimensional tables, that are the logical equivalent of files;
2. the allowable values for data attributes;
3. an expansion of the hierarchical database model with an owner-member relationship in which a member may have many owners;
4. a data model in which data is organized in a top-down, or inverted tree, structure;
5. a diagram of data entities and their relationships

4. Find the answers to the questions.

1. What are the most popular database models?
2. What do the tables in relational databases do?
3. Why does each model have unique advantages and disadvantages?
4. What do rows and columns represent in a relational model?
5. Can each attribute take on only certain values or different values?

Text C: Popular Database Management Systems

The latest generation of database management systems makes it possible for end users to build their own database applications. End users are using these tools to address everyday problems like how to manage a mounting pile of information on employees, customers, inventory, or sales and fun stuff like wine lists, CD collections, and video libraries. These database management systems are an important personal productivity tool along with word processing, spreadsheet, and graphics software.

A key to making DBMSs more usable for some databases is the incorporation of “wizards” that walk you through how to build customized databases, modify ready-to-run applications, use existing record templates, and quickly locate the data you want. These applications also include powerful new features such as help systems and Web-publishing capabilities. For example, users can create a complete inventory system and then instantly post it to the Web, where it does double duty as an electronic catalog. Some of the most popular DBMSs for end users include Microsoft Access, Lotus Approach, and Inprise’s dBASE.

The complete database management software market encompasses software used by professional programmers and that runs on midrange, mainframe, and supercomputers. The entire market generates \$ 10 billion per year in revenue, with Oracle, IBM, Microsoft, Informix, and Sybase the leaders. Although Microsoft rules in desktop PC software, its share of database software on bigger computers is small.

1. Link the beginning and the end of the sentences.

1. The latest generation of database management systems makes it possible	a) its share of database software on bigger computers is small.
2. Some of the most popular DBMSs for end users include	b) word processing, spreadsheet, and graphics software.
3. These database management systems are an important personal productivity tool along with	c) for end users to build their own database applications.
4. Although Microsoft rules in desktop PC software,	d) help systems and Web-publishing capabilities.
5. These applications also include powerful new features such as	e) Microsoft Access, Lotus Approach, and Inprise's dBASE.

2. Find the words with a similar meaning in the text.

1) productivity; 2) spreadsheet; 3) capability; 4) revenue; 5) application; 6) management; 7) problem a) income; b) task, issue; c) table; d) control; e) usage; f) efficiency; g) ability
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3. Complete these sentences using a noun or a verb from the box.

a) include; b) encompasses; c) modify; d) problems; e) makes; f) incorporation
--

1. The latest generation of database management systems ... it possible for end users to build their own database applications.
2. End users are using these tools to address everyday
3. The complete database management software market ... software used by professional programmers.
4. These applications also ... powerful new features such as help systems and Web-publishing capabilities.
5. A key to making DBMSs more usable for some databases is the ... of "wizards".
6. "Wizards" help you to build customized databases, ... ready-to-run applications, use existing record templates, and quickly locate the data you want.

4. Give the English equivalents.

1) система управления базами данных; 2) большая вычислительная машина; 3) позволять; 4) текстовый редактор; 5) объединение

5. Answer the questions.

Text D: Selecting a Database Management System

Selecting the best database management system begins by analyzing database needs and characteristics. The information needs of the organization affect what type of data is collected and what type of database management system is used. Important characteristics of databases include the size of the database, number of concurrent users, performance, the ability of the DBMS to integrate with other systems, the features of the DBMS, vendor considerations, and the cost of the database management system.

The database size depends on the number of records or files in the database. The size determines the overall storage requirement for the database. Most database management systems can handle relatively small databases of less than 100 million bytes; fewer can manage terabyte-size databases.

The number of simultaneous users that can access the contents of the database is also an important factor. Clearly, a database that is meant to be used in a large workgroup must be able to support a number of concurrent users; if it cannot, then the efficiency of the members of the workgroup will be lowered. The term scalability is sometimes used to describe how well a database performs as the size of the database or the number of concurrent users is increased. A highly scalable database management system is desirable to provide flexibility. Unfortunately, many companies make a poor DBMS choice in this regard and then later are forced to convert to a new DBMS when the original does not meet expectations.

1. Agree or disagree with the following statements.

1. Selecting the best database management system begins by analyzing database needs and characteristics.
2. The database size doesn't depend on the number of records or files in the database.
3. The number of simultaneous users that can access the contents of the database is also an unimportant factor.
4. Most database management systems can handle relatively large databases of more than 100 million bytes.
5. A highly scalable database management system is desirable to provide flexibility.

2. Find the words with an opposite meaning in the text.

a) rigidity; b) unwanted; c) exclude; d) to reduce; e) minor, unimportant;
f) disintegrate; g) seller

3. Fill in the correct words from the active vocabulary.

1. The number of simultaneous users that can ... the contents of the database is also an important factor.
2. Many companies later are forced to ... to a new DBMS when the original does not meet expectations.
3. Clearly, a database that is meant to be used in a large workgroup must be able to support a number of ... users.
4. The size determines the overall storage ... for the database.
5. Unfortunately, many companies make a poor DBMS choice in this regard and then later are forced to convert to a new DBMS when the original
6. The term ... is sometimes used to describe how well a database performs.

7. Read the sentences translating the Russian fragment into English:

1. A highly scalable database management system is desirable, (чтобы обеспечить гибкость).
2. Important characteristics of databases include the size of the database, number of concurrent users, performance, (возможность СУБД объединяться с другими системами).
3. (Термин масштабируемость) is sometimes used to describe how well a database performs.
4. (Информационные потребности организации) affect what type of data is collected and what type of database management system is used.
5. Clearly, a database that is meant to be used in a large workgroup must be able to (поддерживать большое количество пользователей).
6. Most database management systems (могут управлять) relatively small databases of less than 100 million bytes.

8. Answer the questions.

1. What do the information needs of the organization affect?
2. Which databases can most database management systems handle?
3. What is desirable to provide flexibility?
4. What does the size of database determine?
5. Can you enumerate the most important characteristics of databases?

SPEAKING PRACTICE

Speak on the following topics.

1. Databases for multiusers systems.
2. Main principles of relational database.

3. Levels of database access.
4. Databases security.

UNIT 7: ARTIFICIAL INTELLIGENCE

Active vocabulary:

artificial intelligence	expert system
vision system	robotics
learning system	neural network
simulate	manipulate
replace	require
limit	logical
rational	

Text A: Artificial Intelligence

Of all the technologies the most far-reaching in its potential impact is artificial intelligence (AI). Computer scientists believe that the one area of human intelligence which is at the core of human intelligence is what is often called common sense.

The term artificial intelligence is used to describe computers with the ability to mimic or duplicate the functions of the human brain. The objective of building AI systems is to replicate human decision making for certain types of well-defined problems.

Intelligent behavior has several characteristics, including the abilities to learn from experience and apply this knowledge to new experiences; handle complex situations and solve problems for which pieces of information may be missing; think in a logical and rational manner and give a quick and correct response; and understand visual images and processing symbols.

Artificial intelligence is a broad field that includes several key components, such as expert systems, robotics, vision systems, learning systems, and neural networks. An expert system consists of the hardware and software to produce systems that act or behave like a human expert in a field or area (e.g., credit analysis). Robotics involves developing mechanical or computer devices to perform tasks that require a high degree of precision. Vision systems permit computers to capture, store, and manipulate images and pictures. Learning systems allow the computer to change how it functions or reacts to situations based on feedback it receives (e.g. a computerized chess game). A neural network is a computer system that can simulate the functioning of a human brain.

1. Read the questions and circle the correct answer.

1. The core of human intelligence is ...
a) a combination of variants; b) network technology; c) common sense;
d) PC operators
2. The term artificial intelligence is used to describe computers with the ability ...
a) to do thousands of operations; b) to mimic the functions of human brain;
c) to process graphic information; d) to model 3D environment
3. Artificial intelligence is a ... including several key components.
a) internet portal; b) automatized device; c) broad field; d) communication channel
4. Tasks for robots require a high degree of ...
a) precision; b) randomization; c) processing materials; d) network connection
5. A computer system that simulates the functioning of a human brain is called ...
a) proton system; b) Web system; c) neural network; d) graphic simulating system

2. Match the words with their synonyms.

1) completely; 2) expert; 3) field; 4) some; 5) manage; 6) allow; 7) components
a) handle; b) area; c) elements; d) specialists; e) fully; f) permit; g) several

3. Read the sentences choosing the correct word in bold type.

1. AI is the most far-reaching of all the **game applications/technologies** in its potential impact.
2. Intelligent behavior includes the abilities to learn from experience and apply this knowledge to new **experiences/protection systems**.
3. Artificial intelligence is a broad field that includes several key **network protocols/components**.
4. Learning systems use a **combination/advantage** of software and hardware.
5. An **expert/vision** system acts or behaves like a human expert in a field or area.
6. To **replicate/replace** human decision making for certain types of well-defined problems is the goal of building AI systems.
7. Vision systems permit to store and **limit/manipulate** images.

4. Give the Russian equivalents.

1) human intelligence; 2) rational manner; 3) visual images; 4) key components; 5) to perform tasks; 6) human decision making; 7) disease diagnostics system

5. Find the answers to the questions.

1. What is the core of human intelligence?
2. Is the objective of creating AI systems to replace human decision making completely?
3. Which characteristics are typical for intelligent behavior?

4. An expert system behaves like a human expert in a field, does not it?
5. How do vision systems function?

Text B: Expert system

An expert system is a computer program that uses a database of knowledge to draw conclusions. In other words, an expert system reasons.

Expert systems can explain their reasoning or suggested decisions, display intelligent behavior, manipulate symbolic information and draw conclusions from complex relationships, and deal with uncertainty. They are not yet widely used; some are difficult to use, are limited to relatively narrow problems, cannot readily deal with mixed knowledge, present the possibility for error, cannot refine their own knowledge base, are difficult to maintain, and may have high development costs. Their use also raises legal and ethical concerns.

An expert system consists of a collection of integrated and related components, including a knowledge base, an inference engine, an explanation facility, a knowledge acquisition facility, and a user interface. The knowledge base contains all the relevant data, rules, and relationships used in the expert system. The rules are often composed of if-then statements, which are used for drawing conclusions. Fuzzy logic allows expert systems to incorporate facts and relationships into expert system knowledge bases that may be imprecise or unknown.

The explanation facility of an expert system allows the user to understand what rules were used in arriving at a decision. The knowledge acquisition facility helps the user add or update knowledge in the knowledge base. The user interface makes it easier to develop and use the expert system

1. Mark the following statements as true or false.

1. An expert system doesn't reason.
2. Expert systems can draw conclusions from complex relationships.
3. They can refine their own knowledge base.
4. The user cannot understand what rules were used in arriving at a decision.
5. The knowledge base contains all the relevant data, rules and relationships used in the expert system.

2. Put the letters in the following words into the correct order.

1) sicdeoin; 2) pliduetac; 3) dewongekl; 4) fectrinae; 5) ausilv; 6) pentolait

3. Fill in the blanks choosing from the variants given.

1. An expert system consists of integrated and related
a) numbers; b) units; c) components; d) statements
2. They can ... symbolic information and draw conclusions from complex relationships.
a) change; b) manipulate; c) perform; d) present

3. The user ... makes it easier to develop and use the expert system.
a) decision; b) network; c) knowledge; d) interface
4. Expert systems can ... intelligent behavior.
a) display; b) neglect; c) leave; d) require
5. The knowledge acquisition facility helps ... add or update knowledge in the knowledge base.
a) the developer; b) the client; c) the expert; d) the user
6. Expert systems may have high ... costs.
a) development; b) energy; c) system; d) network

4. Give English equivalents.

1) предлагаемые решения; 2) включать (в); 3) делать выводы; 4) широко используются; 5) возможность ошибки; 6) пользовательский интерфейс; 7) совершенствовать.

5. Find the answers to the questions.

1. How can you define an expert system?
2. Do expert systems deal with uncertainty?
3. What does the knowledge base contain?
4. The rules are often composed of if-then statements, aren't they?
5. Can expert systems refine their own knowledge base?

Text C: Neural Networks

Neural networking is a branch of artificial intelligence that allows computers to recognize and act on patterns or trends. A neural network is a computer system that can simulate for functioning of a human brain. The systems use parallel processors in an architecture that is based on the human brain structure. In a neural net thousands of computer processing units are connected in multiple ways, just as the neurons in a brain are connected. Neural nets aren't programmed – they are trained. The net learns by trial and error like humans do.

In addition, neural network software can be used to simulate a neural network using standard computers. Neural networks can process many pieces of data at once and learn to recognize patterns. The systems then program themselves to solve related problems on their own. Some of the specific features on neural networks include the following: the ability to retrieve information, fast modification of stored data, the ability to discover relationships and trends in large databases, the ability to solve complex problems for which all the information is not present.

Neural networks excel at pattern recognition. For example, neural network computers can be used to read bank check codes despite poor-quality printing. Neural networks are also used to identify threats in the sky and to detect submarines

underwater by reading the pattern of radar waves. The power companies use neural networks to find electricity usage patterns so that they can analyze rate structures and forecast demand. Neural nets work particularly well when it comes to analyzing detailed trends – tasks that require precise analysis. This technology can also be employed to track individual users and their on-line preferences so that users at e-commerce sites don't have to input the same information each time they log-on – their data will be factored in each time they access a Web site.

1. Link the beginning and the end of the sentence.

1. Neural networking allows a computer	a) the ability to solve complex problems for which all the information is not present.
2. A neural network is designed to work	b) submarines underwater by reading the pattern of radar waves.
3. One of the specific features of neural network is	c) individual user's preferences.
4. Neural networks can detect	d) to recognize patterns and trends.
5. This technology is used to track	e) like the human brain.

2. Find the words with the similar meaning in the text.

a) to be founded; b) to give; c) to contain; d) to link; e) to need; f) to make use; g) priority
--

3. Complete the sentences using a noun or a verb from the box.

a) pattern; b) trial; c) to be trained; d) to be connected; e) to simulate; d) to process

1. Neural network is a branch of AI that allows computers to recognize
2. Neural net can ... the functioning of a human brain.
3. In a neural net computer processing units ... in multiple ways.
4. Neural nets are not programmed – they
5. The net learns by
6. Neural nets can ... information.

4. Find the terms to the given definitions.

1) computer circuitry that mimics the structure of the human brain;	a) data
2) operations performed on data to transform it in some way;	b) neural net
3) unorganized material that can be entered into a computer;	c) processor
4) opening a computer file in order to get or add information;	d) processing
5) a part of a computer that controls all the other parts of the	e) access

5. Answer the questions.

1. What is the neural networking?
2. What is the main function of neural networks?
3. Do you know what structure a neural network resembles?
4. Can you speak about the specific features of neural networking?
5. What spheres of our life are neural networks used?

Text D: Robotics

A robot is a computer that outputs motion instead of information. Robotics involves developing mechanical or computer devices than can paint cars, make precision welds, and perform other tasks that require a high degree of precision or are tedious or hazardous for human.

In general, robotic systems can do precise tasks accurately and consistently. Contemporary robotics combines high-precision machine capabilities with sophisticated controlling software and sensors. The controlling software in robots is what is most important in terms of AI. The brain in a advanced industrial robot today works at about ten million instructions per second. To achieve human intelligence, the robot brain must achieve 100 trillion operations per second. These sensors enable the robot to change its motion based on outside stimuli. The sensors can detect light, sound, touch and heat.

Robots have many applications in industry. Manufactures use robots to assemble and paint products. The robots do repetitive tasks without getting bored and careless. Robots are expensive, they work 24 hours per day, do not go on strike, do not show up to work with a hangover and do not require health insurance and pensions. The robots have enabled firms to manufacture quality products and reduce labor costs while shortening delivery time to customers. For this reasons, companies likes robots very much. As robots grow more capable, the opportunity for unskilled and semiskilled employment are sure to decline.

Although robots are essential components of today's automated manufacturing systems, future robots will find applications outside the factory in banks, restaurants, homes and hazardous working environments such as nuclear stations. A robot must not only execute tasks programmed by the user but also be able to interact with its environment through its sensors and actuators, sense and avoid unforeseen obstacles, and perform its duties much the same way humans.

1. Agree of disagree with the following statements.

1. A robot is a computer that outputs information.

2. Robotics systems don't do precise tasks accurately.
3. Software can detect light, sound and hit.
4. Robots have few applications in industry.
5. Robots are used to assemble and paint cars.

2. Find the words with the opposite meaning in the text.

1) inside; 2) interested; 3) unimportant; 4) primitive; 5) inaccurate; 6) old; 7) vague

3. Fill in the correct words from the active vocabulary.

1. Many people are working in the field of
2. Tasks performed by robots require a high degree of
3. Modern robotics combines ... machine capabilities with ... controlling software.
4. Robots have many ... in industry.
5. Robots are used for ... cars.

4. Read the sentences translating the Russian fragments into English.

1. Robots are (более эффективные) in their work than human beings.
2. Many people are working in the field of (робототехника).
3. A lot of (сложных) programs are written for robots.
4. Scientists and engineers (разрабатывать) robots for industry and homes.
5. Modern robots are capable of (имитировать) simple operations.
6. It is difficult to predict what the robots of the future will (выглядеть).

5. Answer the questions.

1. What is robotics?
2. What operations do robots perform?
3. What capabilities do modern robots combine?
4. What do you know about robots' applications in industry?
5. Why are robots essential components of automated manufacturing systems?

SPEAKING PRACTICE

Speak on the following topics.

1. The most well-known applications of AI in software development.
2. The key spheres of using expert systems.
3. Speak about the similarities between the way neural networks and the human brain work.
4. The advantages of using robots.

UNIT 8: NETWORKS

1. authorized(adj) - санкционированный	11. interconnection(n) - взаимосвязь
2. basic(adj) - основной	12. layer(n) - слой
3. bridge(n) - мост, перемычка	13. node(n) - узел
4. broadcast(v) - передавать	14. scope(n) - масштаб
5. circuitry(n) - схема, цепь	15. share(v) - делить(ся)
6. compatible(adj) - совместимый	16. spread(v) - распространяться
7. enable(v) - давать возможность	17. standalone(adj) - автономный
8. gateway(n)- межсетевой интерфейс	18. topology(n) - топология
9. high-capacity(n) - высокая емкость	19. transmission(n) - передача
10. hub(n) - гнездо коммутационной панели	20. wireless(adj) - беспроводной

Text A: Network advantages and challenges

In the early years of the personal computer's popularity, networks were scarce. Most personal computers functioned as standalone units.

Today, the pervasiveness of network has dramatically changed the face of computing by offering shared resources – hardware, software, and data made available for authorized network users to access. Networks offer the following advantages:

- Sharing networked hardware can reduce costs.
- Sharing networked hardware can provide access to a wide range of services and specialized peripheral devices. A network can allow multiple users to access internet services through a single internet connection. Networked peripheral devices, such as scanners, photo printers, plotters, high-capacity storage devices, and computer-aided manufacturing (CAM) equipment, can be accessed by any authorized network users.
- Sharing data on a network is easy.
- Networks enable people to work together regardless of time and place.

The primary disadvantage of networks is their vulnerability to unauthorized access.

Networks are more vulnerable than standalone computers to malicious code. Whereas the most prevalent threat to standalone computers is disk-borne viruses, networks are susceptible to an ever-increasing number of worms, Trojan horses and blended threats.

Most computer owners are enthusiastic about the benefits provided by networks and believe that those benefits outweigh the risks of intrusions and viruses.

1. Read the questions and circle the correct answer.

1. What allows people to work together regardless time and place?
a) a network; b) a standalone computer; c) WWW
2. How many shared resources were mentioned in the text?
a) two; b) four; c) three
3. How is the network technology developing today?
a) rapidly; b) slowly ; c) normally
4. What can't be called a security tool?
a) a firewall; b) an application; c) an antivirus software
5. Who can get an access to networked peripheral devices?
a) hacker; b) anyone; c) an authorized network user

7) Match the words with their synonyms.

1)personal	2)allow	3)benefit	4)provide	5)intrusion	6)scarce	7)number
a)supply	b)invasion	c)rare	d)use	e)public	f)quantity	g)permit

8) Read the sentences choosing the correct word in bold type.

1. A network connects various/variety IT components to allow you to share software.
2. According to the survey of 22 large transnational organizations networking/networks accounted 33 percent of their budget.
3. Many countries have become abundant/abundantly networked for business, government and personal communications.
4. Networks can provide authority/authorized users with the access to data stored on network servers or workstations.
5. The network technology is based on a set of fairly stable/stability concepts.
6. A network can be as simple/simplified as two desktop computers connected to the same printer.

9) Give the Russian equivalents.

1) reduce; 2) primary; 3) vulnerable; 4) malicious; 5) threat; 6) range; 7) plotter
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10) Find the answers to the questions.

1. Why are computer networks advantageous?
2. Do networks have disadvantages?
3. What types of shared resources are mentioned in the text?
4. What is more vulnerable to the malicious code a network or a standalone computer?

5. Many computer owners are frustrated with the benefits provided by networks, aren't they?

Text B: Network classifications

In the past, a great diversity of network technologies existed as engineers pioneered various ideas to make data transport faster, more efficient, and more secure. Today, networks are becoming more standardized.

To understand network classifications and make sense of the network options available for your computer, think of a network as composed of several layers of technology. The most important network technology layers are geographical scope, organizational structure, physical topology, network links, bandwidth and communications protocols.

From a geographic perspective networks can be classified as PANs, NANs, LANs, MANs and WANs.

A PAN(personal area network) is a term sometimes used to refer to the interconnection of personal digital devices within a range of about 30 feet (10 meters) and without the use of wires or cables.

A NAN(neighbourhood area network) provides connectivity within a limited geographical area, usually spreads over several buildings.

A LAN(local area network) is a data communications network that typically connects personal computers within a very limited geographical area – usually a single building.

A MAN(metropolitan area network) is a public high-speed network capable of voice and data transmission within a range of about 50 miles(80km).

A WAN(wide area network) covers a large geographical area and usually consist of several smaller networks, which might use different computer platforms and network technologies.

The Internet is the world's largest WAN.

1. Mark the following statements as True or False.

1. There are different kinds of networks.
2. From a geographic perspective networks can be classified only as PANs.
3. A WAN consists of one huge network.
4. LANs use a variety of wired and wireless technologies, standards and protocols.
5. Geographical scope is an area in which network devices are located.

2. Put the letters in the following words into the correct order.

1) egarn; 2) ceerus; 3) tehnoecgyol; 4) ynnocetictiv; 5) prsaed; 6) avilabael; 7) apcalbe
--

3. Fill in the blanks choosing from the variants given.

1. School computer labs and home networks are... of LANs.
a) variants; b) examples; c) types
2. Each network is... from a collection of technologies.
a) constructed; b) organized; c) generated
3. Networks for nationwide banks and superstores can be ... as WANs.
a) classified; b) referred to; c) called
4. Localized networks ... include a small number of computers.
a) never; b) typically; c) always
5. As the area of network coverage expands the number of workstations...
a) grows; b) reduces; c) rises
6. The technology from a single ... is often used in a casual conversation to classify a network.
a) layer; b) category; c) level

4. Give the English equivalents.

- 1) разнообразие; 2) прокладывать путь; 3) цифровые устройства;
4) ограниченное пространство; 5) эффективный; 6) стандартизированный

5. Find the answers to the questions.

1. Why did a great diversity of network technologies exist in the past?
2. Is geographical scope important?
3. What are the network options?
4. Can a LAN provide connectivity within an unlimited geographical area?
5. The Internet is the largest world's LAN, isn't it?

Text C: Physical topology

Each connection point on a network is referred to as a node. A network node typically contains one of the following devices:

Server: A computer responsible for storing data and programs.

Workstation: A personal computer connected to a network.

Networked peripheral: A device, such as printer or scanner, directly connected to a network rather than to a workstation.

Network device: An electronic device that broadcast network data, boost signals, or routes data to its destination. The arrangement of devices in a network is referred to as its physical topology. These are star, ring, bus, mesh, and tree topologies and the pathways between nodes can be linked by physical cables or wireless signals.

A network arranged as a star topology features a central connection point for all workstation and peripherals. The central connection point is not necessarily a server-more typically it is a network device called a hub.

A ring topology connects all devices in a circle ring. This topology minimizes cabling, but failure of any one device can take down the entire network.

A bus topology uses a common backbone to connect all network devices. The backbone functions as a shared communication link, which carries network data.

A mesh topology connects each network device to many other network devices. Data traveling on a mesh network can take any of several possible paths from its source to its destinations.

A tree topology is essentially a blend of star and bus networks. Multiple star networks are connected into a bus configuration by a backbone.

Various networks can be interconnected. Two similar networks can be connected by a device called a bridge. Networks that use different topologies and technologies can be interconnected by using gateways. The most commonly used gateway is a router, an electronic device that joins two or more networks.

1. Link the beginning and the end of the sentence.

1. A bus topology uses a common backbone	a) a blend of star and bus networks
2. The arrangement of devices in a network	b) can take down the entire network
3. A tree topology is essentially	c) is referred to as a node
4. This topology minimizes cabling, but failure of any device	d) to connect all network devices
5. Each connection point on a network	e) is referred to as its physical topology

2. Find the words with similar meaning in the text.

1) to call; 2) interconnection; 3) answerable; 4) transmit; 5) breakdown;
6) operate; 7) transfer

3. Complete these sentences using a noun or a verb from the box.

a) star topology; b) broadcasts; c) printer or scanner; d) connects;
e) sever; f) functions

1. A device, such as ... directly connected to a network rather than to a workstation.
2. An electronic device that ... network data, boost signals, or routes data to is destination.
3. A network arranged as a ... features a central connection point for all workstations and peripherals.

4. The backbone ... as shared communication link, which carries networks data.
5. The central connection point is not necessarily a ... - more typically it is a network device called a hub.
6. A mesh topology ... each network device to many other network devices.

4. Find the terms to a given definitions.

1. Reduce to the smallest possible amount
2. System of computers linked together
3. To organize things into a particular sequence or a pleasing order.
4. Information prepared for and operated on a computer programme.
5. Send out (speech, music, etc) in all directions, esp. by radio or TV.

5. Answer the questions.

- a. How are the devices on a network physically arranged?
- b. What devices does a network node typically contain?
- c. What are the advantages of each topology?
- d. Can various networks be interconnected and in what way?

Text D: Local Area Networks

Today, most LANs are configured with Ethernet technology and use compatible Wi-Fi standards in applications that require wireless access. When you connect your computer to a home, school, or workplace network, it will probably use Ethernet or Wi-Fi standards, so these technologies are worth a more detailed look.

In 1980, Bob Metcalfe's 1976 concept for Ethernet became commercially available. **Ethernet** simultaneously broadcasts data packets to all network devices. A packet is accepted only by the device to which it is addressed.

The original Ethernet standard carried data over a coaxial cable bus topology at 10 Mbps. Today, the term 'Ethernet' refers to a family of LAN technologies that offer various data transmission rates over fiber-optic and twisted-pair cables arranged in a bus or star topology. Fast Ethernet is currently the most popular for small to medium LANs, like those you might find in homes and small businesses.

Workstation and other devices that connect to an Ethernet require Ethernet circuitry, which can be built into the main board or added as an Ethernet card.

These cables link workstations and peripherals to a central connection point called an Ethernet hub. Today, most Ethernet hubs also serve as routers.

Wi-Fi, the Ethernet's cousin, refers to a set of wireless networking technologies defined by IEEE 802.11 standards that are compatible with Ethernet.

As with a wired Ethernet network, every workstation and network peripheral requires network interface circuitry, which can be built in or added as Wi-Fi card. A Wi-Fi card includes a transmitter, receiver, and antenna to transmit signals. Wi-Fi cards for notebook or tablet computers can plug into a PCMCIA slot or USB port.

Bluetooth is a short-range wireless network technology that's designed to make its own connections between electronic devices, without wires, cables or any direct action from a user. Unlike Wi-Fi, Bluetooth is not typically used to connect a collection of workstations. Instead, Bluetooth connectivity replace the short cables that would otherwise tether a mouse, keyboard, or printer to a computer.

1. Agree or disagree with the following statements.

1. Both Ethernet technology and Wi-Fi standards require wireless access.
2. Ethernet simultaneously broadcasts data packets to all network devices.
3. Ethernet technology transmits data over fiber-optic and twisted-pair cables arranged in a ring topology.
4. Wi-Fi, unlike Ethernet, is not popular with the users.
5. Bluetooth as well as Wi-Fi is used to connect a collection of workstations.

2. Find the words with an opposite meaning in the text.

1) disorganize; 2) wired; 3) obsolete; 4) subtract; 5) receive; 6) separate; 7) detach
--

3. Complete the sentences using active vocabulary.

1. Each connection point on a network is referred to as
2. Workstations and other devices that connect to an Ethernet require Ethernet
3. This ... minimizes cabling, but failure of any device can take down the entire network.
4. The most commonly used ... is a router.
5. Today, the term "Ethernet" refers to a family of LAN technologies that offer various data ... rates over fiber-optic and twisted-pair cables arranged in a bus or star topology.
6. ... networks are especially desirable for notebook and tablet computers.

4. Read the sentences translating the Russian fragments into English.

1. Ethernet simultaneously broadcasts (пакет данных) to all network devices.
2. These cables (соединяют) workstations and peripherals to a central connection called an Ethernet hub.
3. (Как в случае с проводной сетью) Ethernet, every workstation and network peripheral requires interface circuitry.
4. A Wi-Fi card (включает) a transmitter, receiver, and antenna to transmit signals.

5. (В отличие от) Wi-Fi, Bluetooth is not typically used to connect a collection of workstation.

5. Answer the questions.

1. What are the current LAN standards?
2. How does Ethernet work?
3. What equipment is required for a home Ethernet?
4. What is Wi-Fi and the equipment it requires?
5. Are there any alternative wireless networking technologies available?

SPEAKING PRACTICE

Speak on the following topics.

1. Ways of reducing costs by sharing networked hardware and software.
2. Similarities and differences of numerous types of networks.
3. Different types of network topologies and the advantages of each of them.
4. The current LAN technologies.

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МЕТОДИЧЕСКОЕ ПОСОБИЕ
ПО РАЗВИТИЮ НАВЫКОВ ЧТЕНИЯ И ГОВОРЕНИЯ
НА АНГЛИЙСКОМ ЯЗЫКЕ ДЛЯ СТУДЕНТОВ ФИТuУ
ВСЕХ ФОРМ ОБУЧЕНИЯ

INFORMATION TECHNOLOGY
TEACHING AID
FOR FULL AND PART TIME COMPUTER STUDENTS

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