КАЗАНСКИЙ ФЕДЕРАЛЬНЫЙ УНИВЕРСИТЕТ

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COMPUTER HARDWARE BASICS

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Данное пособие предназначено для бакалавров 1 и 2 курсов, обучающихся по направлениям «Информационная безопасность», «Прикладная математика и информатика», «Фундаментальная информатика и информационные технологии», «Прикладная информатика», «Программная инженерия» с уровнями владения языком B1, B2.

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Предисловие

Настоящее учебное пособие предназначено для занятий с бакалаврами 1 и 2 курсов, обучающихся по направлениям «Информационная безопасность», «Прикладная математика и информатика», «Фундаментальная информатика и информационные технологии», «Прикладная информатика», «Программная инженерия» с уровнями владения языком B1, B2. Целью учебного пособия является закрепление и автоматизация лексических навыков, систематизация и расширение словарного запаса по теме, формирование профессионально-ориентированной компетенции студентов. Пособие может быть использовано как для аудиторной работы, так и для самостоятельной работы студентов.

В задачу данного пособия входит обучение студентов монологической речи, интенсивное усвоение специальной лексики, совершенствование навыков и умений самостоятельно работать с научными текстами на английском языке с целью получения профессиональной информации.

Учебное пособие разработано с учетом требований государственного стандарта высшего образования. При отборе текстового материала в качестве основного критерия служила информативная ценность аутентичных профессионально-ориентированных текстов и их соответствие специальности студентов. Большинство текстов пособия взято из научных журналов по профилю обучения бакалавров. В некоторых случаях тексты подвергались адаптации и сокращению.

Каждая тема включает ряд заданий, направленных на совершенствование речевых навыков, связанных с научно-исследовательской и профессиональной деятельностью. В приложении приводятся глоссарий и тексты для реферирования.

Content

UNIT 1

COMPUTERS. COMPUTER HARDWARE

Speaking Practice

1. What is a computer? Is it a useful mechanism? What is the worst thing about computers? What would life be like without a computer? What do you know about them in general? Do computers ever make you become very frustrated?

Use expressions below.

Picture 1. Computers

Useful phrases for expressing opinion

In my opinion	Personally speaking	I`d say that
Personally, I think that	I reckon	I feel that
In my view	If you ask me	My feeling is that
As far as I am concerned	From my point of view	I quite agree
I completely / totally agree	That`s what I think	I will go along with that
I think so	I don`t think so	I hope so
I am afraid that	I agree / disagree	That`s true

Pre-reading tasks

2. Before reading the text, discuss the following aspects, expressing agreement or disagreement. Base your answers on your possible knowledge of the topic.

a) Civilization depends on computers nowadays.

b) There are processers everywhere, you can find them even in your car.

c) Computers are controlled by microwaves.

d) DVD player is a device for getting fun.

e) The Internet is just a generator of information.

f) You don`t track people and hear their voices trough the Internet.

g) You can receive access to the Internet at the local library.

h) Not all the media and facilities affordable are free.

i) Children learn the basics of computer use at a primary school level.

j) Computers can be used in teaching at a distance.

k) The biggest difficulty with the computer is poor eyesight.

l) There are more advantages then disadvantages with computers.

3. Read and try to memorize the following words.

impact [ˈɪmpækt] воздействие, влияние

laptop [ˈlaptɒp] лэптоп, небольшой портативный компьютер

appliance [əˈplʌɪəns] прибор, устройство, приспособление, применение

interaction [ɪntərˈakʃ(ə)n] взаимодействие, воздействие друг на друга

remote [rɪˈməʊt] удаленный, дистанционный, отдаленный

beneficial [bɛnɪˈfɪʃ(ə)l] выгодный, полезный, благотворный

portable [ˈpɔːtəb(ə)l] портативный, переносный, передвижной, портативная пишущая машинка

embedded [ɪmˈbedɪd] включённый, вкрапленный, вложенный, встроенный

versatile [ˈvəːsətʌɪl] универсальный, многоцелевой, подвижный

storage [ˈstɔːrɪdʒ] накопитель, запоминающее устройство, память

Reading tasks

4. Read the text and translate it into Russian.

COMPUTERS

Computers have had a great impact on society. Today computers are constantly becoming a part of everyday life. Computers are used in everything from the home PC or laptop to appliances such as microwaves and even our cars. Computers are used in our appliances, mobile phones, entertainment devices (such as DVD players) and others. It is almost impossible to get through one day without having some form of interaction with computers. The Internet became widespread. It provides information and services, as well as the ability to communicate people all around the world in variety of ways. These range from bulletin boards and chat rooms to voice conversations and video conferencing.

The use of computers for educational purposes has been highly beneficial for those involved. From a primary school level, children are taught the basics of computer use, including the Internet. At high school, this continues as children become more and more proficient in using the computer.

It is a tertiary level though, that computers really come into use. News, assignments, tests, lecture notes etc. can be placed on the Internet for students who live in remote areas and cannot travel to and from university or other tertiary institution each day. The idea of remote learning can also be applied to a primary school level.

A **computer** is a machine for manipulating data according to a list of instructions. Computers take numerous physical forms. Early electronic computers were the size of a large room, consuming as much power as several hundred modern personal computers. Today, computers can be made small enough to fit into a wrist watch and be powered from a watch battery. Society has come to recognize personal computers and their portable equivalent, the laptop computer, as icons of the information age; they are what most people think of as "a computer." However, the most common form of computer in use today is by far the embedded computer. Embedded computers are small, simple devices that are often used to control other devices—for example, they may be found in machines ranging from fighter aircraft to industrial robots, digital cameras, and even children's toys.

The ability to store and execute programs makes computers extremely versatile and distinguishes them from calculators. The Church–Turing thesis is a mathematical statement of this versatility: any computer with a certain minimum capability is, in principle, capable of performing the same tasks that any other computer can perform. Therefore, computers with capability and complexity ranging from that of a personal digital assistant to a supercomputer are all able to perform the same computational tasks as long as time and storage capacity are not considerations.

Computer Classification: By Size and Power

Most people associate a personal computer (PC) with the phrase computer. A PC is a small and relatively inexpensive computer designed for an individual use. PCs are based on the microprocessor technology that enables manufacturers to put an entire CPU on one chip.

Personal computers at home can be used for a number of different applications including games, word processing, accounting and other tasks. Computers are generally classified by size and power as follows, although there is considerable overlap. The differences between computer classifications generally get smaller as technology advances, creating smaller and more powerful and cost-friendly components.

- Personal computer: a small, single-user computer based on a microprocessor. In addition to the microprocessor, a personal computer has a keyboard for entering data, a monitor for displaying information, and a storage device for saving data.

- Workstation: a powerful, single-user computer. A workstation is like a personal computer, but it has a more powerful microprocessor and a higher-quality monitor.

- Minicomputer: a multi-user computer capable of supporting from 10 to hundreds of users simultaneously.

 Mainframe: a powerful multi-user computer capable of supporting many hundreds or thousands of users simultaneously.

 Supercomputer: an extremely fast computer that can perform hundreds of millions of instructions per second.

Some interesting facts about computers & its Operating Systems

- The first digital computers were developed between 1940 to 1945.
- **Konrad Zuse**, In 1941 developed **"Z3"**, the first modern computing machine.
- **Konrad Zuse** is regarded as **"the inventor of computers"**.
- **ENIAC (Electronic Numerical Integrator & Computer)** was the first US-built electronic computer.
- **ENIAC** was developed by **John Mauchly** and **J. Presper Eckert**.
- The world's first stored-program computer was "Manchester Baby" developed in 1948.
- The "**Manchester Baby"** was a small-scale experimental computer developed in Victoria University of Manchester.
- In the 1st generation of computers, Computers were built with vacuum tubes.
- In 1957, **FORTRAN** (Formula Translator) was introduced.
- Computers were built with Transistors in the 2nd generation of computers.
- In the 3rd generation of computers, Transistors were replaced with Integrated Circuits.
- In the 4th generation of computers, Microprocessors were used to built Computers.
- In 1981, **IBM PC** with Intel processors and **MS-Dos** were introduced.
- In 1984, Macintosh Computers were introduced.

- In 1985, **Microsoft Windows** GUI was introduced.
- In 1989, Intel 486 computers were introduced.
- In 1990, Windows 3.0 operating System for PCs was launched.

- In 1991, the World Wide Web was introduced to the general public.
- In 1991, Linux operating was developed.
- In 1993, Intel's **Pentium** was introduced.
- In 1995, Windows 95 operating system was made released.
- In June, 1996 Windows 4.0 operating system was released.
- On February 17, 2000, Windows 2000 was released.
- **Windows XP** was released on 25th October, 2001.
- On November 30th, 2006 **Windows Vista** was released.
- On July 22nd 2009, Windows 7 was introduced.
- On Windows 8, the successor of **Windows 7** was released on October 28th, 2012.

(http://www.webopedia.com/TERM/C/computer.html; http://subject.com.ua/lesson/english/10klas/44.html, http://www.byte-notes.com/what-computer)

5. Answer the questions according to the text.

a) Have computers become an integral part of our life?

b) Where are computers used?

c) What types of appliances are used in computers?

d) What is the Internet?

e) How can the Internet be useful for you?

f) What kinds of services does the Internet provide?

g) Where can we get access to the Internet?

h) Is all the information available in the Internet?

i) How are children taught to use the computer?

j) How can computer be useful in education?

k) What are the disadvantages of a computer?

l) Does computer continue to have an increasing impact on society?

m) What types of computers do you know? What are their similarities and differences?

n) What important events from the history of computers do you remember?

6. **These statements are all false. Using information from the text point out the mistakes and correct them.**

a) Website provides data and services, as well as the capability to join people all around the world.

b) The Internet is open to millions of children.

c) The idea of remote learning can not be applied to students.

d) A personal computer has a keyboard for receiving data.

e) Laptops can be made larger enough to fit into a wristwatch and be powered from a watch battery.

f) A multi-user computer incapable of supporting from 10 to hundreds of users simultaneously.

g) Supercomputer is an extremely slow computer that can perform several instructions per second.

h) The differences between computer classifications generally get larger as equipment advances.

7. Let's start building a computer. Look at the words which you can see below. How are the presented parts called? Choose one from each group of words underneath the outlines.

a. stamrer, fprinter, printer

b. case, cotton, container

c. nowse, mouse, moves

d. writer, letterboard, keyboard

8. Read and translate the text about operating systems in order to answer to the questions.

a. Does operating system use the hardware to run the computer?

b. What is operating system?

c. What will happen if hardware works with the wrong drivers?

An operating structure (called an OS for short) is a set of programs that conducts your computer. A computer is made of hardware (your monitor, hard disk, motherboard and so on) and software (for example your word processor, and the web browser you are reading this on right now). The occupation of the operating

system is to tell the hardware how it should operate, and how the software should use the hardware. It also provides the basic user interface - the thing that tells you where your files are, how to open them, close them and so on.

You are probably familiar with the Windows operating system, but there are many different types of windows OS, and many other operating systems that are completely different. All the hardware on your computer has a program called a 'driver'. For a piece of hardware to run it needs to have a driver written for the OS of the mainframe it is plugged into. The driver tells the OS what the hardware is, and how it should be used. Even if the same hardware can be used on several different operating systems, it needs a separate driver for each of them. This means that if you want to change your OS, you need to check carefully that your hardware has drivers for the new OS or the hardware will stop working.

9. Remember the meaning of new words and try to translate the phrases used with these words.

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

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

10. Translate into English the following verbs:

передавать, преобразовывать, создавать, расширять, повторять, оборудовать, объединять, выполнять, повторять, сжимать, разделять, получать, поддерживать, исключать, комбинировать, осуществлять, формировать, реагировать, обрабатывать, увеличить, возникать, перемещать, появляться, смещать, занести данные, производить действие, пробивать отверстие, заносить в файл, иметь смысл, установить .

UNIT 2

MONITOR

Speaking Practice

1. In pairs, label the elements of the computer system. Are there elements, which are not connected with a computer?

Picture 2. Computer hardware

Pre-reading tasks

2. What do you know about External hardware parts? What are they used for? In pairs discuss your ideas.

- Keyboard
- Flat-panel, Monitor, and LCD
- Microphone
- Mouse

- Printer
- Projector
- Scanner
- Speakers
- USB thumb drive

3.Do the same work with the Internal hardware examples as in the Task 1.

- Processor (CPU)
- Drive (e.g. Blu-ray, CD-ROM, DVD, floppy drive, hard drive, and SSD)
- Fan (heat sink)
- Modem
- Motherboard
- Network card
- RAM
- Sound card
- Video card

4. Try to remember the following words and phrases.

hardware [ˈhɑːdwɛː**]** – оборудование, аппаратура, аппаратное обеспечение, хардвер, "железо"

higher resolution [ˈhʌɪə rɛzəˈluːʃ(ə)n**]** – более высокое разрешение, большее разрешение

computer case [kəmˈpjuːtə keɪs**]** – корпус компьютера

compatibility [kəmˌpatɪˈbɪlɪti]– совместимость, сочетаемость

Liquid Crystal Display [ˈlɪkwɪd ˈkrɪst(ə)l dɪˈspleɪ] – жидкокристаллический дисплей

transparent electrodes [tranˈspar(ə)nt ɪˈlɛktrəʊd**]** – прозрачный электрод

distort [dɪˈstɔːt**]** – искажать искривлять, деформироваться

alterations [ɔːltəˈreɪʃ(ə)n**]** – изменения

main computer housing [meɪn kəmˈpjuːtə haʊzɪŋ**]** – корпус основного компьютера

distinction [dɪˈstɪŋ(k)ʃ(ə)n**]** – различие

transmit [tranzˈmɪt**]** – передавать, пропускать

Reading tasks

5. **Now read the text to check your answers and do the tasks, which follow**.

MONITOR

In information technology, hardware is the physical aspect of computers, telecommunications, and other devices. The term arose as a way to distinguish the "box" and the electronic circuitry and components of a computer from the program you put in it to make it do things. The program came to be known as the software. Hardware implies permanence and invariability. Software or programming can easily be varied. You can put an entirely new program in the hardware and make it create an entirely new experience for the user. You can, however, change the modular configurations that most computers come with by adding new adapters or cards that extend the computer's capabilities.

Like software, hardware is a collective term. Hardware includes not only the computer proper but also the cables, connectors, power supply units, and peripheral devices such as the keyboard, mouse, audio speakers, and printers. Hardware is

sometimes used as a term collectively describing the physical aspects of telephony and telecommunications network infrastructure.

Monitor. The monitor is the piece of computer hardware that displays the video and graphics information generated by the computer through the video card. Monitors are very similar to televisions but usually display information at a much higher resolution. Also unlike televisions, monitors are not usually mounted on a wall but instead sit a top a desk. A monitor is sometimes referred to as a screen, display, video display, video display terminal, video display unit, or video screen. A monitor is sometimes incorrectly referred to as the computer, as in the hardware within the computer case, like the hard drive, video card, etc. For example, shutting down the computer isn't the same thing as turning off the monitor. It's important for that distinction to be made. A monitor, no matter the type, usually connects to either an HDMI, DVI, or VGA port. Other connectors include USB, DisplayPort, and Thunderbolt. Before investing in a new monitor, make sure that both devices support the same type of connection. For example, you don't want to buy a monitor that has only an HDMI port when your computer is only capable of accepting a VGA connection. Although most video cards and monitors have multiple ports so as to work with various kinds of both devices, it's still important to check their compatibility. If you do need to connect an older cable to a newer port, like VGA to HDMI, there are adapters for this very purpose. Monitors are not typically user serviceable. For your safety, it's not usually wise to open and work on a monitor.

Monitors are display devices external to the computer case and connect via a cable to a port on the video card or motherboard. Even though the monitor sits outside the main computer housing, it is an essential part of the complete system. Monitors come in two major types - LCD or CRT, but others exist too, like OLED. CRT monitors look much like old-fashioned televisions and are very deep in size. LCD monitors are much thinner, use less energy, and provide a greater graphics

quality. OLED is an improvement on LCD that provides even better color and viewing angles but also requires more power.

LCD monitors have completely obsoleted CRT monitors due to their higher quality, smaller "footprint" on the desk, and decreasing price. OLED, although newer, is still more expensive and therefore not as widely used when it comes to monitors in the home. Most monitors are in a widescreen format and range in size from 17" to 24" or more. This size is a diagonal measurement from one corner of the screen to the other. Monitors are built-in as part of the computer system in laptops, tablets, netbooks, and all-in-one desktop machines. However, you can buy one separately if you're looking to upgrade from your current monitor. Although monitors are considered output devices since they usually only serve the purpose of outputting information to the screen, some of them are touch screens as well. Some monitors have integrated accessories like a microphone, speakers, camera, or USB hub.

LCD (Liquid Crystal Display) Monitors

Liquid crystal display, also known as liquid crystal diode, is one of the most advanced technologies available at present. Typically, an LCD monitor consists of a layer of color or monochrome pixels arranged schematically between a couple of transparent electrodes and two polarizing filters. Optical effect is achieved by polarizing the light in varied amounts and making it pass through the liquid crystal layer. At present, there are two types of LCD technology available. These include the active matrix or TFT and a passive matrix technology. Among these, TFT technology is more secure and reliable, and generates better picture quality. On the other hand, passive matrix has a slow response time and is slowly becoming outdated.

In recent times, LCD monitors have become increasing popular with consumers. Some major advantages of using an LCD monitor include:

- These monitors are compact, lightweight, and do not consume much desk space.
- Secondly, these monitors do not consume much electricity and can even be operated by using batteries.
- Also, the images transmitted by these monitors do not get geometrically distorted and have little flicker.

However, LCD monitors do have certain disadvantages. Most importantly, these monitors are very expensive. Secondly, image quality is not constant when viewed from different angles. Also, an LCD monitor's resolution is always constant. Any alterations can result in a reduced performance.

(http://www.tech-faq.com/types-of-computer-monitors.html)

6. Answer the questions according to the text.

a. What is a monitor?

b. What is the difference between shutting down and turning off the computer?

c. What types of connectors are presented in this text?

d. How monitors are connected to the port?

e. What integrated accessories do some monitors have?

f. What does Liquid Crystal Display consist of?

g. How does CRT monitor look like?

h. What kinds of LCD technologies do you know?

i. Do LCD monitors have disadvantages?

j. Is LCD monitor's resolution always constant?

7. Find the Russian equivalents of the following English word combinations.

1. video display terminal	a. слой
2. multiple ports	b. видео терминал
3. cover	c. несколько портов
4. touch screens	d. комплексный
5. combined	e. сенсорный экран

8. Complete the sentences with the given words.

save, splashed, record, watching, skipping, flapped across, gas expulsion, flat-screen, monitor, elections

a) The thin monitors … universe.

b) UN monitors will remain in the country to supervise the ...

c) Plasma screen is called … display.

d) The big display in the center was all black, except for some green text … across the screen.

e) If they use a … monitor, they can raise or lower the apparatus that holds it.

f) To monitor your methodical progress, … the results of work.

g) When you are staring at the your … waiting the download of image.

h) I 'm sorry, but it's my duty as hall monitor to catch those who are … and report them.

i) The indicator operator was … carefully as the failure on it`s monitor signifying the Renegade crawled into the system.

9. Let's build a computer. The words given below will help you to assemble a computer hardware. Choose just one word from each line in order to compile a hardware.

a. Mowse pad, mice base, mouse pad

b. minotaur, monitor, scream

c. graphics card, card holder, card reader

d. interneter, ruter, router

10. Translate these word combinations into English.

Видимые устройства; система обработки данных; аппаратное обеспечение; набор компьютерных программ; соответствующая документация; эффективная работа; системное программное обеспечение; прикладное программное обеспечение; системный программист; платежная ведомость; переучет; анализ инвестиций; прикладная программа; работающий только в режиме чтения; постоянное запоминающее устройство; последовательность команд; в случае; производительность; электронная цепь; умножать числа; заставить машину выполнять ту же функцию; выполнять сложение.

UNIT 3

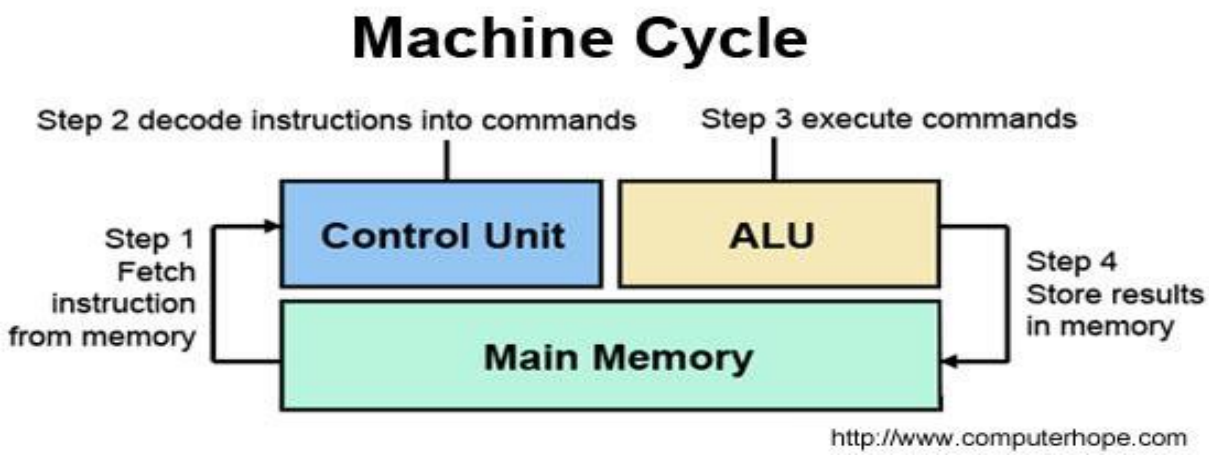
CPU (CENTRAL PROCESSING UNIT)

Speaking Practice

1. Look at the illustrations of this unit. Do you guess what scheme, patterns mean?

Describe the pictures, using the following phrases:

The photo/picture shows …	Maybe …
There's / There are …	I think... Maybe/Perhaps...
In the middle/center there are …	I think …
On the left/right there are …	It makes me think of …
It seems as if …	It looks like a ...
In the picture I can see …	It might be a ...



Picture 4. CPU

Pre-reading tasks

2. Rearrange the letters to make things, which can be part of a CPU.

tucmepor _____e. g. computer

trirpen _____

nnersca _____

kesd _____

hacir _____

nopelethe_____

eyk_____

DAP_____

elbac_____

glup_____

3. There are some words from the text. Read them before translating the text. Then find these words from the text and read the whole sentences with them.

Central Processing Unit [ˈsɛntr(ə)l ˈprəʊsesɪŋ ˈjuːnɪt] центральный процессор

handle [ˈhand(ə)l] обращаться, управлять, регулировать

chip [ʧɪp] микросхема, обломок, чип

acronym [ˈakrənɪm] акроним

fetch [fɛʧ] получать, выбирать, привести, приносить

execution [ˌɛksɪˈkjuːʃ(ə)n] выполнение, исполнение

appropriate [əˈprəʊpriət] соответствующий, подходящий; уместный

transistor [tranˈzɪstə] транзистор, транзисторный радиоприемник, кристаллотриод

manufacturer [ˌmanjʊˈfakʧ(ə)rə] изготовитель, производитель, поставщик, предприятие обрабатывающей промышленности

Reading tasks

4. Read the text and translate it into Russian.

CPU (CENTRAL PROCESSING UNIT)

Alternately referred to as a **processor**, **central processor**, or **microprocessor**, the **CPU** (pronounced sea-pea-you) is the **Central Processing Unit** of the computer. A computer's CPU handles all instructions it receives from hardware and software running on the computer. The CPU is often referred to as the **brain** of the computer. However, it is more appropriate to refer to software

as the brain and the CPU as a very efficient calculator. A CPU is really good with numbers, but if it wasn't for the software it wouldn't know how to do anything else.

Many new computer users may improperly call their computer and sometimes their monitor the CPU. When referring to your computer or monitor, it is proper to refer to them as either the "computer" or "monitor" and not a CPU. The CPU is a chip within the computer.

Processors produce heat, so they are covered with a heat sink to keep them cool and running smoothly. The CPU was first developed at Intel with the help of Ted Hoff and others in the early 1970's. The first processor released by Intel was the 4004 processor.

The CPU (Central Processing Unit) is the brain of the computer and the most important chip in the computer. When a program is run, the CPU performs the calculations and carries out the commands.

Modern processors contain millions of transistors (miniature electronic switches) that are etched onto a small silicon square called a die. The die is about the width of the thumb. The processor generates quite a lot of heat, so it always has a heat sink and fan that lies on top of it that prevents it from getting too hot.

The faster the CPU the better. Speed is measured in MHz (megahertz) or GHz (gigahertz). Make sure that the CPU is compatible with the motherboard and has the same type of socket. Most new processors are 64-bit. This means that they support the upcoming Windows Vista. 64-bit processors can also run 32-bit applications, but not the other way around. Try to go for 64-bit, as 32-bit processors will soon be out of date. Dual Core processors combine two or more processors into a single package. This speeds up the CPU drastically and enables optimal speed when running many programs at the same time.

CPU is an acronym that stands for central processing unit. The central processing unit is responsible for performing all of the mathematical calculations that are required for a computer to function properly. Because a computer cannot

function without the CPU (which may also be referred to as the central processor or just the processor), it is not uncommon to hear people refer to the CPU as the "brains" of a computer.

How does the CPU work?

To properly perform its job, the CPU must complete a cycle of four steps. The first step in this cycle is to fetch an instruction from a software program's memory. Once the CPU fetches the instruction, its second step is to decode the instruction. By decoding the instruction, the CPU is able to organize the information from the instruction in a manner that allows the CPU to complete the next step, which is executing.

During the execution step, the CPU completes the instruction. It accomplishes this by following the information gained during the decoding step. Once the CPU has finished executing the instruction, the final step in this cycle is to write-back the results that occurred during the execution step. The CPU can write-back the results to its own internal register, or to the main memory of the computer.

CPU Clock Speed

The clock speed of a processor is the number of instructions it can process in any given second, measured in gigahertz (GHz).For example, a CPU has a clock speed of 1 Hz if it can process one piece of instruction every second. Extrapolating this to a more real-world example: a CPU with a clock speed of 3.0 GHz can process 3 billion instructions each second.

CPU Cores

Some devices have a single-core processor while others may have a dual-core (or quad-core, etc.) processor. As might already be apparent, having two processor units working side by side means that the CPU can simultaneously

manage twice the instructions every second, drastically improving performance. Some CPUs can virtualize two cores for every one physical core that's available, known as Hyper-Threading. *Virtualizing* means that a CPU with only four cores can function as if it has eight, with the additional virtual CPU cores referred to as separate *threads*. *Physical* cores, though, do perform better than *virtual* ones.

CPU permitting, some applications can use what's called *multithreading*. If a thread is understood as a single piece of a computer process, then using multiple threads in a single CPU core means more instructions can be understood and processed at once. Some software can take advantage of this feature on more than one CPU core, which means that even more instructions can be processed simultaneously.

Example: Intel Core i3 vs. i5 vs. i7

For a more specific example of how some CPUs are faster than others, let's look at how Intel has developed its processors. Just as you'd probably suspect from their naming, Intel Core i7 chips perform better than i5 chips, which perform better than i3 chips. Why one performs better or worse than others is a bit more complex but still pretty easy to understand.

Intel Core i3 processors are dual-core processors, while i5 and i7 chips are quad-core. Turbo Boost is a feature in i5 and i7 chips that enables the processor to increase its clock speed past its base speed, like from 3.0 GHz to 3.5 GHz, whenever it needs to. Intel Core i3 chips don't have this capability. Processor models ending in "K" can be overclocked, which means this additional clock speed can be forced and utilized all the time. Hyper-Threading, as mentioned earlier, enables the two threads to be processed per each CPU core. This means i3 processors with Hyper-Threading support just four simultaneous threads (since they're dual-core processors). Intel Core i5 processors don't support Hyper-Threading, which means they, too, can work with four threads at the same time. I7

processors, however, do support this technology, and therefore (being quad-core) can process 8 threads at the same time.

Due to the power constraints inherent in devices that don't have a continuous supply of power (battery-powered products like smartphones, tablets, etc.), their processors—regardless if they're i3, i5, or i7—differ from desktop CPUs in that they have to find a balance between performance and power consumption.

More Information on CPUs

Neither clock speed, nor simply the number of CPU cores, is the sole factor determining whether one CPU is "better" than another. It often depends most on the type of software that runs on the computer—in other words, the applications that will be using the CPU. One CPU may have a low clock speed but is a quad-core processor, while another has a high clock speed but is only a dual-core processor. Deciding which CPU would outperform the other, again, depends entirely on what the CPU is being used for.

For example, a CPU-demanding video editing program that functions best on multiple CPU cores is going to work better on a multicore processor with low clock speeds than it would on a single-core CPU with high clock speeds. Not all software, games, and so on can even take advantage of more than just one or two cores, making any more available CPU cores pretty useless. Another component of a CPU is cache. CPU cache is like a temporary holding place for commonly used data. Instead of calling on random access memory (RAM) for these items, the CPU determines what data you seem to keep using, assumes you'll want to *keep* using it, and stores it in the cache. Cache is faster than using RAM because it's a physical part of the processor; more cache means more space for holding such information.

Whether your computer can run a 32-bit or 64-bit operating system depends on the size of data units that the CPU can handle. More memory can be accessed at

once and in larger pieces with a 64-bit processor than a 32-bit one, which is why operating systems and applications that are 64-bit-specific cannot run on a 32-bit processor. You can see a computer's CPU details, along with other hardware information, with most of these free system information tools. Each motherboard supports only a certain range of CPU types, so always check with your motherboard manufacturer before making a purchase.

CPU Manufacturers

While there are numerous companies that make CPUs for different purposes, the two best known makers of CPUs for consumer computers are AMD and Intel. AMD's current line of processors includes Athlon, Phenom, Sempron and Turion processors, while Intel's current line of processors includes the Celeron, Pentium, Core 2, Centrino and Centrino 2 processors.

(http://en.academic.ru/dic.nsf/enwiki/2810#History, https://www.lifewire.com/what-is-a-cpu-2618150,http://www.tech-faq.com/cpu.html)

5. Answer the questions, using the information from the text.

a. What is CPU referred to?

b. Can we call CPU as a chip within the computer?

c. What do processors produce?

d. What happened in 1970?

e. What does CPU perform?

f. How miniature electronic switches are called in another way?

g. How can you characterize 64-bit processors?

h. What are the main functions of Dual Core processors?

i. How does processor work?

j. What CPU manufacturers do you know?

6. Choose the correct word in order to get a correct answer.

a. To turn on the computer. Or_____the button.

(start, press, change)

b. I have to _____ a computer screen for ten hours a day.

(*peek, look at, watch)*

c. _____ a key in order to continue.

(kick, crash, knockout)

d. Students _____ the CD ROM.

(*insert, put, inject)*

e. Before you begin your work, _____ the height of the arm-chair.

(adjust, change, rearrange)

f. TV and computer VDTs are measured in _____.

(*feet, miles, inches*)

7. Give English equivalents for the following word combinations, using the text.

Частота процессора, количество команд, программное обеспечение, двухъядерный или четырехъядерный, некоторые приложения, дополнительные виртуальные ядра процессора, резко повышая производительность, программа для редактирования видео, с низкой тактовой частотой, оперативную память (ОЗУ), кэш быстрее, чем использование ОЗУ, материнская плата поддерживает, 32-разрядная или 64-разрядная операционная система.

8. Remember the meaning of new words and try to translate the phrases used with these words.

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

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

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

9. Circle the letter or fill in the correct answer.

1. People, actions, software, hardware, and information in other words are the five parts of a(n)…

(*a. information system c. information technology b. computer system d. software system)*

2. Processes are typically recorded in manuals written by…

(a. computer specialists c. Microsoft b. end users d. service providers)

3. Which of the next items is an example of connectivity?...

(a. data c. Internet b. hard disk d. power cord)

4. Windows XP is an example of a (n)…

(a. application software c. operating system b. browser d. shareware)

5. The least powerful, but the most widely used and fastest-growing type of computer is …

(a. mainframe computers c. minicomputers b. palmtops d. supercomputers)

6. The system component that controls and operates data in order to produce information is called the…

(a. keyboard c. monitor b. microprocessor d. mouse)

7. These devices translate data and programs that persons can understand into a form that the computer can process.

(a. display c. output b. input d. pointer)

8. A DVD is a pattern of a(n)…

(a. hard disk c. output device b. optical disc d. solid-state storage device)

9. This type of file is created by word processors.

(a. worksheet c. database b. document d. presentation)

10. Many experts are calculating that this revolution is expected to powerfully affect the way we communicate and use computer technology.

(a. graphics c. memory b. input d. wireless)

10. Translate the text into English.

Процессоры наших дней имеют возможность многоканальной работы с оперативной памятью, появляются новые инструкции, в свою очередь благодаря которым повышается его функциональный уровень. Возможность обработки графики самим процессором обеспечивает понижение стоимости, как на сами процессоры, так и благодаря им на офисные и домашние сборки компьютеров. Появляются виртуальные ядра для более практичного распределения производительности, развиваются технологи, а вместе с ними и центральный процессор.

UNIT 4

MOTHERBOARD

Speaking Practice

1. What do you know about motherboard? Give your definition, using these words and phrases: *various devices, hub, mainboard, it has several interfaces; microprocessor, numerous chips; the motherboard also has slots or ports; different configurations.*

Useful phrases to express your opinion:

first of all	in other words	look here
just for the record	after all	to say nothing of
you are right	no doubt	naturally
quite so	I suppose so	it can hardly be so

Picture 5. Motherboard

Pre-reading tasks

2. Match these words to correct locations.

a. games	b. machines	c. tickets
d. wages	e. flight	f. letters
g. barcode readers	h. tills	i. bills
j. buyers	k. laptop	l. salesperson

a home, a factory, a supermarket, a travel agent

3. Read and try to memorize the words.

motherboard [ˈmʌðəbɔːd] системная плата, материнская плата

sound card [saʊnd kɑːd] звуковая карта, звуковой адаптер, звуковое устройство

essential [ɪˈsɛnʃ(ə)l] необходимый, существенный, основной

interface [ˈɪntəfeɪs] интерфейс, стык, поверхность

budget [ˈbʌdʒɪt] бюджет, запас, финансовая смета

bridge [brɪdʒ] мостик, перемычка

socket [ˈsɒkɪt] гнездо, розетка

purchase [ˈpəːʧɪs] покупка, приобретение, закупка, стоимость

rectangular [rɛkˈtaŋgjʊlə] прямоугольный

attachement [əˈtætʃ.mənt] вложение, прикрепление

Reading tasks

4. Read the text and translate it into Russian.

MOTHERBOARD

A motherboard is the major, underlying circuit board of a computer. The Central Processing Unit (CPU), Random Access Memory (RAM), and various disk or optical drives are all plugged into interfaces on it. A video interface and sound card can also be built-in or added, and additional connections are used by peripherals and various devices. The motherboard is the most essential component in a personal computer. It is the piece of hardware that contains the computer's micro-processing chip and everything attached to it is vital to making the computer to run. The term "mainboard" is also sometimes used to refer to the motherboard.

One of the major functions of a motherboard is to act as the "hub" to which other computer devices connect. A board can come in many configurations to fit different needs and budgets. At its most basic, it has several interfaces for necessary components and numerous microchips that control computer startup. Many computer enthusiasts favor one type of board over another and choose a manufacturer based on the firmware installed on it or the types of hardware it supports.

Numerous chips and components are physically installed onto a board, including the north and south bridge. These are two chipsets that are used with the CPU to allow communication between the processor and memory. All important components are connected either directly or indirectly to the board, so it serves as the "nervous system" of a computer. An important feature of a motherboard is the socket used to house the CPU. Different types of sockets are found on various

boards, with different configurations for the processor pins. These fit into the socket, allowing it to act as the primary processor of a computer. Motherboards typically support a specific type of CPU, such as a processor made by AMD™ or Intel™. Among the processors available, there are different grades of CPUs. An AMD™ 64-bit processor requires a different CPU socket than an AMD™ 32-bit processor. Someone purchasing parts to build a computer needs to ensure that the CPU and motherboard are compatible.

Motherboard Components

The motherboard is the flat, rectangular piece of circuit board inside the computer's case to which everything seems to connect to for one reason or another. It contains the following key components:

- A microprocessor "socket" that defines what kind of central processing unit the motherboard uses
- A chipset that forms the computer's logic system. It is usually composed of two parts called bridges (a "north" bridge and its opposite, "south" bridge), which connect the CPU to the rest of the system
- A Basic Input/Output System (BIOS) chip that controls the most basic computer function and how to repair it.
- A real-time clock that is a battery operated chip that maintains the system's time and other basic functions.

The motherboard also has slots or ports for the attachment of various peripherals or support system/hardware. There is an Accelerated Graphics Port that is used exclusively for video cards, an Integrated Drive Electronics that provides the interfaces for the hard disk drives, Memory or RAM cards, a Peripheral Component Interconnect (PCI), which provides electronic connections for video capture cards and network cards, among others.

(http://www.tech-faq.com/motherboard.html)

5. General understanding.

a. Call the main circuit board of a computer.

b. What drivers are situated on the motherboard?

c. What is the difference between mainboard and motherboard?

d. Where are the north and south bridges installed?

f. What does the “nervous system” of a computer mean?

g. What is the important feature of a motherboard?

h. What does motherboard contain?

i. Does BIOS control the most basic computer function?

j. Does a real-time clock maintain the system’s time and other basic functions?

k. Where is an Accelerated Graphics Port used?

6. Mark the sentences T (true) or F (false) using the text.

a. A motherboard is a less important circuit board of a computer.

b. The motherboard is the most essential component in a computer.

c. Various chips and components are physically installed in RAM.

d. An significant piece of a motherboard is the socket.

e. Different types of sockets are found on one board.

f. A chipset forms the computer’s logic system.

g. A Basic Input/Output System (BIOS) chip controls the most basic computer function.

7. Translate the word combinations into English.

64-разрядного процессора AMD ™, чем 32-разрядный процессор AMD ™, материнские платы обычно поддерживают, процессор AMD ™ или Intel ™, компоненты материнской платы, плоская прямоугольная часть, ключевые компоненты, логическая система компьютера, часы реального времени, для подключения различных периферийных устройств, чипы с батарейным питанием.

9. Complete the sentences using the following words:

chips, dual, core, megabytes, megahertz, motherboard, processor, speed, upgraded

The "wits" of a computer is the 1_____. Many of these parts are made by Intel and AMD, and are sometimes referred to as 2 "_____". The fastest PCs are 3_____, which means that there are two computers working together. The 4 _____ of a processor is measured in 5_____, which is frequently written as MHz. A computer's recollection is restrained in 6_____. If a computer has 1,024 megabytes of memory, and the memory form is SDRAM, this is written as 1,024 MB SDRAM, and is marked "a thousand and twenty-four megabytes ess-dee-dram". The processor and memory constituents are located on the 7_____. Changing a computer's processor is not generally concrete, but the memory can commonly be 8_____.

10. Translate the sentences from Russian into English.

a. В 1673 году саксонский математик и философ Готфрид фон Лейбниц изобрёл машину, выполнявшую четыре основных математических действия.

b. Когда говорят о поколениях, то в первую очередь говорят об историческом портрете электронно-вычислительных машин (ЭВМ).

c. В 1959 г. был изобретен метод, позволивший создавать на одной пластине и транзисторы.

d. Микропроцессор – это миниатюрный мозг, работающий по программе, заложенной в его память.

e.В 1834 году Чарльз Бэббидж описал свою аналитическую машину (Analytical Engine).

f. В 1976 году фирма Intel закончила разработку 16-разрядного процессора 8086.

g. В 1944 г. американец Говард Айкен на одном из предприятий фирмы IBM построил мощную по тем временам машину «Марк – 1».

h. В 1963 году был разработан алгоритмический язык программирования Бейсик.

i. В Windows 95 фирма Microsoft впервые использовала новый протокол Plug & Play, который позволял устройствам устанавливаться в систему в автоматическом режиме.

j. Машины пятого поколения — это реализованный искусственный интеллект.

UNIT 5

EXPANSION CARD

Speaking Practice

1. Discuss the following items with your partner.

As it is seen in the photo, an expansion card has two main parts, the first is the gold plated connector that connects to a motherboard expansion hole and the connector platter.

Expansion cards from time to time can be called daughterboard. However, it is more suitable to refer to them as expansion cards or one of the terms mentioned earlier.

One modern trend in computer production is microminiaturization.

If you could not discovery the corresponding jot to connect on your motherboard, please refer to your motherboard manual.

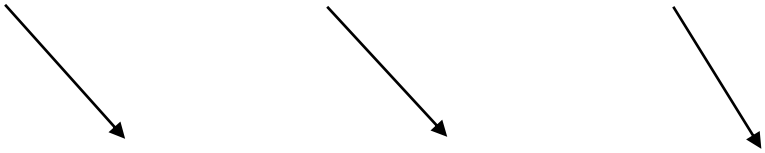
Plug in the power cord and other cables, and then press the control button to turn on the computer.

Picture 6. Expansion card

Pre-reading tasks

2. Match the words.

1. recharge 2. click on 3. dial 4. give 5. move 6. print out 7. send and receive 8. take some



a. digital photos b. faxes

c. a number on your mobile phone d. a presentation

e. something with the mouse f. the battery

g. the mouse h. twenty pages

3. Read and memorize the following words. Make up sentences with them.

expansion card [ɪkˈspanʃ(ə)n kɑːd] плата расширения

enhanced [ɪnˈhɑːnst] усовершенствованный, улучшенный, расширенный

dimensional [dɪˈmɛnʃ(ə)n(ə)l] размерный, относящийся к размеру или величине

removable [rɪˈmuːvəbl] съемный, сменный, подвижной, устранимый, передвигаемый, сменяемый

via [ˈvaɪə] путём, через посредство, с помощью

involve [ɪnˈvɒlv] включать, содержать, подразумевать, предполагать, влечь за собой, вызывать (последствия); приводить (к чему-л.)

capacity [kəˈpasɪti] ёмкость, вместимость, объём

expand [ɪkˈspand] расширяться, расширять, развивать, развиваться, распространять

bandwith [ˈbandwɪtθ] ширина полосы, полоса пропускания, пропускная способность, иногда скорость в…

launch [lɔːn(t)ʃ] запускать, начинать, выпускать

retrieve [rɪˈtriːv] извлекать, вернуть, восстанавливать, находить, вернуть себе, исправлять, обрести

Reading tasks

4. Read the text and translate it into Russian.

EXPANSION CARD

An expansion card is an electronic circuit board that adds more functionality to a desktop computer. These cards are installed into the expansion slot of a computer motherboard, and they allow the computer to perform additional functions not offered by the motherboard. Video cards and sound cards are common examples: a new video card added will enhance the three dimensional graphics processing power of a computer while a new sound card may improve a computer's audio input.

There are alternative terms used for this type of card, and it is also known as expansion board, add-on card, interface adapter or an internal card. Generally, between one and seven expansion cards can be installed into the desktop computer system. Laptops do not use standard cards due to their small form factor, although they can often accept a removable PCMCIA card that offers additional functions.

The Altair 8800, developed in the mid 1970s, was the first microcomputer to add an expansion card bus. In 1981, IBM® launched its first PC with an XT bus, which was later replaced with a 16-bit ISA. The introduction of the PCI bus in 1991

resulted in modern forms of interface adapters that provided additional benefits beyond enhanced graphics and sound.

The expansion card (also *expansion board*, *adapter card* or *accessory card*) in computing is a printed circuit board that can be inserted into an expansion slot of a computer motherboard or backplane to add functionality to a computer system via the expansion bus. One edge of the expansion card holds the contacts (the edge connector) that fit exactly into the slot. They establish the electrical contact between the electronics (mostly integrated circuits) on the card and on the motherboard.

Connectors mounted on the bracket allow the connection of external devices to the card. Depending on the form factor of the motherboard and case, around one to seven expansion cards can be added to a computer system. 19 or more expansion cards can be installed in backplane systems. There are also other factors involved in expansion card capacity. For example, most graphics cards on the market as of 2010 are dual slot graphics cards, using the second slot as a place to put an active heat sink with a fan. Some cards are "low-profile" cards, meaning that they are shorter than standard cards and will fit in a lower height computer chassis. (There is a "low profile PCI card" standard[1] that specifies a much smaller bracket and board area). The group of expansion cards that are used an expansion card bus, such as network, SAN or modem cards, are commonly referred to as input/output cards (or I/O cards).

The primary purpose of an expansion card is to provide or expand on features not offered by the motherboard. For example, the original IBM PC did not provide graphics or hard drive capability. In that case, a graphics card and an ST-506 hard disk controller card provided graphics capability and hard drive interface respectively. In the case of expansion of on-board capability, a motherboard may provide a single serial RS232 port or Ethernet port. An expansion card can be installed to offer multiple RS232 ports or multiple and higher

bandwidth Ethernet ports. In this case, the motherboard provides basic functionality but the expansion card offers additional or enhanced ports.

(http://www.wisegeek.org/what-is-an-expansion-card.htm)

5. Mark the sentences T (true) or F (false) using the text. Correct the false ones.

a. An expansion card is a mechanic circuit boarding that adds more functionality to a desktop computer.

b. A new sound card may expand a computer's audio input.

c. The Altair 880000 was developed in the mid 1970s.

d. In 1981, IBM® launched its first PC with an XT bus, which was replaced with a 20-bit ISA.

e. One edge of the expansion card holds the contacts that fit accurately into the niche.

f. Connectors attached on the bracket permit the construction of peripheral devices to the card.

g. The main resolution of an expansion card is to supply or remove structures not offered by the motherboard.

6. Give Russian equivalents of the word combinations.

Electronic circuit board, "low-profile" cards, to perform additional functions, dual slot graphics cards, installed in backplane systems, an expansion card bus, an expansion card bus, hard drive capability, multiple RS232 ports, enhanced ports.

7. Ask questions to the underlined words.

a. Video cards and sound cards are collective cases: a new video card added will increase the three dimensional graphics processing power of a computer while a new sound card may increase a computer's audio input.

b. Laptops do not use standard cards due to their small form factor.

c. The introduction of the PCI bus in 1991 resulted in modern forms of interface adapters that provided additional benefits beyond enhanced graphics and sound.

d. Contacts form the electrical contact between the electronics (mostly integrated circuits).

e. 19 or more expansion cards can be installed in backplane systems.

f. Most graphics cards on the market as of 2010 are dual slot graphics cards, using the second slot as a place to put an active heat sink with a fan.

g. The unique IBM PC did not provide graphics or hard drive capability.

h. The motherboard provides basic functionality but the expansion card offers additional or enhanced ports.

8. Try to retell the text using the phrases for rendering:

The title of the text…
The main idea of the text...
The text is headlined…
The main idea of the text is ...
The text is about ... The article deals with ...
The text touches upon ...
The purpose of the article is to give the reader some information on ...
The aim of the text is to provide the reader with some facts/material/data on
The text describes ...
According to the text ...
Further the author reports (says) that ...
I find/found the article topical…urgent (interesting, important, dull, of no value, too hard to understand ...) because ....
In my opinion the text is worth reading because ....

9. Complete the words in the following sentences by adding the prefix *inter-, intra-, trans-, com-, con-, up- or down-*.

a. Recently computer ____time costed the company over € lO,OOO in lost production.

b. The supercomputers in the construction department have now been effectively____connected with those in the planning department.

c. Once you have ended compensation details the data will be ___mitted via a secure link.

d. We cannot link these computers because the systems are not ____patible.

e. Many corporations dispense internal documents on their own _____net.

f. Once the home page has been finished, we'll be ready to ____load the site.

g. Hawsers are being laid throughout the building as the network needs physical____nections.

h. Using the network he was able to _____bine the data from diverse reports.

10. Translate the sentences from Russian into English.

a. Карта расширения, также называемая дополнительная карта, плата расширения, внутренняя карта, адаптер интерфейса или просто карта является основой компьютера.

b. Карты расширения конструируются по разным стандартам и отличаются типом разъема (типом слота), в которые они должны быть установлены.

c. ISA– появилась на самом первом персональном компьютере IBMPC в 1981 г., в настоящее время считается устаревшей и редко встречается на новых платах.

d. PCI– появилась в июне 1992 года, на сегодняшний день это стандартная шина для карт расширения (за исключением большинства видеокарт).

e. AGP– относительно новая шина, используется только видеокартами.

f. Следует заметить, что такие устройства, как видеокарты, звуковые карты и сетевые карты, довольно часто устанавливают непосредственно на саму материнскую плату, сокращая тем самым производственные расходы.

g. Такие материнские платы, называемые интегрированными, предназначены для работы в недорогих компьютерах, выполняющих исключительно офисные задачи.

h. Есть еще компьютеры с закрытой архитектурой (например, фирмы «Apple»), где изменить базовую конфигурацию нельзя.

i. Поэтому после установки платы нужно установить управляющую программу для нее (драйвер устройства).

j. В настоящее время в компьютерах с открытой архитектурой для расширения используется шина PCI и ее разновидность PCI – e-xpress для видеокарты.

Unit 6

RAM (RANDOM ACCESS MEMORY)

1. Speaking Practice

- Look at the picture. Have you seen such device before? Try to explain it with your own words.

- Read the first paragraph of the text and find out an information about RAM.

2. Give answers to the following questions.

1. What are the main parts of computer memory? How do they work?

2. What secondary storage devices do you use in your work?

3. How much information can they hold?

4. Computer engineers consider it is possible to make multigigabyte memory chips and disks capable of storing a terabyte (one trillion bytes) of memory. Do you believe it, or do you think, memory capacity has reached an upper limit?

Picture 7. RAM

Pre-reading tasks

3. Fill the gaps with the given words:

gaming, away, RAM, games, other, 2 GB of RAM

For instance, if you're ordering a PC for full …, then you'll want sufficient … to support smooth gameplay. Having just … accessible for a game that acclaims at least 4 GB is going to result in right slow act if not entire incapacity to play your … . On the … end of the spectrum, if you use your computer for light Internet browsing and no video flooding, games, memory-intensive applications, etc., you could easily get … with less memory.

4. Read and memorize the new words. Make up your own examples with them.

Random access memory [ˈrandəm ˈaksɛs ˈmɛm(ə)ri] запоминающее устройство с произвольным порядком выборки; ОЗУ

retrieval [rɪˈtriːvl] восстановление, возвращение, исправление

cell [sel] ячейка, клетка, элемент, камера, клеточка, помещать в клетку

volatile [ˈvɒlətʌɪl] непостоянный, изменчивый, недолговечный, преходящий

regardless [rɪˈgɑːdləs] не обращающий внимания, не обращая внимания ни на что

tremendous [trɪˈmɛndəs] огромный, потрясающий, громадный

transfer [trænsˈfɜː(r)] передача, перевод, трансфер, передавать, переводить, переводный

obtain [əbˈteɪn] получать, приобретать, добиваться, достигать

capacitor [kəˈpasɪtə] конденсатор

predecessor [ˈpriːdɪsɛsə] предшественник, предок

upgrade [ˈʌpgreɪd] модернизация, подъем, модернизировать, на подъеме

Reading tasks

5. Read the text and translate it into Russian.

RAM (RANDOM ACCESS MEMORY)

Random access memory (also hyphenated as *random-access memory*), usually known by its acronym **RAM**, is a class of media used in computers for data storage and retrieval. A RAM device is designed to allow data to be read or written in any order—that is, "at random". In addition, the speed at which a set of data can be accessed is independent of its location in the device.

In today's computers, the main memory takes the form of a RAM device, which is usually an integrated containing millions of "memory cells". This memory stores software programs as well as other data that are actively being used. RAM is a volatile type of memory, where the information is lost when the power is switched off.

Random-access memory is a type of data storage for computers. Commonly known as the acronym RAM or simply memory, random-access memory details the speed in which data that is stored can be accessed at random. This means that the strength of the RAM determines, at random, how fast a piece of data can be pulled and returned. Regardless of where the data is on a drive or whether it is at all related to any previous bit of data is irrelevant; RAM pulls it back at a constant time.

RAM differs tremendous from other types of storage devices such as optical discs. These rely on the consistent movement of the medium in which data has been recorded. For example, a DVD player needs to have the DVD within to read the

data. The downside to this is that it takes longer than a data transfer, but more importantly, based on where the information is physically in relation to the previous bit of information determines the speed in which it is recovered. Because of this, RAM is faster at obtaining information than optical or magnetic discs. Their use, though, is in the fact that the data doesn't have to be stored on the actual drive.

Types of RAM

- SRAM: Static random access memory has anywhere from four to six transistors for each memory cell. Because it doesn't have a capacitor for each cell, its primary use is for caching.
- DRAM: Dynamic random access memory gets its name because it consistently needs to be refreshed. It has memory cells that have a transistor and capacitor pair.
- FPM DRAM: This is known as fast page mode DRAM which is the original type. For each process – 0 or 1 – it goes from column to column and row to row to find the data. This slow speed allows for a max of 176 MBps.
- EDO DRAM: Extended data-out DRAM goes faster than its predecessor because it doesn't wait for the first bit of data to be found before it begins finding the second bit. This means it has a max transfer rate of 264 MBps.
- SDRAM: Synchronous DRAM is the most common used RAM in today's computers. Because it understands the principle that most CPU will have the data in sequence, it stays on one row containing a needed bit and then checks each column. This increases the transfer speed up to 528 MBps.

There are faster types of RAM, but the main point is that speed is based on how the RAM finds information. Therefore, when there is more RAM in a computer, it suggests that data can be found at a great speed which begs the ultimate question: how much RAM do I need? The answer to that is simple. What are you going to do with your machine? Most people suggest getting more if it is

possible and since upgrading RAM is typically inexpensive, getting more shouldn't be looked down upon. A faster machine means things are done more efficiently.

(http://www.tech-faq.com/random-access-memory.html)

6. Answer the questions after reading the text.

a. Is RAM a class of media used in computers for data storage and retrieval?

b. How does the main memory look in today's computers?

c. Where are millions of "memory cells" situated?

d. Is RAM a volatile type of memory, where the information is lost when the power is switched off?

e. What does the strength of the RAM determine at random?

f. Does RAM differ tremendous from other types of storage devices such as optical discs?

g. What types of RAM do you know?

h. What is EDO DRAM?

i. What RAM is usually used in today's computers?

g. What does a faster machine mean?

7. Mark the following sentences true or false. Correct the false sentences.

a. **RAM** is a class of mass media used in processers for data storing and reclamation.

b. The speed at which a set of data can be accessed is dependent on its location in the means.

c. Random-access memory is a type of data storage for smartphones.

d. In spite of where the data is on a drive or whether it is at all related to any previous bit of data is irrelevant; RAM pulls it back at a constant time.

e. A DVD player does not need to have the DVD within to read the data.

f. RAM is faster at obtaining information than optical or magnetic discs.

g. SPRAM doesn't have a capacitor for each cell, its primary use is for caching.

8. Match adjectives with suitable nouns.

simple	memory
volatile	answer
main	RAM
constant	time
millions of	type
fast	memory cells

9. Complete the sentences with the phrases below.

Memory controller, thousands of times, is emptied, the bucket

A capacitor is similar to a small bucket that is capable to stock electrons. To store a 1 in the memorial cell, _____ is occupied with electrons. To supply a 0, it _____. The difficulty with the capacitor's bucket is that it has a leakage. In a matter of a few milliseconds a full bucket becomes vacant. Consequently, for dynamic memory to work, either the CPU or the _____has to come along and refresh all of the capacitors holding a 1 before they release. To do this, the memory controller reads out the memory and then writes it right back. This refresh operation happens spontaneously _____ per second.

10. Choose the correct word from the following variants.

1. The speediness with which a modem can process data is measured in ____.

a) bandwidth b) bits per second (bps) c) signal

2. Cables consisting of numerous copper wires each with a shield are known as _____ cables.

a) twisted pair b) optical fibre c) power cables

3. Mainframes that are connected together within one building form a _____.

a) WAN b) ISP c) LAN

4. If you pass a file from an isolated computer to your computer, you _____.

a) download b) upload c) run

5. To send out data is to _____.

a) signal b) packet c) transmit

6. A article containing information and graphs that can be accessed on the internet is _____.

a) a website b) a web page c) the World Wide Web

11. Translate the following sentences into English.

1. Операти́вная па́мять (англ. Random Access Memory, память с произвольным доступом) — часть системы компьютерной памяти, в которой временно хранятся данные и команды.

2. Передача данных в/из оперативную память процессором производится непосредственно.

3. Оперативное запоминающее устройство, ОЗУ — техническое устройство, реализующее функции оперативной памяти.

4. Память динамического типа (англ. DRAM Dynamic Random Access Memory) - экономичный вид памяти.

5. Для хранения разряда (бита или трита) используется схема, состоящая из одного конденсатора и одного транзистора.

6. Второй существенный минус — конденсаторы склонны к «стеканию» заряда.

7. Заряд конденсаторов для восстановления необходимо «регенерировать» через определённый интервал времени.

UNIT 7

POWER SUPPLY

Speaking Practice

1. **In pairs, discuss the picture using the conversational phrases from Units 1-3.**

Do you agree with the following statements?

Different from some hardware modules used with a workstation that isn't necessarily needed, as a copier, the power supply is a crucial part because, without it, the rest of the interior hardware can't function.

The power supply unit is frequently abbreviated as PSU and is also known as a power pack or power converter.

Motherboards, cases, and power supplies all come in diverse sizes called form aspects. All three must be compatible to work properly together.

Picture 8. Power supply

Pre-reading tasks

2. Determine the part of speech of the words and translate them into Russian.

`process – to `process – `processing – `processor, `program – to `program – `programming – `programmer – `programmable, con`trol – to con`trol – con`troller, `transfer – to trans`fer;

to `calculate – ,calcu`lation – `calculator – `calculating, to com`pute – compu`tation – com`puter – com`puting, to a`pply – appl`cation – app`liance – a`pplied.

3. Read the words and give your own examples, using them.

power supply [ˈpaʊə səˈplʌɪ] питание, электропитание, источник питания, энергоснабжение, блок питания

outlet [ˈaʊtlɛt] выход, выходной, выпускной, выпускать

overheating [ˌəʊvəˈhiːtɪŋ] перегрев, перегревание

attach [əˈtatʃ] придавать, прикреплять, присоединять, привязывать, прикладывать, связывать

cable [ˈkeɪb(ə)l] кабельный, канатный, кабель

protect [prəˈtɛkt] защищать, охранять, беречь, оберегать, предохранять

puny [ˈpjuːni] маленький, слабый, незначительный

choke [tʃəʊk] дроссель, давиться, заглушать

dissipation [dɪsɪˈpeɪʃ(ə)n] рассеяние, рассеивание, разложение, исчезновение, расточение, растрачивание

resistance [rɪˈzɪst(ə)ns] сопротивление, сопротивляемость, противодействие, резистор

potential [pə(ʊ)ˈtɛnʃ(ə)l] потенциал, возможность, напряжение, потенциальный, возможный

Reading tasks

4. Read and then translate the text into Russian.

POWER SUPPLY

A power supply is a hardware component that supplies power to an electrical device. It receives power from an electrical outlet and converts the current from AC (alternating current) to DC (direct current), which is what the computer requires. It also regulates the voltage to an adequate amount, which allows the computer to run smoothly without overheating. The power supply an integral part of any computer and must function correctly for the rest of the components to work.

You can locate the power supply on a system unit by simply finding the input where the power cord is plugged in. Without opening your computer, this is typically the only part of the power supply you will see. If you were to remove the power supply, it would look like a metal box with a fan inside and some cables attached to it. Of course, you should never have to remove the power supply, so it's best to leave it in the case.

While most computers have internal power supplies, many electronic devices use external ones. For example, some monitors and external hard drives have power supplies that reside outside the main unit. These power supplies are connected directly to the cable that plugs into the wall. They often include another cable that connects the device to the power supply. Some power supplies, often called "AC adaptors," are connected directly to the plug (which can make them difficult to plug in where space is limited). Both of these designs allow the main device to be smaller or sleeker by moving the power supply outside the unit.

Since the power supply is the first place an electronic device receives electricity, it is also the most vulnerable to power surges and spikes. Therefore, power supplies are designed to handle fluctuations in electrical current and still provide a regulated or consistent power output. Some include fuses that will blow if the surge is too great, protecting the rest of the equipment. After all, it is much cheaper to replace a power supply than an entire computer. Still, it is wise to connect all electronics to a surge protector or UPS to keep them from being damaged by electrical surges.

How to pick the best PC power supply

There is no single, universal rule for selecting a high-quality power supply. Nevertheless, various indicators provide circumstantial evidence of PSU quality, and some guidelines are generally helpful. First, always buy a power supply from a reputable manufacturer, and look for reviews of it before you buy. Avoid cheap, generic power supplies, which tend to be substandard. Look for reputable brands that offer solid warranties and support. Corsair, Seasonic, and Antec are three

manufacturers with reputations for producing high-quality power supplies, though even they may offer a few duds among all the studs. Do your homework!

Larger, heavier units are preferable to puny, lightweight models. Higher-quality power supplies almost always use bigger and better capacitors, chokes, and other internal components, and they come outfitted with larger heatsinks for superior heat dissipation—all of which translates into more weight. Larger cooling fans, which typically move more air while making less noise than smaller fans, are another plus.

Of course, you should also check the PSU's connectors to confirm the unit is compatible with your particular system. The term *20+4 pin* refers to a connector that can function as either a 20-pin connector or a 24-pin connector. In the 6+2 pin connector shown at right, you can snap two of the pins in the connector on or off to suit your needs. Another consideration is cabling. Power supplies are available with hard-wired cabling, with partially modular cabling, or with fully modular cabling. In modular power supplies, you can add or remove cabling from the PSU as needed to avoid case clutter.

Technically, a power supply with hard-wired cabling is optimal because it requires no additional connections between the unit’s internal PCB and the connector that will ultimately be plugged into one of your components. One end of the cable is soldered into the PSU’s PCB and the other end terminates in a standard connector, with no breaks in the line. Whenever you introduce an additional connection between the PSU and your components—as happens with modular power supplies—you add more resistance and another potential point of failure into the line; and any increase in resistance translates into lost efficiency.

(https://www.pcworld.com/article/2025425/how-to-pick-the-best-pc-power-supply.html)

5. Find answers to these questions from the text.

a. Is a power supply a hardware component that supplies power to an electrical device?

b. What does it receive from an electrical outlet and convert the current from AC to DC?

c. Must power supply function correctly for the rest of the components to work?
d. What are the differences between internal and external power supplies?

e. How are power supplies designed?

f. Is it much cheaper to replace a power supply than an entire computer?

g. How do people select a high-quality power supply?

h. Where do people as a rule buy a power supply?

i. What should you check to confirm the unit is compatible with your particular system?

j. Why is power supply with hard-wired cabling optimal?

6. Read these sentences and decide if they are true (T) or false (F).

a. Power supply regulates the voltage to an adequate amount, which allows the computer to run smoothly without overheating.

b. The power supply is an unnecessary part of any computer and must not function correctly for the rest of the components to work.
c. Without opening your computer, the only part of the power supply you will see.

d. If you were to remove the power supply, it would look like a plastic box with a fan inside and some cables attached to it.

e. Some monitors and external hard drives have power supplies that reside inside the main unit.

f. The power supply is the third place an electronic device receives electricity; it is also the most vulnerable to power surges and spikes.

7. Find the Russian equivalents of the following English word combinations.

internal power supply	адаптер переменного тока
another cable	внутренние источники питания
AC adaptors	другой кабель
plug	вилка
power surges and spikes	скачки и всплески напряжения
consistent power output	постоянная мощность

8. Reorder the words to make a sentence.

a. A – an – power supply – internal – component – is – hardware.

b. Power supply – in – supplies components – a – with power – computer.

c. Never – the – open of – casing – power supply – a.

d. These cables connect to each the computer – and – internal components – motherboard – other.

e. Everything – by the – within the computer chassis – is powered – contained – computer.

f. It contains – capable of holding – even if the computer is off and unplugged for a week – capacitors – a strong electrical charge.

9. Choose the correct word from the given variants.

1. The speed with which a modem can procedure data is measured in _____.

a) bandwidth b) bits per second (bps) c) signal

2. Cables consisting of a number of copper wires each with a protection are known as _____ cables.

a) twisted pair b) optical fibre c) power cables

3. PCs that are connected together within one building form a _____.

a) WAN b) ISP c) LAN

4. If you relocate a file from a remote computer to your PC, you _____.

a) download b) upload c) run

5. To refer out statistics is to _____.

a) signal b) packet c) transmit

6. A file containing statistics and graphics that can be accessed on the internet is _____.

a) a website b) a web page c) the World Wide Web

10. Translate the text from Russian into English.

Блоку питания компьютера часто отводится незаслуженно низкая значимость в глазах пользователей компьютера, особенно среди новичков. Однако его работоспособность компьютера напрямую зависит от его

стабильной работы. Давайте рассмотрим, на что стоит обращать внимание при выборе и эксплуатации блока питания компьютера. Блок питания (БП) служит для преобразования переменного тока из сети в постоянный ток различных напряжений для питания компонентов компьютерной системы. В дополнение к сказанному, блок питания обеспечивает определенную защиту от помех и участвует в охлаждении компьютерного корпуса, если расположен в его верхней части.

От его качества и стабильности характеристик напрямую зависит работоспособность компьютера. Очень часто в различных неисправностях вроде бы связанных с другими компонентами компьютера виновен блок питания компьютера. У него может не хватать мощности в определенные моменты, так как со временем характеристики электронных компонентов ухудшаются или вы установили в систему новые комплектующие, например, дополнительную память. Так же следует помнить, что дешевые блоки питания от неизвестных производителей на практике выдают гораздо меньшую мощность, чем написано на их этикетках.

UNIT 8

KEYBOARD

Speaking Practice

1. What do you know about keyboard? In pairs, discuss the picture.

2. Match the words and use them in your speech.

1. along with 2. however 3. therefore 4. prior to 5. thus 6. since 7. eventually 8. as well as 9. although 10. increasingly 11. due to

a. так как b. поэтому c. все больше и больше d. благодаря e. таким образом f. хотя g. наряду с h. в конечном счете (со временем) i. до (прежде) j. однако k. также как

3. **Read these statements. Do you agree with them?** Use conversational phrases from the units 1-3 to express your opinion.

You connect with your computer with the control panel.

With it, you type instructions and instructions for the computer, and information to be processed and stored.

Many of the keys on the keyboard are like that typewriter; letter keys, punctuation keys, shift keys, tab, and your keyboard also has many specialized keys.

Picture 9. Keyboard

Pre-reading tasks

4. Match the words with their definitions.

1. Esc, 2. Alt, 3. Ctrl, 4. Pgdn, 5. Pgup, 6. Ins, 7. Del

a. Alternative, b. Page Up, c. Delete, d. Insert, e. Escape, f. Page Down, g. Control

5. Put the titles of the keys in the right order. Number them from 1 to 7.

- Insert
- F1
- Comma
- Plus
- Print screen
- Delete
- Escape

6. Read and memorize the new words. Make up your own examples with them.

keyboard [ˈkiːbɔːd] клавиатура, клавишная панель, набирать на клавиатуре
typewriter [ˈtʌɪprʌɪtə] машинописный шрифт; шрифт, напоминающий машинописные буквы, машинка
bar [bɑː] бар, полоса, штрих
portability [ˌpɔːtəˈbɪlɪti] возможность, маневренность
infrared [ɪnfrəˈrɛd] инфракрасный, область инфракрасного излучения, инфракрасная область
keypad [ˈkiːpad] кнопочная панель или консоль, вспомогательная клавиатура, специализированная клавиатура
configuration [kənˌfɪgəˈreɪʃ(ə)n] конфигурация, форма, очертание
battery [ˈbat(ə)ri] батарея, аккумулятор, батарейка
lithium [ˈlɪθɪəm] литий
wrap [ræp] упаковывать, обертывать, заворачивать

clutter [ˈklʌtə] перегружать, беспорядок

Reading tasks

7. Read the text and translate it into Russian.

KEYBOARD

A computer **keyboard** is one of the primary input devices used with a computer that looks similar to those found on electric typewriters, but with some additional keys. Keyboards allow you to input letters, numbers, and other symbols into a computer that can serve as commands or be used to type text. As the name implies, a keyboard is basically a board of keys. Along with the mouse, the keyboard is one of the primary input devices used with a computer. The keyboard's design comes from the original typewriter keyboards, which arranged letters and numbers in a way that prevented the type-bars from getting jammed when typing quickly. This keyboard layout is known as the QWERTY design, which gets its name from the first six letters across in the upper-left-hand corner of the keyboard.

What is a Wireless Keyboard

A wireless keyboard is a regular keyboard that is not connected to your computer by any cables. Instead, wireless keyboards use either radio waves or infrared laser technology to connect to a wireless adapter that is plugged into the computer's USB port. Wireless keyboards offer portability and flexibility to the user as the user can move the keyboard around without having to keep it directly on a desk.

Advantages

Portability

The main advantage of using a wireless keyboard rather than a regular keyboard is that it offers much more mobility. A wireless keyboard can be used on a lap, in a bed, or just used while on-the-go for laptop users. All wireless keyboards use either radio waves or infrared to communicate with the wireless adapter that

usually comes with the keyboard. The keyboards that use radio waves have much more flexibility as they do not need to "see" the wireless adapter. Wireless keyboards that use infrared, however, need to be in a direct viewing range of the wireless adapter – much like a TV remote.

Lack of clutter

The other advantage of a wireless keyboard is that there is a lot less clutter involved compared to a regular keyboard. While regular keyboards generally have a long cable that has to be wrapped around other things to fit on the user's desk, a wireless keyboard just sits wherever the user puts it and communicates with the wireless adapter without using any cables whatsoever. Wireless keyboards can also be moved out of the way when the user wants to use their desk for other things such as paperwork.

While wireless keyboards offer mobility and lack of clutter, they tend to be slower than regular keyboards. Computer users who type at a fast rate may experience problems with their wireless keyboard as it may hesitate to register keystrokes or not register some keystrokes at all. The majority of wireless keyboard users do not report any problems with this but it is something to consider before purchasing a wireless keyboard.

Configuration

Another disadvantage of using a wireless keyboard is that it has to be installed and configured before it can be used. Regular keyboards, on the other hand, run on Plug and Play software and work immediately after they are plugged in. The majority of users will not have a problem with the configuration but some users, particularly those with limited technical skills, may have a problem setting up their wireless keyboard.

Batteries

Another thing to consider before purchasing a wireless keyboard is that it operates on battery power rather than using electricity from the user's computer.

Most wireless keyboards use four AA lithium batteries so the user does not have to worry about finding special batteries but they will need to be replaced regularly. Some models of wireless keyboards have a longer battery life than others with the average generally being between six and fifteen months. While this sounds great, the user will need to make sure that they always have spare batteries or a regular keyboard nearby so that their wireless keyboard does not spontaneously stop working.

Limited Models

The final disadvantage to consider before purchasing a wireless keyboard is that there are limited options on models. Wireless keyboards are still rather new to the market so many of them are expensive and contain a lot of extra features that are not needed and are only added so that manufacturers can raise the price. The user should consider whether or not they really need a wireless keyboard and, if so, what features are desired in a wireless keyboard. The best option would probably be to purchase a used wireless keyboard from Amazon or eBay.

(http://www.tech-faq.com/wireless-keyboards.html)

8. Find answers to these questions from the text.

a. Why do people use keyboard?

b. Is keyboard an input device?

c. What can you say about QWERTY design?

d. Do wireless keyboards offer portability and flexibility to the user?

e. What are the advantages of wireless keyboard?

f. What are the differences between regular and wireless keyboards?

g. What energy do the wireless keyboards use?

h. Why can wireless keyboard stop working?

i. What are the disadvantages of the wireless keyboards?

j. Do wireless keyboards contain a lot of extra features that are not needed and are only added so that manufacturers can raise the price?

9. Match the words with their definitions.

shift key, alt key, control key, escape key, delete key, tab key, caps lock key, backspace key, standard keyboard, ergonomic keyboard, key in (or type in), enter, data input

a. To go back one space, hit the _____.

b. To alter to capital letters, press the _____.

c. To change the capital letters enduringly, hit the _____.

d. To inset a tabulation, press the _____.

e. To activate the "Ctrl" functions, press the _____.

f. To make active the "alt" functions, hit the _____.

g. To end the computer doing something, you can press the _____.

h. Select the text you want to remove, and hit the _____.

i. Please _____ your password.

j. It took me two hours to _____ all that text.

k. A keyboard is a _____ device.

l. Do you have a _____? No. I have a different _____. It's better for my arms and back.

10. **Translate the text from Russian into English.**

Классическая компьютерная клавиатура обычно имеют 102 клавиши. Современные клавиатуры, как правило оснащены дополнительными клавишами. Дополнительные клавиши используются для управления

мультимедиа-проигрывателями, для навигации в интернет-браузерах, запуска приложений и т. д.

Ход клавиш - расстояние, которое проходит клавиша при нажатии до момента соприкосновения контактов. Для беглой печати обычно выбирают клавиатуры с небольшой длиной хода (3 мм и меньше).

Передача данных от беспроводной клавиатуры к компьютеру происходит через ресивер. Отсутствие лишних проводов делает работу более комфортной, а также позволяет экономить место на рабочем столе. Питание беспроводных клавиатур осуществляется от аккумуляторов или батареек, которые требуют регулярной подзарядки или замены.

UNIT 9

HARD DISK DRIVE

Speaking practice

1. Agree or disagree with the statements:

Hard disk is a inflexible disk coated with magnetic material, for storing courses and quite large amounts of data.

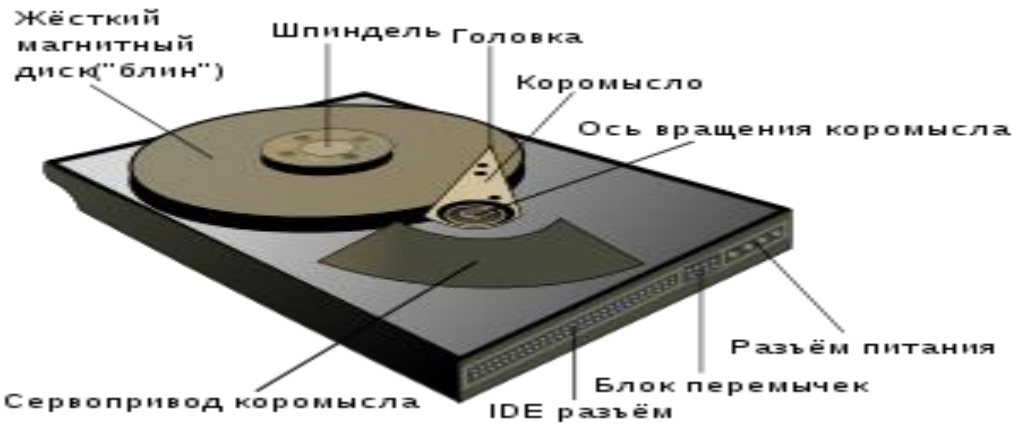
Unlike the floppy drive, the hard disk drive is inside the computer's case and you cannot see it. Usually it is referred to as drive C.

Hard drives also hold a lot of data. The smallest hard drives Gateway 2000 offers hold more information than 100 floppies! The size of a hard drive is measured in megabytes, or MB for short.

2. Answer the questions before reading the text.

1) Without what parts is computer unable to work? 2) What is the most expensive part of the hardware? 3) What other hardware devices do you know? What are they for? Do you know how to use them?

Translate the details of hard disk into English.



Picture 10. Hard disk drive

Pre-reading tasks

3. Match the words with their definitions.

joystick, light pen, scanner c input sound, digital camera, mouse, keyboard, microphone, produce photos without films

draw pictures on to a computer screen, copy documents, input sound, input text, select from a menu, move the cursor rapidly, produce photos without films

4. Translate the sentences into Russian.

The hard disk drive inside your PC is like a filing cupboard. It's a appealing significant part of your laptop. A hard disk drive generally contains a number of disks. The drive motor twists the disks very quickly. It runs all the time your PC is in use. There's a hole, a space, between each disk. We need the gaps so the read/write heads can move across the disk and reach all parts rapidly. The head motor controls the read/write disks. The space between the head and the disk surface is miniature.

5. Read and memorize the new words.

hard disk drive [hɑ:d dɪsk drʌɪv] дисковод для жёстких дисков; жесткий диск

platter [ˈplatə] граммофонная пластинка, тарелка

erase [ɪˈreɪz] стирать, подчищать, вычеркивать

magnetic [magˈnɛtɪk] магнитный, магнетический, притягивающий

sealed [si:ld] запечатанный, герметичный, герметизированный

air-vent [eə vent] вытяжка, вентиляция

rotate [rə(ʊ)ˈteɪt] вращать, вращаться, чередовать, колесовидный

retrieval [rɪˈtri:vl] восстановление, возвращение, исправление

format [ˈfɔ:mat] формат, форма, размер, формат книги, форматировать, оформлять

boot [bu:t] загрузить

partitioned [pɑ:ˈtɪʃənd] разделена

Reading tasks

6. Read the text and translate it into Russian.

HARD DISK DRIVE

Hard drive, also known hard disk or hard disk drive, is a non-volatile data storage device. Technically, hard drives and hard disks are not the same since hard drives consist of multiple hard platters, the hard disk reader and writer head, the hard drive motor, and the drive electronics. On the other hand, a hard disk is the storage medium itself.

The hard drive was invented in mid-20th century. Its earliest versions were mainly used in computers and could only store around five megabytes of data. Now, hard drives have applications in photography, videography, and mobile computing and communications technology, and currently, a hard drive that can store up to 1 terabyte or 1024 Gb of data is being developed.

The Hard Disk

A hard disk stores data the same way a cassette tape does, through a magnetic storage technique. This makes data stored on a hard disk very easy to erase, revise and replace. Moreover, the magnetic recording patterns are stored on a hard disk for a long time. As such, the only way to definitely erase data that has ever been stored on the disk's magnetic surface is to physically destroy the disk.

Physical Characteristics

The hard drive is a simple, tightly sealed aluminum box that has a filtered air-vent. Inside the box are electronics that direct the read/write head or heads held aloft by a spindly arm and controls the motor which rotates the hard platters. The hard drive's driver electronics contains the instructions for converting bytes into magnetic domains when data is being recorded onto the hard disks and for translating magnetic patterns into bytes when data is requested by the CPU.

Features

The hard disk has a magnetic material, usually a cobalt-alloy, which is overlaid on a glass or aluminum disk. The whole assembly is polished until it attains mirror-like smoothness. Data stored on the hard drive's hard disks can be accessed almost instantaneously. In the process of recording data, the read/write head merely hovers above the disk's magnetic surface. Moreover, in the process of data retrieval or recording, the hard platter spins beneath the read/write head with speeds of around 170 miles per hour. Because of the great rotation speed, data is stored in significantly small regions of magnetic space. This, coupled with the number of hard disks used, makes a hard drive capable of storing enormous amounts of data.

Data Storage Mechanism

The magnetic surface of hard platters in a hard drive is formatted into tracks (concentric circles) and sectors (pie-like wedges on individual tracks) which can

hold a fixed number of bytes. When data needs to be recorded, the hard disk platters rotate at great speeds and passes underneath the hard drive read/write head. The magnetic head produces a magnetic field which magnetizes the corresponding region where data is supposed to be stored. During this process, the surface acquires a magnetic flux or pattern representative of the information being stored.

Formatting a hard drive often becomes necessary when Trojans or viruses that are difficult to remove infect it or when there are bad sectors on it.

A hard drive should be divided into small partitions to utilize the space effectively. A hard drive can also be formatted in order to reorganize the space available. Remember, formatting the hard drive or any of its partitions will completely erase all data. This article gives the steps to correctly go about the formatting exercise.

Reformatting a Hard Drive with the Windows Installation Disk

1. First and foremost, backup all the data from the hard drive partitions to be formatted. For example, users may want to backup their 'Documents and Settings' folder so that they can use it on a new Windows installation. Also remember to backup other important items like the Internet browser bookmarks.
2. Restart the PC and enter the BIOS setup by pressing the 'Delete' key. Once in the setup, ensure that the boot configuration is set to allow the CD/DVD drive to boot first.
3. Insert the Windows installation disk in the drive and then exit the setup after saving the changes.
4. As the machine restarts, the user will be prompted to press any key to boot from the disk. It is important to boot from the disk because the system partition cannot be formatted from the operating system itself.
5. The Windows installation screen should take the user through several steps before he/she is allowed to format an existing drive.

6. Reformat existing partitions, delete existing partitions, or create new partitions in unpartitioned space. Choose the required amount of space by specifying a number denoting the formatted area in megabytes.
7. Choose NTFS or FAT32 for formatting. NTFS drives are faster, superior, and more secure.

(http://www.tech-faq.com/hard-drive.html)

7. Mark the sentences True or False.

a. Is a hard disk the storage medium itself?
b. When was the hard drive invented?
c. How much information can hard drive store?
d. What physical characteristics does it have?
e. Is it necessary to format the hard drive?
f. Will formatting the hard drive or any of its partitions completely erase all data?
g. Why is it important to boot from the disk?
h. How can the Windows installation help the user to format an existing drive?
i. Shall we reformat existing partitions, delete existing partitions if we are reformatting a hard drive?
j. Are NTFS drives faster, superior, and more secure?

8. Reorder the words to make a sentence.

a. The – and the disk – space –is – between the head – surface – tiny.
b. There – a gap, a – each – space – is – between – disk.
c. A hard – disk – normally several drive – disks – holds.
d. Hard disk is a rigid disk – magnetic material – for storing – somewhat large – amounts of data – coated with – programs and.
e. The drive – the disks – quickly – motor spins – very.
f. On the – hand, a hard – is the storage – medium itself – other – disc.

9. Circle the letter or fill in the correct answer.

1. RAM is referred to as _____ storing.

a. direct b. optical c. nonvolatile d. secondary

2. ____ actions how much a definite storage medium can hold.

a. access speed b. memory c. capacity d. storage

3. How tightly the bits can be packed next to one another on a disk is referred to as_____.

a. tracks b. density c. sectors d. configuration

4. Dense, stiff metal plates that are capable of storing and retrieving data at a high rate of speed are known as _____.

a. hard disks b. flash memory c. soft disks d. SAN

5. The data on an optical disc is represented by regular areas called _____ on the disc surface.

a. surfaces b. lands c. flats d. pits

6. DVD means _____.

a. digital video data b. digital versatile disc c. direct video disc d. direct versatile disc

7. _____ is the hi-def standard.

a. Blu-ray b. DVD + R c. CD-ROM d. Max RL

8. In other words USB drive is _____.

a. flash drive b. optical drive c. floppy drive d. solid metallic drive

9. Online storage is also known as _____ storage.

a. Blu-ray b. DVD c. cloud d. optical

10. Particular high-capacity secondary storage device designed to meet organizational demands for data is _____.

a. Blue-ray Disc b. mass storage c. hi def d. floppy disk

10. Translate the text into English.

Представленный IBM в 1956 году, жесткий диск стал доминирующим вторичным устройством хранения данных для компьютеров общего назначения в начале 1960-х годов. Постоянно совершенствуясь, жесткие диски сохранили эту позицию в современную эпоху серверов и персональных компьютеров. Более 200 компаний производили жесткие диски исторически, хотя после обширной индустрии консолидации большинство производства у Seagate, Toshiba и Western Digital. По состоянию на 2016 год, производство HDD (в байтах в год) растет, хотя и единичные поставки и доходы от продаж сокращаются. Основная конкурирующая технология для вторичного хранения флэш-памяти в виде твердотельных накопителей (SSD), которые имеют более высокие скорости передачи данных, более высокую поверхностную плотность хранения, более высокую надежность, и намного более низкое время ожидания, и время доступа. В то время как SSD-накопители имеют более высокую стоимость передачи одного бита, SSD-накопители заменяют жесткие диски, где скорость, потребляемая мощность, малый размер, и долговечность имеют важное значение.

UNIT 10

MOUSE

Speaking Practice

1. Answer the following questions.

What does toy look in this picture? Is the device necessary? How does it work? What are the examples of input hardware? What is the most expensive part of the hardware?

Picture 11. Mouse

2. Try to give definitions to the following words using the vocabulary of all the previous units.

CPU ROM, CD-ROM, printer, motherboard, hard disk, keyboard, mouse, sound-card.

Pre –reading tasks

3. Give antonyms of the words:

Internal, quick, appear, stable, to turn off, low, new, permanent, to input, to decode, wireless, many, to write to, late, turn on, input, long, comfortable, static, driver, storage, metallic, device, standard, store, inside, digital, invention, complete, amplify, collect, merge, propose, advantage, invisible, reduce.

4. Give English equivalents for the following word combinations.

Магнитный носитель, двойной щелчок, определять общую производительность, перетаскивание элемента, пульт дистанционного управления, внешняя память, коврик для мыши, электронные микросхемы, левая кнопка мыши, отыскивать (извлекать) информацию с диска, плоская поверхность, винчестер, входящий в состав компьютера, хранение, пластина, ось, формат, подключение, повышенное энергопотребление, главная характеристика, большие обороты вращения.

5. Read and memorize the new words. Make up your own examples with them.

transmitter [tranzˈmɪtə] передатчик, радиопередатчик, отправитель, микрофон, телепередатчик

frequency [ˈfriːkw(ə)nsi] частота, частотность, частое повторение, частотный

click [klɪk] щелчок, защелка, щелканье, щелкающий звук, щелкать

decode [diːˈkəʊd] декодировать, расшифровывать, раскодировать

install [ɪnˈstɔːl] устанавливать, монтировать, вселить, помещать

master [ˈmɑːstə] главный, основной, ведущий, управлять, владеть

range [reɪn(d)ʒ] диапазон, ряд, пределы, простираться

interference [ɪntəˈfɪər(ə)ns] помехи, вмешательство, интерференция, интерференционный

cord [kɔːd] ядро, шнур, корд, перевязывать

pairing [ˈpɛərɪŋ] соединение

hopping [ˈhɒpɪŋ] перескоки, скачкообразный

Reading tasks

6. Read and then translate the text into Russian.

HOW A WIRELESS MOUSE WORKS

The mouse is an extremely popular device. While the majority of mice are connected directly to the computers peripheral input via a cord and the computer's main power powers it, wireless mice are becoming extremely popular as they give computer users cordless accessibility to their mice and their computer.

Wireless Mouse Technology. Wireless mice usually work via radio frequencies commonly referred to as RF. RF wireless mice require two components to work properly – a radio transmitter and a radio receiver.

RF Transmitter. A radio frequency (RF) transmitter is usually integrated inside the mouse. The mouse records its movements and buttons that are clicked and then sends this information via radio signals to the receiver.

RF Receiver. The radio frequency (RF) receiver usually connects to the computer's peripheral mouse input. It receives these RF signals, decodes them, and then sends these signals directly to the computer as normal. RF receivers usually come in a few styles. The majority come as built in components that connect to the mouse input, others come as a separate card that is installed in one of the many expansion slots of computers, and the third type of receiver is a separate unit that is connected to a cable going directly to the computer's peripheral input. Since the technology has been mastered, most wireless mice have integrated receivers that plug into a computer's peripheral input and are very small in size.

RF Frequencies. Wireless mice mainly use Radio frequencies to transmit data from the mouse to the computer. Earlier mice operated at a frequency of 27 Mhz, which had limited range. Newer mice operate at 2.4 Ghz which gives them greater range, about 100 to 150 feet. These frequencies are very stable and usually have little or no interference in a work or home environment. Pairing and the use of multiple channels helps avoid any interference with other wireless mice.

Bluetooth RF. Another technology that is emerging and is used in wireless mice is Bluetooth RF technology. Bluetooth is commonly known to connect computers to peripherals such as keyboards, printers, PDAs, and headsets. Bluetooth is similar to 802.11b and 802.11g in that it uses 2.4 gigahertz frequencies. However, it also uses software called adaptive frequency hopping to choose frequencies that have no or little interference. Sometimes 802.11b and g receive interference from home appliances such as microwave ovens and cordless telephones. Bluetooth also has decent range, usually about 33 feet.

Advantages of Wireless Mice. RF wireless mice are a great technology because of their overall reliability and stability. Other forms of communication such as Infrared technology need to be in "line of sight" in order to work properly, which makes using them with a mouse impractical.

Some of the reasons that RF technology is great for wireless mice includes the fact that the RF transmitter housed in the mouse requires low power. Usually, RF wireless mice are powered by small, light weight batteries that are either disposable or usually rechargeable with an included recharging dock.

RF wireless mice are also inexpensive. Wireless mice are available for less than $50 and even as low as $25. RF wireless mice are lightweight, so users can move them comfortable and easily.

As with most mice on the market today, wireless mice use optical sensor technology rather than the earlier track-ball system. Optical technology improves accuracy and lets the user use the wireless mouse on almost any surface – an important feature when not tied to the computer by a cord.

Three Types of Wireless Mice

Today, there are three different types of mice – mechanical, optical, and laser. Mechanical mice use a small rubber ball to calculate distance and position. However, these mice are very rarely manufactured due to the fact that they get dirty

easily and are slow to process information. Optical mice are the de facto standard for mice today. They use optical light to calculate distance and position. They are extremely inexpensive, extremely reliable, and process information quickly.

A new technology that is out is Laser Mice. Instead of optical light, they use laser light to precisely calculate movement and position. They are extremely precise and reliable and process information extremely quick. Most gamers use Laser Mice because of their high performance. However, they are much more expensive than optical mice.

Security and Mouse Set Up

Pairing. Pairing is the process of coordinating the mouse's transmitter with its receiver. It requires both parts to operate on the same frequencies, usually by using the same identification code. Pairing takes place to try to eliminate interference. Some devices automatically pair both devices at start up, while others need to be manually paired.

Security. Security is always an issue when sending information over the air. Most mice effectively secure information by encrypting data. Other methods include frequency hopping to prevent hacking or eavesdropping.

(http://www.tech-faq.com/how-a-wireless-mouse-works.html)

7. After reading the text, answer the following questions.

a. How are mice connected directly to the computers?

b. Why are wireless mice becoming popular?

c. Do wireless mice usually work via radio frequencies commonly referred to as RF?

d. What do RF wireless mice require in order to work properly?

e. Where is radio frequency (RF) transmitter usually integrated?

f. Does mouse get RF signals, decode them, and then send these signals directly to the computer?

g. Why do wireless mice mainly use Radio frequencies?

h. Are RF wireless mice expensive?

i. Are laser mice precise, reliable, and process information extremely quickly?

j. How can mouse secure information?

8. Mark the following sentences True or False. If they are false, correct them.

a. Wireless mice are not widespread as they do not give computer users cordless accessibility to their mice and their computer.

b. Newer mice function at 10 Ghz which gives them greater range, about 200 to 150 feet.

c. The use of multiple channels helps to avoid any interference with other wireless mice.

d. Display also uses software called adaptive frequency hopping to choose frequencies that have no or little interference.

e. RF wireless mice are lightweight, so users can move them easily.

f. Office workers use Laser Mice because of their high performance.

g. Hard disk drive needs both parts to operate on the same regularities, usually by using the same identification encryption.

9. Complete the sentences with the given words.

pointer, on, optical, roll, scroll up, scroll down, touchpad, left button, right button, joystick, single, double scroll wheel, hold down, repetitive strain injury

a. _____ to see pages above.

b. _____ to see pages below.

c. To choose text, _____ the left button, and move the mouse pointer.

d. If you use a mouse for many hours every day, you can acquire _____ in your fingers.

e. With a laptop computer, plug in a mouse, or use the _____ in front of the keyboard.

f. Sasha plays some games, he needs a _____ instead of a mouse.

g. To be able move up and down a page, you should _____ the mouse wheel.

h. This mouse doesn't have a ball. It's an _____ mouse.

i. One click of a mouse button is called a _____ tick.

j. Two clicks of a mouse button are called a _____ click.

k. Click _____ the file to open it.

10. Translate the text from Russian into English.

Принципы работы современной компьютерной мыши были сформулированы и впервые реализованы в 1940-ых годах прошлого века – устройство управления, использующее шар для боулинга в качестве элемента для определения координат объекта в режиме реального времени. Однако ученые не проявили интереса к подобным изобретениям, и разработка данной идеи была отложена еще на 20 лет.

Появление первой реальной компьютерной мыши произошло лишь в 1962-ом году. Идея о создании мыши возникла у ученого Дугласа Энгельбарта еще в конце 50-х г.г. прошлого века, который, работая в то время в лаборатории NASA в области проектирования радарных установок, счел неэффективными действующие методы работы. Например, Энгельбарт счел

необходимой прямую подачу команды с ЭВМ – для этого были необходимы монитор и устройство ввода информации.

И только спустя 14 лет такое устройство ввода данных действительно появилось – это была деревянная мышь, громоздкая и не слишком удобная, однако отвечающая всем техническим требованиям своего времени. Её создателем стал Билл Инглиш, а Джефф Рулифсон написал программное обеспечение, необходимое для демонстрации технических возможностей мыши. Ученые NASA не оценили данное изобретение по достоинству, так как для его работы требовалось гравитационное поле, а, следовательно, применить подобное устройство в космосе было невозможно.

Appendix

TEXT 1

Memory (RAM)

The memory holds “short term” information for the processor to use. This may be a program or a set of data. The processor is able to retrieve information from the RAM at very high speeds. When the processor needs information that is not in the RAM, it has to read the information from the hard drive, which is much slower. The RAM modules are slotted into the RAM slots, which are next to the processor socket on the motherboard.

DDR3 models are the newest type of RAM. It doubles the speed of data transfer between the RAM and CPU compared to the old DDR model. Make sure that the RAM is compatible with the motherboard.

Video Card (GPU – Graphics Processing Unit)

The video card sends the visual output that a program produces to the monitor, which displays it on the screen. For gamers and others who use very high end graphics or special video work regularly, the GPU is the most expensive part of the computer. These cards also run very hot and most have a fan on the side.

To get the best performance from a video card, a PCI-Express or an AGP slot is needed. If it is used on a normal PCI slot, it will run much slower. Most video card manufacturers provide a benchmark figure of speed. GPUs also carry on board RAM, the more the better. Make sure that the card has driver support for OpenGL and Direct3D. These are subsystems that are used in games and other online applications. Video cards also come with a refresh rate. This shows how many times the monitor refreshes each pixel. The higher the refresh rate, the better. Lower refresh rates tend to give people headaches.

DVD/CD Drive

CD and DVD drives allow the computer to read and burn CDs and DVDs. DVDs hold a lot more data than CDs. Different kinds of CDs and DVDs can be rewritten or played on a DVD player.

Make sure that the drive has a high access time. Access time is the actual time required for the CD or DVD drive to locate a specific file on the disc.

Just like a hard drive, the CD/DVD drive uses a special set of on board RAM modules. The larger the cache, the fewer data transfer interruptions.

Some kinds of CDs/DVDs burn and rewrite CDs and DVDs. This is not necessary, but a good feature to have.

Hard Drives

The hard drive is where all the information and programs on the computer are stored. The faster the rpm (revolutions per minute) of the platters (spinning discs in the hard drive that store data magnetically) in the hard drive, the faster it can read and retrieve data. The main concern about hard drive is the amount of space. Typical hard drives are around 100 GB.

Storage capacity is the biggest concern with hard drives. The more storage capacity, the more that can be stored on the hard drive. Users should choose a hard drive with a storage capacity that meets their needs.

Access time in a hard drive measures how fast the drive can read and write data. Choose a hard drive that has an access time of at least 10ms. RPM measures how fast the platters in the hard drive are moving. Choose a hard drive with a high RPM. Common RPMs are 7200 and 10,000.

The hard drive’s cache stores data that is used frequently. The larger the cache, the less information the hard drive has to re-read each time it is opened.

Floppy drive

Floppy discs are being used less because they are unreliable and have a very short life span. The floppy drive is optional.

Monitor

Monitors are available in different size. The most common sizes are 17, 19, and 21 inches. This is measured diagonally. They display what is being done on the computer.

Size is the main thing to consider when buying a monitor. Most monitors today have a flat screen. This makes the image much clearer. Also try to find a monitor that decreases the amount of electromagnetic radiation created.

Mouse and Keyboard

A mouse controls the cursor on screen. Wireless and optical mice are used more because they are more accurate. Try to stick with optical mice because they have a longer lifespan. Trackball mice get dirty and need cleaning every once in a while.

Keyboards allow the user to type on the computer. Most keyboards today have 103 keys, but some have extra buttons that the user can program to do what he/she wants. Most users want a 103 keyboard. There are some ergonomic keyboards that shape the hand and make typing easier, this is just a preference.

TEXT 2

Keyboard

Many people install security features on their computer in order to prevent unauthorized users from accessing the computer when they are away. For example, login identification, file encryption, and even biometric identification are all sufficient methods of keeping intruders out of someone's personal information. However, some users may wish to go even further by locking their keyboard in order to prevent unauthorized users from entering a password, children from playing with the keyboard, or pets from unknowingly typing when climbing on

keys. There are several ways to lock a keyboard and both software and physical locks are outlined below.

ToddlerKeys

ToddlerKeys is a program that an actual father designed to keep his daughter from accessing his files and/or disrupting his computer. ToddlerKeys is a good program for keeping children off their parents' computer and it doubles as a privacy program that blocks anyone from accessing important personal files. ToddlerKeys can disable a keyboard, mouse, hard drive(s), sleep button, and power button. Instead of allowing access to the user's files, ToddlerKeys plays a WAV audio file and displays user-defined pictures whenever a key is pressed. The user can also specify how long the computer may remain idle before ToddlerKeys locks these devices. In order to return the computer to its normal state, the user must simply type "Quit" or a password that he/she created.

KidKeyLock

KidKeyLock is a program that is similar to ToddlerKeys that does virtually the same thing. While running, KidKeyLock displays a small icon on the Taskbar tray. When the user clicks on this icon, KidKeyLock is displayed in the form of a list. From this list, the user can choose to turn individual computer features on or off. For example, KidKeyLock is capable of turning off individual mouse buttons, all mouse buttons, the keyboard, and specific sets of keys. The user also has the ability to set a password.

Physical Lock

This is when someone uses an actual lock to physically prevent a user from pressing keys on a keyboard. Most physical keyboard locks are constructed from a box-like plastic object and encase the entire keyboard. With a physical lock, users are not able to press keys because the keys themselves are not accessible. Generally, physical keyboard locks use either a padlock or a wafer lock.

TEXT 3

OPTICAL DISC DRIVE

An optical drive is a piece of equipment that uses a laser to read or write information on a disc. Though this type of equipment is often associated with computers, it can stand alone as an appliance. For instance, a Digital Versatile Disc (DVD) player, Blu-ray disc (BD) player, and Compact Disc (CD) players are considered optical drives even though they may not be in a computer system. Many video games also use this type of device to read the game's disc. Despite what type of disc they read or write, all these applications have the same basic workings.

The optical path makes an optical drive work. The optical path is composed of three components: a laser, a lens, and a photodiode. The laser writes and reads the data. The lens guides the laser across the surface of the disc. Lastly, the photodiode detects light reflected off the disc's surface. The drive also uses two servomechanisms, or servos — one to maintain the proper distance between the disc and laser and the other to make sure the laser is moving in a continuous spiral path.

HVD (Holographic Versatile Disc) is the next generation in optical disk technology. HVD is still in a research phase that would phenomenally increase the disk storage capacities over the currently existing HD DVD and Blu-ray optical disk systems. According to published statistics, when produced in full scale, HVDs will have a storage capacity of 3.9 terabytes (39,000 GB) and a data transfer rate of 1 GB/s, which is at least six times more than the speed of DVD players. This would, without a doubt, become a giant step in revolutionizing the disk storage industry.

Some industry experts call HVDs a next-next generation technology. This inference is a direct reference to the enormous storage capacity HVDs offer compared to HD DVD and Blu-ray optical disk systems, both of which are yet to replace DVDs for mass optical storage. HD DVD and Blu-ray optical disk systems

offer a storage capacity of 75 and 90 GB respectively, but neither comes anywhere near the massive storage capacity of HVD.

HVD Technology

HVD uses a technology called 'collinear holography', in which two laser rays, one blue-green and one red, are collimated into a single beam. The role of the blue-green laser is to read the data encoded in the form of laser interference fringes from the holographic layer on the top, while the red laser serves the purpose of a reference beam and also to read the servo info from the aluminum layer – like in normal CDs – near the bottom of the disk. The servo info is meant to monitor the coordinates of the read head above the disk (this is similar to the track, head and sector information on a normal hard disk drive).

How do the laser beams selectively pass through the layers? A layer of dichroic mirrors that exists between the holographic and servo data layer reflects back the blue-green laser beam, letting only the red laser pass through it to reach the servo information. By doing so, it actually eliminates the possible chances of the interference that can happen due to the refraction of blue-green laser off the servo data pits, a problem that had affected the efficiency of many holographic storage media in the past.

Optical Storage

Most optical storage devices, such as a standard CD (Compact Disc), save one bit per pulse. HVDs manage to store 60,000 bits per pulse in the same place, in a truncated cone shape, that has a diameter of 500 micrometers at the top and 200 micrometers at the bottom. The HVD Alliance is trying to improve the storage capacity further to touch its dream 3.9 TB mark by inserting a larger number of cones on each track.

Competing Technologies

In addition to HDV, other proprietary standards are making advances optical disk technology. Other players exist, such as those made by Hitachi Maxell Ltd and InPhase Technologies. Tapestry Media – a holographic format patented by InPhase Technologies – having a storage capacity of 1.6TB and a data transfer rate of 120 MB/s is one such device, while similar a 300 GB disks with a data transfer rate of 20 Mbit/s is in the pipeline for Hitachi Maxell Ltd.

HVD Capacity

- The entire US Library of Congress can be stored on six HVDs, assuming that every book has been scanned in the text format. The Library of Congress is the largest in the world and contains over 130 million items.
- The pictures of every landmass on Earth – like the ones shown in Google Earth – can be stored on two HVDs.
- With MPEG4 ASP encoding, a 3.9 TB HVD can hold anywhere between 4,600-11,900 hours of video, which is enough for non-stop playing for a year.

HVD Adoption

The biggest challenge for HVD will be in establishing itself in the commercial market, which as of now seems to be a distant dream, given its higher cost margins. It is anticipated that a single HVD, when commercially available, may cost anywhere between $100-120 (by 2006 year's end), and the reader will be priced anywhere in the range of $10,000 to $15,000. However, like anything else associated with technology, the price will soon fall as R&D costs are recouped and competitions lowers profit margins.

(http://www.tech-faq.com/hvd.html)

GLOSSARY

-A-

accept 1. ввод (с клавиатуры); 2. согласие в сетевых протоколах; 3. одобрять, принимать;

accept all принять все

acceptor акцептор (получатель сообщения)

accesories 1. вспомогательные программы (Microsoft Paint, Microsoft Word Pad); 2. дополнительные устройства (модем, мышь, сканер), предназначенные для улучшения работы операционной системы или персонального компьютера

access 1. выборка; 2. доступ; обращение queued access доступ с очередями; random access произвольный (прямой) доступ; sequential access последовательный доступ; zero access быстрый (мгновенный доступ); remote (**distant) access** теледоступ, дистанционный доступ; direct memory access прямой доступ в память; access to the network device is denied доступ к сетевому устройству невозможен; 3. программа «Аксесс»; 4. производить машинный поиск данных

access address адрес доступа; указатель, ссылка

admin сокр. от administrator, administration, administrating

administering 1. администрирование; 2. администрирующий

administrating 1. управление; 2. управляющий

administration управление

administrative административный, управляющий

administrator администратор

application development interface интерфейс разаработки приложений

application domain прикладная область, предметная область

application environment specification спецификация среды прикладных программ

arithmetic operation арифметическая операция

arithmetic operator арифметический оператор; знак арифметической операции

arithmetic shift арифметический сдвиг

arithmetic unut (AU) арифметическое устройство (АУ)

arithmetical арифметический

arithmetical cycle арифметический цикл

-B-

basis базис, основа

batch 1. пакет (обрабатываемых данных); 2. пакетный; batch mode пакетный режим; 3. командный (файл)

batch entry пакетный ввод (данных)

batch file пакетный (командный) файл; batch file missing пропущено имя пакетного файла

batch job пакетное задание

batch loading пакетная загрузка

batch mode пакетный режим

batch operation обработка в пакетном режиме

bus receiver приемник шины

bus request запрос шины

bus watcher контролер шины

business 1. дело, бизнес; 2. деловой; коммерческий

business data processing обработка деловой информации

business PC персональный компьютер для малого бизнеса

Business Rules Language (BRL) Язык деловых правил

-C-

cable interface кабельное сопряжение

cable layout кабель-план, схема расположения кабелей

cache 1. кэш, высокоскоростная память, сверхоперативная память; 2. помещать в кэш

cache buffer кэш-буфер

CD 1. (change directory) изменить директорию; 2. (carrier detect) несущий сигнал распознан; (collision detected) зафиксировано столкновение; 5. compact disk компакт-диск

CD-A (compact disk audio) компакт-диск аудио

CDC (character deletion character) символ вычеркивания символа

CD-DA (compact disk digital audio) компакт-диск цифрового аудио

CD drive (compact disk drive) привод CD-ROM

CD-DVI (compact disk-digital video interactive) интерактивный компакт-диск с цифровой записью видеосигнала

central module центральный модуль

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

-D-

disk drive дисковод; disk drive (is) not ready дисковод не готов

dispersion рассеивание, рассредоточение
displace перемещать
displaced перемещенный
displacement перемещение, перестановка; смещение
display 1. дисплей, экран дисплея, монитор; **black-and-white display** дисплей с черно-белым изображением; **colour display** дисплей с цветным изображением; **computer display** дисплей компьютера; 2. индикация, отображение *(информации)*; 3. показ, демонстрация; 4. выделение особым шрифтом; 5. показывать, демонстрировать; 6. выделять особым шрифтом; 7. воспроизводить на экране дисплея; вывести *(на экран)*; 8. показывать; **display labels** показать заголовки; **display found text** показать найденный текст; **display ruler** показать линейку *(напр., масштабную)*
display adapter адаптер дисплея, видеоадаптер, видеокарта
display capacity емкость дисплея

display control interface интерфейс управления дисплеем

-E-

expanse пространство

expansion расширение; дополнение

expansion bus шина расширения

expansion slot слот (разъем) расширения; дополнительная позиция

-F-

file search поиск файла

file search system система поиска файлов

file section секция файла

file security защита файла

file seperator character символ разделения файлов

file server файловый сервер, файл-сервер *(сети)*

file server name имя файлового сервера

file set файловое множество

file sharing разделение файлов; совместное использование файлов

file size размер файла

file specification, filespec спецификация файла

full screen 1. изображение на весь экран; 2. Полноэкранный

-G-

GIF (graphic interchange format) формат графического обмена, формат обмена графическими данными

GIFT (general Internet file transfer) общий файловый обмен в *Internet*

gigabit (GB) гигабит, гбит

gigabyte (GB) гигабайт, гбайт

gigaFLOPS гигафлопс, гфлопс

gigaherz гигагерц

-H-

hardware block аппаратный блок

hardware compatibility аппаратная совместимость

hardware-compatible аппаратно-соместимый

hardware compatible list (HCL) список совместимого оборудования

hardware configuration конфигурация компьютера

hardwared аппаратный

hardware division аппаратное деление

hardware engineer электронщик, специалист по компьютерам

hardware environment аппаратная среда

hardware error ошибка в аппаратуре

hardware failure аппаратный сбой

-I-

input 1. ввод, загрузка; 2. устройство ввода; 3. входной; 4. исходный (о данных); 5. вводить данные (в машину)

instruct обучать; инструктировать

instruction 1. команда, инструкция, программа; 2. техническое руководство

instruction address адрес команды

instruction address register регистр адреса команды

instruction card программная карта

interface 1. устройство сопряжения; связующее звено, интерфейс; **the man-machine interface** диалоговый режим работы; **natural language interface** естественно-языковой интерфейс; 2. соединять, связывать с компьютером; 3. служить средством связи

interface adapter интерфейсный адаптер

-J-

job batch пакет заданий

job class класс задания *(код, указывающий параметры обслуживания задания системой управления заданиями)*

job control управление заданиями

job control language 1. язык управления заданиями. 2. **(JCL)** *название языка управления заданиями в операционных системах ЭВМ IBM*

job control statement предложение языка управления заданиями

-K-

key system дескрипторная система

keyboard 1. клавиатура; 2. вводить информацию с клавиатуры, набирать на клавиатуре

keyboard accelerator командная клавиша

keyboard common contact общий контакт клавиатуры

keyboard computer клавишная вычислительная машина

-L-

LAN (Local Area Network) локальная сеть (ЛС), локальная вычислительная сеть (ЛВС)

landing площадка

landing zone зона парковки *(головки дисковода)*

landmark ориентир

LAN Driver драйвер локальной сети *(LAN)*

LCD 1. **(liquid crystal display)** дисплей на жидких кристаллах, жидкокристаллический дисплей; 2. **(lowest common denominator)** наименьший общий знаменатель

LCF (least common factor) наименьшее общее кратное

liquid crystal жидкий кристалл

liquid-crystal жидкокристаллический

liquid-crystal display (LCD-display) дисплей на жидких кристаллах, жидкокристаллический дисплей

-M-

mobile computer мобильный компьютер

mobile station передвижная станция

mobile module мобильный модуль

mobile unit мобильное устройство

mobility подвижность

moby полное адресное пространство

mock-up оригинал-макет

modal модальный

modal dialog модальная панель диалога, модальное диалоговое окно, модальное окно

modal window модальное окно

mode 1. вид, форма; режим (работы); 2. метод, способ

monitor 1. монитор, видеоконтрольное устройство; 2. контролировать, проверять; monitor port проверить порт

monitoring слежение, контроль, мониторинг, текущий контроль

-O-

optical disk driver накопитель на оптических дисках

output 1. Вывод; результат; 2. Вывод данных; 3. Выходной; 4. Окончательный (о данных); 5. Выводить (данные)

overhead 1. верхний слой; 2. верхний; 3. дополнительный; 4. наверху

overhead bus дополнительная служебная шина

overlap 1. совмещение; 2. (частично) перекрывать; частично совпадать

overlay 1. перекрытие, оверлей; 2. перезагрузка; 3. наложение; 4. перекрывать, накладывать

-P-

panel 1. панель; panel on панель открыта; panel off панель закрыта; 2. список, перечень

pane scrolling плавная прокрутка

password authentification 1. проверка пароля; 2. аутентификация (опознавание) пользователя по паролю

password caching кэширование паролей

password protection защита паролем, допуск по паролю

-R-

random access memory (RAM) оперативное запоминающее устройство (ОЗУ)

random-access storage (RAS) запоминающее устройство с произвольным доступом

random action случайное воздействие

reproduction 1. воспроизведение; 2. копия; 3. копирование

reproductive воспроизводительный

reprogram перепрограмировать

reprogrammable перепрограммируемый

reprogrammable read-only memory перепрограммируемое постоянное запоминающее устройство

ROM (read only memory) постоянное запоминающее устройство (ПЗУ)

ROM BIOS (read-only memory basic input/output system) базовая система ввод-вывода, хранящаяся в постоянной памяти

room пространство

romantize передавать латиницей (буквы кириллицы, иероглифы и т.д.)

romantized переданный латиницей

romantized script передача кириллических букв латиницей

root 1. корень; 2. главный пользователь (суперпользователь) операционной системы UNIX; 3. Корневой

-S-

secretary курсив, напоминающий рукописный шрифт

secretary hand курсив, напоминающий рукописный шрифт

secretary type курсив, напоминающий рукописный шрифт

set up устанавливать, организовывать

set-up control unit блок управления установкой

sign on предъявлять пароль при входе в диалоговую систему

signal 1. сигнал; 2. сигнальный; 3. сигналить, сигнализировать

-T-

tape control unit блок управления лентой

tape operating system ленточная операционная система

tape-record записывать на пленку

tape-recorder магнитофон

tape recording 1. запись на (магнитофонную) пленку; 2. магнитофонная пленка с записью

tight плотный

tight line слившиеся строки

tilde (character) тильда, знак «~»

tile 1. мозаика; элемент мозаичного изображения; 2. часть; фрагмент

tiled мозаичный

tiles разбивка

tiling управление окнами

till (вплоть) до; до *(какого-либо времени)*

time 1. время; **machine time** машинное время; **time of computing** время вычислений; **sell (machine) time** продавать машинное время; 2. такт; раз; 3. временной

toner тонер, порошок; **toner low** недостаточно тонера (порошка)

toner saver режим экономии тонера (порошка)

too 1. тоже; 2. слишком; **too many files open** открыто слишком много файлов

tool 1. инструмент; **tools** а) инструментальные программные средства; б) вспомогательные программы; **tools and utilities guide** руководство пользователя по утилитам; 2. инструментальный

tool command language инструментальный командный язык

-U-

unique name уникальное имя; уникальный ключ

unique word однозначное (специальное) слово

unit 1. единица; целое; **unit of measure** единица измерения; 2. модуль *(программа)*; 3. процессор; **central processing unit** центральный процессор; 4. блок; устройство, техническое устройство; **power supply unit (PSU)** блок питания; 5. единица измерения; 6. элемент; **unit of work** элемент работы; 7. набор; 8. единичный

unit address адрес устройства

upgraded модернизированный, усовершенствованный, улучшенный

upgrading усовершенствование, обновление

upload 1. пересылка файла из рабочей станции в хост-компьютер; пересылка файла из клиентского компьютера в другой; 2. переслать; 3. выгрузить

uploaded выгруженный

uploading выгрузка *(также – по линии связи)*

upper верхний, высший; **upper half of plane** верхняя полуплоскость

upper acceptance limit (UAL) верхний допустимый предел

upper case, uppercase 1. прописные (заглавные) буквы; 2. режим набора в верхнем регистре, заглавными буквами; 3. писать прописными (заглавными) буквами

-V-

virtual world виртуальный мир

virtually виртуально

virus вирус

visiting посещение

visitor посетитель

visual зрительный; графический

Visual Basic Визуальный Бейсик *(язык программирования - разновидность языка Basic)*

Visual Basic for applications *Visual Basic* для приложений

visual data input unit (VDIU) устройство ввода видеоинформации

visual display unit (VDU) устройство визуального отображения, дисплей, монитор

visualize визуализировать; представлять

visualized визуализированный; представленный

visual menu визуальное меню

visual page отображаемая страница

visual programming language визуальный язык программирования

visuals визуальные средства

vital очень важный, абсолютно необходимый; **vital of importance** первостепенной важности

-W-

white space 1. пробел; 2. пустое место на отпечатанном листе

white space character разделитель в тексте

windowing system система управления окнами

Windows название операционной системы компании Microsoft

windows application оконное применение (обращение)

Windows logon обычный вход в Windows

wireframe каркас *(каркасный режим просмотра)*

wireless беспроводный

wireless LAN беспроводная локальная сеть

wireless office system (WOS) беспроводная офисная сетевая система

wiring diagram монтажная схема

WISK (wide instruction set computing) ВИСК (вычислительная система с широким набором команд)

with (совместно) с

without без

word processing center (WPC) центр обработки текстовых данных

word processing simulation эмуляция текстового процессора

word processing system система обработки текстов

word processor текстовый процессор, устройство для электронной обработки, электронный редактор

word recognition распознавание слов

word recognition system система распознавания слов

-X-

X, x 1. координата X; 2. икс, неизвестная величина; 3. **(ex)** экс-; бывший; 3. **(exchange)** обмен; 4. зачеркнуть; аннулировать, отменить

X-d (X-dimention) в направлении оси X

x out зачеркнуть; аннулировать, отменить

X-reference перекрестная ссылка

X-shaped крестообразный *(о пересечении контурных линий на изображении)*

X-Y plotter (двух)координатный графопостроитель, построитель кривых в декартовых координтах

X-Y table координатный графопостроитель

XA (extended architecture) расширенная архитектура

xerocopy ксерокопия

xerograph ксерограф, ксерографический аппарат

xerographic printer ксерографическое печатающее устройство

xerography ксерографирование

-Y-

Y, y 1. координата Y; 2. игрек, неизвестная величина

Y-adapter кабель, подобный по форме букве «Y» *(позволяет подключать два устройства к одному порту)*

Y-d (y-dimention) в направлении оси Y

Y-shaped вилкообразный *(о пересечении контурных линий на изображении)*

YACC, yacc (yet another compiler-compiler) компилятор компиляторов *(входит в стандарный набор программных средств операционной системы UNIX)*

yank копировать текст в буфере

yes да

yes-no decision выбор типа «да-нет»

yield 1. выпуск; производственный выход; выход годных изделий; 2. объем выпуска *(продукции)*; 3. результат; 4. вырабатывать *(значение)*; 5. давать,

выдавать *(импульс, значение)*; **yield a flavor** придавать давать красоту *(системе или программе)*; 6. возвращать *(значение)*

-Z-

ZIP 1. стандарт сжатия файлов и формат архивов; 2. (zig-zag in-line pin) корпус чипа с двумя рядами контактов в виде зигзага

zip code почтовый индекс

zip file архивный файл

zip мгновенно перемещать; перебрасывать (напр., курсор из одной точки экрана в другую)

Z-lid Z-образная крышка *(стекла экспонирования – в сканерах)*

zap 1. *команда полного стирания рабочей области*; 2. (физическое) уничтожение файла на диске; 3. очистка экрана; 4. затирать, удалять; **zap a row** стереть строку

zapping разрушение перемычек в микросхеме

zapt dingbat font пиктографический шрифт

ZC (zone coordinator) координатор зоны

ZCD (zero crossing detector) детектор пересечения нуля

ZDIV (zero divide) деление на нуль

ZDR (zoned data recording) зонированная запись данных

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