ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ СТАВРОПОЛЬСКИЙ ГОСУДАРСТВЕННЫЙ АГРАРНЫЙ УНИВЕРСИТЕТ

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УЧЕБНОЕ ПОСОБИЕ

ENGLISH FOR COMPUTING

АНГЛИЙСКИЙ ЯЗЫК ДЛЯ IT-СПЕЦИАЛЬНОСТЕЙ

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Содержит учебные тексты, упражнения на отработку лексического и повторение грамматического материала, а также тексты для дополнительного чтения. Основным назначением пособия является развитие у обучающихся навыков чтения и говорения на английском языке с использованием IT-терминологии.

Предназначено для студентов вузов, обучающихся по IT-специальностям, а также для желающих самостоятельно изучить технический английский язык.

Contents

UNIT 1
COMPUTER APPLICATIONS AND CONFIGURATION

TEXT 1
Read and translate the text below.

WHAT CAN COMPUTERS DO?
I

Computers can help students perform mathematical operations and solve difficult questions. They can be used to teach courses such as computer-aided design, language learning, programming, mathematics, etc.

PCs (personal computers) are also used for administrative purposes: for example, schools use databases and word processors to keep records of students, teachers and materials.

Race organizers and journalists rely on computers to provide them with the current positions of riders and teams in both the particular stages of the race and in the overall competition.

Workstations in the race buses provide the timing system and give up-to-the-minute timing information to TV stations. In the press room several PCs give real-time information on the state of the race. Computer databases are also used in the drug detecting tests for competitors.

Computers store information about the amount of money held by each client and enable staff to access large databases and to carry out financial transactions at high speed. They also control the automatic cash dispensers which, by the use of a personal coded card, dispense money to clients.

Airline pilots use computers to help them control the plane. For example, monitors display data about fuel consumption and weather conditions.

In airport control towers, computers are used to manage radar systems and regulate air traffic.

On the ground, airlines are connected to travel agencies by computer. Travel agents use computers to find out about the availability of flights, prices, times, stopovers and many other details.

II

Computers and microchips have become part of our everyday lives: we visit shops and offices which have been designed with the help of computers, we read magazines which have been produced on computer, we pay bills prepared by computers. Just picking up a telephone and dialing a number involves the use of a sophisticated computer systems, as does making a flight reservation or bank transaction.

We encounter daily many computers that spring to life the instant they're switched on (e.g. calculators, the car's electronic ignition, the timer in the microwave, or the programmer inside the TV set), all of which use chip technology.

What makes your computer such a miraculous device? Each time you turn it on, it is a tabula rasa that, with appropriate hardware and software, is capable of doing anything you ask. It is a calculating machine that speeds up financial calculations. It is an electronic filing cabinet which manages large collections of data such as customers' lists, accounts, or inventories. It is a magical typewriter that allows you to type and print any kind of document – letters, memos or legal documents. It is a personal communicator that enables you to interact with other computers and with people around the world. If you like gadgets and electronic entertainment, you can even use your PC to relax with computer games.

Text exercises

1. Find the words in part 1 of the text and match them with the meanings below.
a) information
b) execute (do)
c) connected with money
d) keep (save)
e) massive
f) linked
g) self-acting, mechanical
h) screen
i) powerful computer usually connected to a network
j) program used for text manipulation

2. Answer the questions on text 1.
a) What helps airline pilots control fuel consumption and weather conditions?
b) How can computers be used in teaching process?
c) Why do travel agents need computers?
d) How are computers connected with the banking area?
e) Why do race organizers and journalists depend heavily on computers?
f) Do you know any examples of using computers in every day life?
g) What makes a computer so multifunctional?

3. Retell the text.

TEXT 2
Read and translate the text below.

WHAT IS A COMPUTER?

Computers are electronic machines which can accept data in a certain form, process the data and give the results of the processing in a specified format as information.

Three basic steps are involved in the process. *First,* data is fed into the computer's memory. *Then,* when the program is run, the computer performs a set of

instructions and processes the data. *Finally,* we can see the results (the output) on the screen or in printed form.

Information in the form of data and programs is known as **software**, and the electronic and mechanical parts that make up a computer system are called **hardware**. A standard computer system consists of three main sections: the central processing unit (CPU), the main memory and the peripherals.

Perhaps the most influential component is the **central processing unit**. Its function is to execute program instructions and coordinate the activities of all the other units. In a way, it is the "brain" of the computer. The **main memory** holds the instructions and data which are currently being processed by the CPU. The **peripherals** are the physical units attached to the computer. They include storage devices and input/output devices.

Storage devices (floppy, hard or optical disks) provide a permanent storage of both data and programs. **Disk drives** are used to handle one or more floppy disks. **Input devices** enable data to go into the computer's memory. The most common input devices are the **mouse** and the **keyboard**. **Output devices** enable us to extract the finished product from the system. For example, the computer shows the output on the **monitor** or prints the results onto paper by means of a **printer**.

On the rear panel of the computer there are several ports into which we can plug a wide range of peripherals – modems, fax machines, optical drives and scanners.

These are the main physical units of a computer system, generally known as the **configuration**.

Text exercises

1. Use the information in the text to help you match the terms in the box with the appropriate explanation or definition below.

> *a) software; b) peripheral devices; c) monitor; d) floppy disk; e) hardware;*
> *f) input; g) port; h) output; i) central processing unit.*

1) The brain of the computer.
2) Physical parts that make up a computer system.
3) Programs which can be used on a particular computer system.
4) The information which is presented to the computer.
5) Results produced by a computer.
6) Hardware equipment attached to the CPU.
7) Visual display unit.
8) Small device used to store information.
9) Any socket or channel in a computer system into which an input/output device may be connected.

2. Read these slogans or quotations, and say what computer element they refer to.

1) a. "Point and click here for power."
   b. "Obeys every impulse as if it were an extension of your hand."
2) a. "Displays your ideas with perfect brilliance."
   b. "See the difference – sharp images and a fantastic range of colours."
3) a. "I love this drive. It's quiet and fast."
   b. "With this it's easy to back up your data before it's too late."
4) a. "Power and speed on the inside."
   b) "Let your computer's brain do the work."
5) a. "…a big impact on the production of text and graphics."
   b. "Your choice: a laser powerhouse."

3. Retell the text.

TEXT 3

Read and translate the text.

ASSISTIVE ELECTRONIC DEVICES AND SOFTWARE
What is Assistive or Adaptive Computer Technology?

Assistive Computer Technology is any piece of equipment that is customized to make life easier for a person who has a disability.

Computer Software Accessibility:

In human-computer interaction, computer accessibility (also known as accessible computing) refers to the accessibility of a computer system to all people, regardless of disability or severity of impairment, examples include web accessibility guidelines.

Challenges

Many people with disabilities face a variety of challenges in terms of providing computer input, interpreting output and reading documentation. For persons with disabilities, the keyboard, mouse, and monitor are of prime concern so adaptive hardware and software have been developed to provide alternatives. The personal computer (PC) can be the backbone of independence for millions of individuals with sensory, physical, and learning disabilities.

Screen reader programs such as *JAWS* or *HAL* are designed to allow even totally blind people to use the computer. They convert the text and icons to speech so one can use a computer without needing to see the monitor.

Accessible computer equipment and PC access aids can make it easier for computer users to use word processing programs, surf the Internet, and send email, but they can also help non-computer users handle many non-computer tasks.

Any system that aids individuals who are not independent verbal communicators is known as an augmentative communication system. The system can include speech, gestures, sign language, symbols, synthesized speech, dedicated communication aids or microcomputers.

Examples of Assistive Computer Technology Include:
- Optical character recognition (OCR) software systems are used to scan printed materials directly into the PC to accommodate many types of disabilities.
- Screen readers are software programs that provide either speech or Braille output, and are commonly employed by persons who are blind or visually impaired.
- Non-assistive computer programs like electronic mail and instant messaging empower individuals with hearing-related impairments to communicate over the Internet.
- Magnification software enlarges text and graphics displayed on PC monitors. Magnification programs are widely used by persons with poor vision or who have difficulty reading.

Common Keyboard Input Modifications Include:
- Adapted keyboards,
- On-screen keyboards,
- Alternative communication programs,
- Voice recognition.
- *Typing shortcuts or Hot Keys*

Voice recognition and dictation systems are powerful assistive technologies that allow persons with disabilities to control a computer and dictate documents verbally using spoken commands.

Most computer vendors support persons with disabilities by incorporating accessibility utilities into operating systems such as Microsoft Windows, Apple Macintosh, and UNIX. PCs equipped with assistive technology permit individuals to function independently at school, work, and home, and allow access to great quantities of information from diverse sources such as compact disks, networks, electronic mail, instant messaging, the World Wide Web, and other Internet resources.

Facts Regarding Assistive Technology Electronic Devices

Assistive technology may attempt to improve the ergonomics of the devices themselves such as Dvorak and other alternative keyboard layouts, which offer more ergonomic layouts of the keys. Assistive technology devices have been created to enable people with disabilities to use modern touch screen mobile computers such as the iPad, iPhone and iPod touch. The Pererro is a plug and play adapter for iOS devices which uses the built in *Apple VoiceOver feature* in combination with a basic switch. This brings touch screen technology to those who were previously unable to use it.

Alternative input devices allow individuals to control their computers through means other than a standard keyboard or pointing device. Examples include:
- Sip-and-puff systems - activated by inhaling or exhaling.
- Joysticks - manipulated by hand, feet, chin, etc. and used to control the cursor on screen.
- Trackballs - movable balls on top of a base that can be used to move the cursor on screen.

- Wands and sticks - worn on the head, held in the mouth or strapped to the chin and used to press keys on the keyboard
- Alternative keyboards - featuring larger- or smaller-than-standard keys or keyboards, alternative key configurations, and keyboards for use with one hand.
- Electronic pointing devices - used to control the cursor on the screen without use of hands. Devices used include ultrasound, infrared beams, eye movements, nerve signals, or brain waves.
- Touch screens - allow direct selection or activation of the computer by touching the screen, making it easier to select an option directly rather than through a mouse movement or keyboard. Touch screens are either built into the computer monitor or can be added onto a computer monitor.

GRAMMAR
Tense Revision: Present Tenses

Ex. 1. Раскройте скобки, употребляя глаголы в *Present Continuous* или в *Present Simple*.

1. I (not to drink) coffee now. I (to write) an English exercise. 2. I (not to drink) coffee in the evening. I (to drink) coffee in the morning. 3. Your friend (to do) his homework now? 4. Your friend (to go) to school in the morning? 5. Look! The baby (to sleep). 6. The baby always (to sleep) after dinner. 7. My grandmother (not to work). She is on pension. 8. My father (not to sleep) now. He (to work) in the garden. 9. I usually (to get) up at seven o'clock in the morning. 10. What your sister (to do) now? – She (to wash) her face and hands. 11. When you usually (to come) home from school? – I (to come) at three o'clock. 12. Where your cousin (to work)? – He (to work) at a hospital. 13. Your sister (to study) at an institute? – No, she (to study) at school. 14. My cousin (to go) to school every day. 15. My mother (not to play) the piano now. She (to play) the piano in the morning.

Ex. 2. Раскройте скобки, употребляя глаголы в *Present Continuous* или в *Present Simple*.

1. I (to read) books in the evening. 2. I (not to read) books in the morning. 3. I (to write) an exercise now. 4. I (not to write) a letter now. 5. They (to play) in the yard now. 6. They (not to play) in the street now. 7. They (to play) in the room now? 8. He (to help) his mother every day. 9. He (to help) his mother every day? 10. He (not to help) his mother every day. 11. You (to go) to school on Sunday? 12. My friend (not to like) to play football. 13. I (not to read) now. 14. He (to sleep) now? 15. We (not to go) to the country in winter. 16. My sister (to eat) sweets every day. 17. She (not to eat) sweets now. 18. They (to do) their homework in the afternoon. 19. They (not to go) for a walk in the evening. 20. My father (not to work) on Sunday. 21. He (to work) every day.

Ex. 3. Раскройте скобки, употребляя глаголы в *Present Continuous* или в *Present Simple*.

1. I (to write) a composition now. 2. I (not to drink) milk now. 3. I (to go) for a walk after dinner. 4. I (not to go) to the theatre every Sunday. 5. He (not to read) now. 6. He (to play) now. 7 He (to play) now? 8. My mother (to work) at a factory. 9. My aunt {not to work) at a shop. 10. You (to work) at an office? 11. My friend (to live) in St. Petersburg. 12. My cousin (not to live) in Moscow. 13. The children (not to sleep) now. 14. The children (to play) in the yard every day. 15. They (not to go) to the stadium on Monday. 16. She (to read) in the evening. 17. She (not to read) in the morning. 18. She (not to read) now. 19. Your father (to work) at this factory? 20. You (to play) chess now? 21. Look at the sky: the clouds (to move) slowly, the sun (to appear) from behind the clouds, it (to get) warmer. 22. How is your brother? – He is not well yet, but his health (to improve) day after day. 23. Listen! Who (to play) the piano in the next room?

Ex. 4. Переведите на английский язык, употребляя глаголы в *Present Continuous* или в *Present Perfect Continuous*.
1. а) Они все еще спорят. б) Они спорят уже два часа. 2. а) Она еще спит. б) Она спит уже два часа. 3. а) Он еще делает уроки. б) Он делает уроки уже три часа. 4. а) Мальчики все еще играют в футбол. б) Они играют в футбол уже сорок минут. 5. а) Девочки еще переодеваются. б) Они переодеваются уже полчаса. 6. а) Она все еще изучает испанский язык. б) Она уже два года изучает испанский язык. 7. а) Они все еще живут на даче. б) Они уже четыре месяца живут на даче. 8. а) Она все еще разговаривает по телефону. б) Она разговаривает по телефону уже двадцать минут. 9. а) Мой брат все еще решает эту трудную задачу. б) Он решает эту задачу уже полчаса. 10. а) Она все еще пишет письмо бабушке. б) Она уже целый час пишет это письмо. И. а) Они все еще ловят рыбу. б) Они ловят рыбу уже пять часов. 12. а) Дедушка и бабушка все еще играют в лото. б) Они играют в лото уже два часа. 13. а) Артисты все еще репетируют эту сцену. б) Они репетируют эту сцену уже три часа. 14. а) Дети все еще бегают во дворе. б) Они уже три часа бегают во дворе. 15. а) Он все еще пишет свою новую книгу. б) Он пишет свою новую книгу уже два года. 16. а) Он все еще учит монолог Гамлета. б) Он учит монолог Гамлета уже два дня. 17. а) Мы все еще ремонтируем нашу квартиру. б) Мы ремонтируем нашу квартиру уже полмесяца.

Ex. 5. Раскройте скобки, употребляя глаголы в одном из следующих времен: *Present Simple, Present Continuous, Present Perfect, Present Perfect Continuous.*
1. He (to run) now. He (to rim) for ten minutes without any rest. 2. What they (to do) now? – They (to work) in the reading-room. They (to work) there for already three hours. 3. Where he (to be) now? – He (to be) in the garden. He (to play) volleyball with his friends. They (to play) since breakfast time. 4. I (to live) in St. Petersburg. I (to live) in St. Petersburg since 1990. 5. She already (to do) her homework for two hours; but she (not yet to do) half of it. 6. I (to wait) for you since two o'clock. 7. What you (to do)? – I (to read). I (to read) for already two hours. I already (to read) sixty pages. 8. This man (to be) a writer. He (to write) books. He (to write) books

since he was a young man. He already (to write) eight books. 9. What you (to do) here since morning? 10. Lena is a very good girl. She always (to help) her mother about the house. Today she (to help) her mother since morning. They already (to wash) the floor and (to dust) the furniture. Now they (to cook) dinner together. 11. This is the factory where my father (to work). He (to work) here for fifteen years. 12. You (to find) your notebook? – No! I still (to look) for it. I already (to look) for it for two hours, but (not yet to find) it. 13. You (to play) with a ball for already three hours. Go home and do your homework. 14. Wake up! You (to sleep) for ten hours already. 15. I (to wait) for a letter from my cousin for a month already, but (not yet to receive) it. 15. It is difficult for me to speak about this opera as I (not to hear) it. 16. I just (to receive) a letter from my granny, but I (not yet to receive) any letters from my parents. 17. The weather (to be) fine today. The sun (to shine) ever since we got up. 18. Every day I (to wind) up my watch at 10 o'clock in the evening. 19. Come along, Henry, what you (to do) now? I (to wait) for you a long time. 20. Where your gloves (to be)? – I (to put) them into my pocket.

UNIT II
INSIDE THE SYSTEM

TEXT 1
Read and translate the text below.

WHAT'S INSIDE A COMPUTER?

The nerve centre of a computer is the central processing unit or CPU. This is a unit which executes program instructions and supervises the computer's overall operation. The unit consists of three main parts:

I. the **control unit,** which examines the instructions in the user's program, interprets each instruction and causes the circuits and the rest of the components – disk drives, monitor, etc. – to be activated to execute the functions specified;

II. the **arithmetic logic unit** (ALU), which performs mathematical calculations (+, -, etc.) and logical operations (and, or, etc.);

III. the **registers**, which are high-speed units of memory used to store and control information. One of these registers is the program counter (PC) which keeps track of the next instruction to be performed in the main memory. Another is the instruction register (IR) which holds the instruction that is currently being executed.

In microcomputers CPU is built into a single microprocessor chip – an integrated circuit. Microprocessors differ in the amount of data – the number of bits – they can work with at a time. There are 8, 16, 32 and 64-bit processors. The computer's internal architecture is evolving so quickly that the new 64-bit processors are able to address 4 billion times more information than a 32-bit system.

The programs and data which pass through the central processor must be loaded into the **main memory** (also called the **internal memory**) in order to be processed. Thus, when the user runs an application, the microprocessor looks for it on secondary storage devices (disks) and transfers a copy of the application into the RAM area. RAM (random access memory), i.e. its information is lost when the computer is turned off. However, the ROM section (read only memory) is permanent and contains instructions needed by the processor.

Most of today's computers have internal **expansion slots** that allow users to install adapters or expansion boards. Popular adapters include high-resolution graphics boards, memory expansion boards, and internal modems.

The power and performance of a computer is partly determined by the speed of its microprocessor. A **clock** provides pulses at fixed intervals to measure and synchronize circuits and units. The clock speed is measured in MHz (megahertz) and refers to the frequency at which pulses are emitted. For example, a CPU running at 500 MHz (500 million cycles per second) is likely to provide a very fast processing rate and will enable the computer to handle the most demanding applications.

Text exercises

1. Decide if the sentences are true (T) or false (F), and rewrite the false ones to make them true.

1) The CPU directs and coordinates the activities taking place within the computer system.

2) The arithmetic logic unit performs calculations on the data.

3) 32-bit processors can handle more information than 64-bit processors.

4) A chip is an electronic device composed of silicon elements containing a set of integrated circuits.

5) RAM, ROM and secondary storage are the components of the main memory.

6) Information cannot be processed by the microprocessor if it is not loaded into the main memory.

7) "Permanent" storage of information is provided by RAM (random access memory).

8) The speed of the microprocessor is measured in megahertz. One MHz is equivalent to one million cycles per second.

2. What do the words in bold print refer?

1) … **which** executes program instructions and supervises … (paragraph 1).

2) … the instruction **that** is currently being executed. (paragraph 4)

3) … the amount of data – the number of bits – **they** can work with at a time. (paragraph 5)

4) … the microprocessor looks for **it** on … (paragraph 6)

5) … **its** information is lost when the computer is turned off. (paragraph 6)

6) … expansion slots **that** allow users to install adapters or expansion boards. (paragraph 7)

3. Retell the text.

TEXT 2

Read the text and complete it with the phrases in the box. Then translate the text.

1) All the information stored in the RAM is temporary
2) Microcomputers make use of two types of main memory
3) ROM chips have "constant" information
4) the size of RAM is very important

MAIN MEMORY: RAM AND ROM

The main memory of a computer is also called the "immediate access store", as distinct from any storage memory available on disks. (1)……………………………………………………: RAM and ROM, both contained in electronic chips connected to the main board of the computer.

RAM stands for "random access memory" and is the working area of the computer, that is, the basic location where the microprocessor stores the required information. It is called "random access" because the processor can find information in any cell or memory address with equal speed, instead of looking for the data in sequential order.

(2) ……………………………………………., so it is lost when the machine is turned off. Therefore, if we want to use this information later on, we have to save it and store it on a disk. When running an application, the microprocessor finds its location in the storage device (the floppy or hard disk) and transfers a temporary copy of the application to the RAM area. Consequently, (3) ………………………………………………… if we want to increase the performance of a computer when several applications are open at the same time or when a document is very complex.

The RAM capacity can sometimes be expanded by adding extra chips. These are usually contained in single in-line memory modules or SIMMs, which are installed in the motherboard of the computer.

We can designate a certain amount of RAM space as a **cache** in order to store information that an application uses repeatedly. A RAM cache may speed up our work, but it means that we need enough internal memory or a special cache card.

ROM is an acronym for "read only memory", which implies that the processor can read and use the information stored in the ROM chip, but cannot put information into it. (4) …………………………………………………, including instructions and routines for the basic operations of the CPU. These instructions are used to start up the computer, to read the information from the keyboard, to send characters to the screen, etc. They cannot be changed and are not erased when the power is turned off. For this reason, the ROM section is also referred to as **firmware**.

Text exercises

1. As we have seen, there are three types of memory used by the computers: RAM, ROM and secondary storage. Look through this list of features and decide which type of memory they refer to.

1) Any section of the main memory can be read with equal speed and ease.
2) It is available in magnetic, optical and video disks.
3) A certain amount of this memory can be designated as "cache" memory to store information in applications that are used very frequently.
4) It stores basic operating instructions, needed by the CPU to function correctly.
5) Memory which can be expanded by adding SIMMs of 8 MB, 16 MB, 32 MB or other major increments.
6) Information is permanent and cannot be deleted.
7) You can save and store your documents and applications.

2. Answer the questions on texts 1 and 2.

a) What are the main parts of the CPU?
b) What is RAM?

c) What memory section is also known as "firmware"?
d) What information is lost when the computer is switched off?
e) What is the typical unit used to measure RAM memory and storage memory?
f) What is the meaning of the acronym SIMM?
g) What is a megahertz?
h) What is the ALU? What does it do?
i) What is the abbreviation for "binary digit"?
j) How can we store data and programs permanently?

3. Retell the text.
TEXT 3

PROCESSOR SPEED AND ARCHITECTURE

The speed of a computer's processor chip (technically known as its "clock speed") is measured in gigahertz (GHz), with the fastest modern processors currently running at up to 4.7GHz. However, for most computing tasks – including web browsing, sending e-mails, word processing and spreadsheet work – any processor running at 1GHz or more remains perfectly sufficient.

Where higher processor speeds become more important is for applications such as video editing, 3D graphics work and (for the majority of "power users") playing computer games! For any of these applications, within reason the faster the processor the better. This said, people in need a very powerful computer have to be aware that CPU performance is now determined by far more than raw speed alone. ***Intel*** made this very clear when it introduced its system of ***processor numbers***. These provide an indication of a processor's "architecture", "cache" and "front side bus (FSB) speed" in addition to its clock speed.

Alongside clock speed, the architecture of a processor is the most important factor to determine its performance, and refers to its basic design and complexity. Some processors are simply more sophisticated than others, with Intel (for example) producing "basic" processors called Celerons and Pentiums, as well as more powerful processors under its "Core" processor family. The later include the Core 2, Core i3, Core i5 and Core i7, with the last of these being the most powerful.

All Intel Core processors feature more than one "core" – or in other words more than one physical processor -- manufactured as a single component. Intel's "Core 2 Duo" chips, for example, feature two processors core on a single chip, whilst "Core 2 Quad" processors have four processor cores. In most situations multi-core processors are far more powerful than traditional single core processors. Quite literally this is because they can do several things at the same time (something single core processors can only achieve by constantly switching back and fourth between doing one thing and doing another). In turn this means that multi-core processors can run at lower speeds than single-core processors and yet be far more powerful. A 2.4GHz Core 2 processor, for example, usually proves far more productive than a single core 3GHz Pentium processor. All of this hopefully makes it clear why clock speed by itself is no longer a straight-forward indicator of processor power, with the

architecture of the processor – and most notably including its number of cores – now being at least as significant.

Intel Celeron, Pentium and Core processors are today all to be found at the heart of new desktop and laptop PCs. Intel additionally also manufacture very-high-specification chips named Xeons and Itaniums to drive the most powerful business workstations and servers. If this range of choice all sounds a bit confusing then to be honest it is – with Intel itself having resorted to a range of processor section wizards in an effort to explain its processor ranges on its own website.

To add further to Intel's abundance of processor choice and complexity, the company also offers a range of low-power processors called Atoms. These are highly energy efficient, and were primarily first intended to be used in mobile computers including netbooks. However, today the latest dual core Atom processors are increasingly finding their way into highly energy-efficient desktop computers. For many people a computer with the latest 1.66GHz or 1.8GHz dual core Atom processor will be capable of undertaking any computing task they require, and probably at least four times more energy efficiently than a Celeron, Pentium or Intel Core based computer.

In addition to clock speed and architecture, a processor's cache and front side bus (FSB) speed also determine a computer's overall power. In brief, cache is a form of very fast memory integrated into the processor chip, and used to store up instructions (work for the processor) so that it has to slow down as little as possible between tasks. Cache is measured in megabytes (MB), with (for example) low-end Celeron processors having as little as 0.25MB of cache (256KB), and high-end Itaniums having up to 24MB. The simple message is, the more cache the better – though high levels of cache still come at a very significant price.

Front side bus (FSB) speed is a measure of how fast a microprocessor communicates with the computer's main circuit board (or "motherboard") into which it is physically connected. Again, the higher the measure the better for overall performance, with FSB speeds currently ranging from 533MHz (still perfectly sufficient for the vast majority of applications) up to 1600Mhz.

NOTE: Whilst the examples in the above section all refer to Intel microprocessors, it should be noted that the PC processor market is dominated by both Intel (with about 80 per cent market share) and its main rival **AMD**. AMD's low specification processors are called Semprons, its mid-range chips called Athlons, and its high-end chips called Phenoms and A-Series.

GRAMMAR
Tense Revision: Past Tenses

Ex. 1. Раскройте скобки, употребляя глаголы в *Past Simple* или *Past Continuous.*
1. I (to play) computer games yesterday. 2. I (to play) computer games at five o'clock yesterday. ; 3. He (to play) computer games from two till three yesterday. 4. We (to play) computer games the whole evening yesterday. 5. What Nick (to do) when you

came to his place? 6. What you (to do) when I rang you up? 7. I (not to sleep) at nine o'clock yesterday. 8. What he (to do) yesterday? – He (to read) a book. 9. What he (to do) the whole evening yesterday? – He (to read) a book. 10. She (to sleep) when you came home? 11. My brother (not to play) tennis yesterday. He (to play) tennis the day before yesterday. 12. My sister (not to play) the piano at four o'clock yesterday. She (to play) the piano the whole evening. 13. When I came into the kitchen, mother (to cook). 14. She (to cook) the whole day yesterday. 15. We (to wash) the floor in our flat yesterday. 16. We (to wash) the floor in our flat from three till four yesterday. 17. You (to do) your homework yesterday? 18. You (to do) your homework from eight till ten yesterday? 19. Why she (to sleep) at seven o'clock yesterday? 20. He (to sit) at the table the whole evening yesterday.

Ex. 2. Раскройте скобки, употребляя глаголы в *Past Simple* или *Past Continuous.*
1. They (to drink) tea when I (to come) home. 2. He (to walk) along the river when a boat (to pass). 3. The old man (to think) about his plan when he (to fall) asleep. 4. We (to listen) to an interesting lecture yesterday. 5. When I (to enter) the classroom, the teacher (to write) words on the blackboard and the pupils (to copy) them into their exercise-books. 6. They (to get) ready to go out when it (to begin) raining. 7. Yesterday at one o'clock I (to have) lunch at the canteen. 8. When he (to come) in, I (to do) my exercises. 9. What you (to do) at eight o'clock yesterday? 10. At this time yesterday I (to go) home. 11, You (to sleep) when I (to go) out. 12. He (to read) on the sofa when I (to come) in and (to sit) down beside him. 13. I (to walk) along the street with my friend when a tram (to pass). 14. She (to look) out of the window when I (to see) her. 15. We (to answer) the teacher's questions when the headmistress (to enter) the classroom.

Ex. 3. Раскройте скобки, употребляя глаголы в *Past Simple* или *Past Continuous.*
1. I (to feed) my cat with fish yesterday. 2. What you (to do) at four o'clock yesterday? – I (to feed) my cat. 3. What your brother (to do) yesterday? – He (to play) computer games. 4. I (to begin) repairing my camera at six o'clock yesterday. 5. At five o'clock yesterday Helen (to cook) soup. 6. We (to play) badminton from nine till eleven yesterday. 7. Kate (not to go) for a walk yesterday. She (to write) a composition the whole day yesterday. 8. When your father (to come) home yesterday? He (to come) home at seven o'clock. 9. When my father (to come) home yesterday, my mother (to make) supper. 10. We (not to go) on a tramp last summer. 11. What you (to do) when your sister (to come) home yesterday? 12. You (to have) supper at nine o'clock yesterday? 13. He (not to go) to the shop yesterday. 14. Nick (to go) to bed at ten o'clock yesterday. 15. Rick (to sleep) at eleven o'clock yesterday. 16. When we (to play) in the yard yesterday, it suddenly (to start) raining heavily. 17, I (to see) Mike when he (to cross) the street. 18. He (to begin) repairing his bicycle in the morning yesterday. 19. He (to repair) his bicycle the whole day yesterday. 20. He (to finish) repairing1 his bicycle in the evening yesterday,

Ex. 4. Раскройте скобки, употребляя глаголы в *Past Simple* или *Past Perfect.*
1. When I (to come) home, mother already (to cook) dinner. 2. When father (to return) from work, we already (to do) our homework. 3. When the teacher (to enter) the classroom, the pupils already (to open) their books. 4. Kate (to give) me the book which she (to buy) the day before. 5. Nick (to show) the teacher the picture which he (to draw). 6. The boy (to give) the goats the grass which he (to bring) from the field. 7. Mother (to see) that Nick (not to wash) his hands. 8. The teacher (to understand) that Lena (not to do) her homework. 9. I (to know) that my friend (not yet to come). 10. Tom (to return) from the cinema at five o'clock. 11. Tom (to return) from the cinema by five o'clock. 12. I (to finish) my homework at seven o'clock. 13. I (to finish) my homework by seven o'clock. 14. He (to think) that he (to lose) the money. 15. Ann (to tell) me that she (to see) an interesting film. 16. When I (to wake) up yesterday, father already (to go) to work. 17. Nick (to think) that his father (not yet to come) home. 18. Mary (to tell) us that she (to cook) a good dinner. 19. Yesterday I (to find) the book which I (to lose) in summer. 20. When we (to come) to the station, the train already (to leave).

Ex. 5. Раскройте скобки, употребляя глаголы в *Past Simple, Past Continuous* и *Past Perfect.*
I. By eight o'clock yesterday I (to do) my homework and at eight I (to play) the piano. 2. By six o'clock father (to come) home and at six he (to have) dinner. 3. By nine o'clock yesterday grandmother (to wash) the dishes and at nine she (to watch) TV. 4. When I (to meet) Tom, he (to eat) an ice-cream which he (to buy) at the corner of the street. 5. When I (to come) home, my sister (to read) a book which she (to bring) from the library. 6. When mother (to come) home, the children (to eat) the soup which she (to cook) in the morning. 7. When I (to ring) up Mike, he still (to learn) the poem which he (to begin) learning at school. 8. When I (to look) out of the window, the chil¬dren (to play) with a ball which Pete (to bring) from home. 9. By ten o'clock the children (to settle) comfortably on the sofa and at ten they (to watch) a TV film. 10. When father (to come) home, we (to cook) the mushrooms which we (to gather) in the wood. 11. When I (to see) Ann, she (to sort) the flowers which she (to pick) in the field. 12. When I (to come) home yesterday, I (to see) that my little brother (to break) my pen and (to play) with its pieces. 13. When I (to open) the door of the classroom, I (to see) that the teacher already (to come) and the pupils (to write) a dictation.

UNIT III
INPUT/OUTPUT DEVICES

TEXT 1
Read and translate the text below.

INPUT DEVICES

Input devices are the pieces of hardware which allow us to enter information into the computer. The most common are the keyboard and the mouse. We can also interact with a computer by using one of these: a lightpen, a scanner, a trackball, a graphics tablet, a joystick or a voice recognition device.

Typically, a **mouse** is a palm-sized device, slightly smaller than a part of cards. On top of the mouse there are one or more buttons for communicating with computer. A "tail" or wire extends from the mouse to a connection on the back of the computer.

The mouse is designed to slide around on your desktop. As it moves, it moves an image on the screen called a **pointer** or **mouse cursor**. The pointer usually looks like an arrow or I-bar, and it mimics the movements of the mouse on your desktop.

What makes the mouse especially useful is that it is a very quick way to move around on a screen. Move the desktop mouse half an inch and the screen cursor will leap four inches. Making the same movements with the arrow keys takes much longer. The mouse also issues instructions to the computer very quickly. Point to an available option with the cursor, **click** on the mouse, and the option has been chosen.

Mice are so widely used in graphics applications because they can do things that are difficult, if not impossible, to do with keyboard keys. For example, the way you move an image with a mouse is to put the pointer on the object you want to move, press the mouse button and drag the image from one place on the screen to another. When you have the image where you want it, you release the mouse button and the image stays there. Similarly, the mouse is used to **grab** one corner of the image (say a square) and stretch it into another shape (say a rectangle). Both of these actions are so much more difficult to perform with a keyboard that most graphics programs require a mouse.

The buttons on the mouse are used to select items at which the mouse points. You position the pointer on an object on the screen, for example, on a menu or a tool in a paint program, and then you press the mouse button to "select" it. Mice are also used to load documents into a program: you put the pointer on the file name and **double-click** on the name – that is, you press a mouse button twice in rapid succession.

A scanner converts text or pictures into electronic codes that can be manipulated by the computer.

In a flatbed scanner, the paper with the image is placed face down on a glass screen similar to a photocopier. Beneath the glass are the lighting and measurement devices. Once the scanner is activated, it reads the image as a series of dots and then generates a digitized image that is sent to the computer and stored as a file. The manufacturer usually includes software which offers different ways of treating the scanned image.

A colour scanner operates by using three rotating lamps, each of which has a different coloured filter: red, green and blue. The resulting three separate images are combined into one by appropriate software.

A scanner "sees" images and translates them into a form that can be understood by the computer.

Text exercises

1. Here are some basic mouse actions. Match the terms in the box with the explanations below.

a) click	b) double-click	c) drag

1. Position the pointer on something, then rapidly press and release the mouse button twice. (You do this to load a program, open a document or select text or graphics.)
2. Position the pointer on something, hold down the mouse button and move the mouse to the desired position, then release the button. (You do this to move an image to a new location on the screen.)
3. Position the pointer on something, then press and release the mouse button. (You do this to place the insertion point, to choose an option, or to close a window.)

2. Answer the questions on the text.

a) What can be determined as an input device?
b) What input devices do you know?
c) What is a mouse?
d) What happens when the mouse slides around on your desktop?
e) What makes the mouse especially useful?
f) Why are mice so widely used in graphics applications?
g) What are the buttons on the mouse used for?
h) What does a scanner do?
i) What happens once a flatbed scanner is activated?
j) How does a colour scanner operate?

4. Retell the text.

TEXT 2
Read and translate the text below.

VIEWING THE OUTPUT
We interact with computers by entering instructions and data into them. After this information has been processed internally, we can see the results on the **visual display unit** or **VDU**. To obtain a permanent copy of these results, we can use

plotters, printers or video recorders. In this interactive process with the computer, the **screen** plays an important part.

   The monitor. The characters pictures that we see on the screen are made up of dots, also called picture elements (pixels). The total number of pixels in which the display is divided both horizontally and vertically is known as the **resolution**. If the number of pixels is very large, we obtain a high resolution display and therefore a sharp image. If the number of pictures is small, a low resolution is produced.

   Typical resolutions are 640 x 480 or 1,024 x 768 pixels. Pixel density affects the image: a larger number of pixels gives a much clearer image.

   The **cathode ray tube** of the monitor is very similar to that of a TV set. Inside the tube there is an electron beam which scans the screen and turns on or off the pixels that make up the image. The beam begins in the top left corner, and scans the screen from left to right in a continuous sequence, similar to the movement of our eyes when we read, but much faster. This sequence is repeated 50, 60 or 75 times per second, depending on the system. If the rate of this repetition is low, we can perceive a flickering, unsteady screen, which can cause eye fatigue. However, a fast-moving 75 Hz "refresh rate" eliminates this annoying flicker.

   What we see on the screen is created and stored in an area of RAM, so that there is a memory cell allocated to each pixel. This type of display is called **bit-mapped**. On monochrome monitors, bits 0 are visualized as white dots, and bits 1 as black dots.

   On colour displays, there are three electron guns at the back of the monitor's tube. Each electron gun shoots out a beam of electrons; there is one beam for each of the three primary colours: red, green and blue. These electrons strike the inside of the screen which is coated with substances called phosphors that glow when struck by electrons. Three different phosphor materials are used – one each for red, green and blue. To create different colours, the intensity of each of the three electron beams is varied.

   The monitor is controlled by a separate circuit board, known as the display adaptor, which plugs into the motherboard of the computer. Different boards drive different types of displays. For example, the **VGA** (video graphics array) card has become a standard for colour monitors.

   Portable computers use a flat **liquid crystal display** (LCD) instead of a picture tube. An LCD uses a grid of crystals and polarizing filters to show the image. The crystals block the light in different amounts to generate the dots in the image.

Text exercises

1. Read the text again and answer these questions.
   a) According to the writer, what is the importance of "pixel resolution"?
   b) Which unit of frequency is used to measure the refresh rate of a monitor?
   c) In the writer's opinion, why can a low refresh rate produce eye fatigue?
   d) What substance is hit by electrons in a monitor?
   e) What is the standard display system for many PCs?
   f) What does "LCD" stand for?

g) What type of computers use LCD displays?

2. Match the terms in the box with the appropriate explanation or definition below.

a) resolution; b) liquid crystal display; c) VDU; d) printer; e) VGA; f) plotter; g) cathode ray tube

1) It displays images generated by a computer or other electronic device.
2) It is an output device that prints paper documents
3) It is a printer designed for printing vector graphics. Instead of printing individual dots on the paper, it draws continuous lines. This makes it ideal for printing architectural blueprints, engineering designs, etc.
4) This term can describe either how many pixels a monitor can display or how fine a printer can print.
5) It is the technology used in traditional computer monitors and televisions. The image on this type of a display is created by firing electrons from the back of the tube to phosphors located towards the front of the display.
6) It is a flat panel display technology commonly used in TVs and computer monitors. It is also used in screens for mobile devices, such as laptops, tablets, and smartphones.
7) It is the standard monitor or display interface used in most PCs.

3. Retell the text.

TEXT 3
5 TECHNOLOGY TRENDS TO WATCH IN 2019

Technology trends that will influence industries and consumers in 2019 and everyone needs to know.

1. Machine Learning will advance <u>Artificial Intelligence (AI)</u>

Artificial Intelligence (AI) innovations will continue to bring scientific breakthroughs, in part, thanks to the vast amounts of data that new technologies have been collecting and is now available. In 2019, Machine Learning and Artificial Intelligence will be embedded in the business platform creating and enabling smart business operations.

In the Artificial Intelligence space, China is going to leave the U.S. behind, emerging as a leader in AI developments and applications. Advances in Machine Learning technology and algorithm training will result in new and more advanced AI. Autonomous vehicles and robotics are the two industries that will see the most rapid developments during 2019.

In 2019, there is going to be a convergence of Artificial Intelligence, Machine Learning, and Deep Learning in business applications. As AI and learning

technologies get to work together in order to reach better results, AI will have greater accuracy at all levels.

So far, humans have only developed Narrow Artificial Intelligence. A superior AI, though, is in the future of mankind. How far should humans go with AI development is still a subject of controversy. Is this really going to be mankind's last invention?

2. *Quantum Computing (Supercomputing)*

Quantum Computing, still an emerging technology, is one of the most fascinating things researchers, organizations, and governments have been working on in this century so far. The race toward building the first fully-functional, fully-working quantum computer (also called supercomputer) is on.

With its impressive computational power quantum computers will most like be a cloud service in the near future rather than on-premise machines. IBM is already offering cloud-based quantum computing services.

The first quantum computer is going to have a significant advantage over the others. In 2019, the competence to achieve supercomputer supremacy will intensify. As a consequence, the last mile in the race will remain mostly secretive, for obvious reasons.

3. *Augmented Reality (AR) and Virtual Reality (VR)*

Advances in Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR), all of which can be summarized in R+, will continue to be at the forefront of attention during 2019 with some fascinating new practical applications for industries.

R+, which once was only found in video gaming has been quickly advancing to become a useful tool in industries such as engineering design, manufacturing, healthcare, space exploration, and many others.

In 2019, Virtual Reality is going to open up to innovative industrial applications that will change how people work and collaborate across geographies. Augmented Reality has been rising in the Virtual Reality's shadow for the past year. But in 2019, AR is set to grow exponentially.

4. *Global Internet of Things (IoT) security breach*

Hackers never sleep. Everyone in the cybersecurity industry knows that. As long as you connect something to the Internet it immediately becomes vulnerable.

In the past years, we have seen how hackers have turned to unsecure Internet of Things (IoT) devices to create an extensive botnet which then they could use to push enough traffic to take down Dyn, the DNS provider. As a way to refresh your memory, here is how the DDoS attack using IoT devices happened in 2016.

A quick look at the news tells us that not much has been learned. However, the great number of security breaches occurred during 2018 should serve as an alert of what can happen at a global scale in 2019 if organizations don't take the necessary precautions.

Analyst firm Gartner forecasts that 20.4 billion connected things will be in use worldwide by 2020. And with the rise of autonomous things – I will call this the

Internet of Autonomous Things (IoAT) – there is a good chance that many of these things will show a certain level of weak security.

In 2019, it will be paramount for IoT manufacturers and all of their supply chain to dramatically increase the security in all the products that come out to market. It can be a connected refrigerator, a robot, a drone, a vehicle, or a health tracker. Manufacturers must implement a level of security that keeps hackers at bay. Otherwise, there is a good chance we are going to witness a global IoT security breach in 2019.

5. *Blockchain technology*

In 2019, for the delight of organizations, Blockchain is going to bring the first enterprise applications in active use. The most innovative corporations will start using Blockchain as a way to improve collaboration.

Blockchain in 2019 comes out cryptocurrency transaction and becomes an integral part of the business platform. Blockchain enables transactional transparency across a variety of business functions. In 2019, Blockchain will be present in many industries at the core of business innovation.

GRAMMAR
Tense Revision: Future Tenses

Ex. 1. Раскройте скобки, употребляя глаголы в одном из будущих времен: *Future Simple, Future Continuous* или *Future Perfect.*

1. I (to do) my homework tomorrow. 2. I (to do) my homework at six o'clock tomorrow. 3. I (to do) my homework by six o'clock tomorrow. 4. When I come home tomorrow, my family (to have) supper. 5. When you come to my place tomorrow, I (to read) your book. I (to do) my homework by the time you come. 6. Don't come to my place tomorrow. I (to write) a composition the whole evening. 7. I (not to go) to the cinema tomorrow. I (to watch) TV the whole evening. 8. What you (to do) tomorrow? 9. What you (to do) at eight o'clock tomorrow? 10. You (to play) volleyball tomorrow? 11. You (to do) this work by next Sunday? 12. When you (to go) to see your friend next time? 13. How many pages you (to read) by five o'clock tomorrow? 14. Tomorrow I (to begin) doing my homework as soon as I come from school. I (to do) my homework from three till six. My father (to come) home at seven o'clock tomorrow. I (to do) all my homework by the time he comes, and we (to go) for a walk together.

Tense Revision: All Tenses

Ex. 2. Раскройте скобки, употребляя глаголы в одном из следующих времен: *Present Continuous, Present Simple, Past Simple* или *Future Simple.*

1. Mother (to cook) a very tasty dinner yesterday. 2. Tomorrow Nick (not to go) to school. 3. Look! My friends (to play) football. 4. Kate (not to write) letters every day. 5. You (to see) your friend yesterday? 6. Your father (to go) on a business trip last month? 7. What Nick (to do) yester-1 day? 8. When Nick (to get) up every morning?

9. Where your mother (to go) tomorrow? 10. I (to invite) my friends to come to my place tomorrow. 11. He (not to play) the piano tomorrow. 12. We (to see) a very good film last Sunday. 13. Your mother (to cook) every day? 14. We (to make) a fire last summer. 15. I (to spend) last summer at the seaside. 16. Where you (to spend) last summer? 17. Where he (to spend) next summer? 18. What mother (to do) now? – She (to cook) dinner. 19. I (not to play) computer games yesterday. 20. Last Sunday we (to go) to the theatre. 21. I (to (meet) my friend yesterday. 22. I (to write) a letter to my cousin yesterday. 23. You (to write) a dictation tomorrow? 24. I (not to write) a report now.

Ex. 3. Раскройте скобки, употребляя глаголы в *Present Perfect* или *Past Simple.*
1. I already (to do) my homework. Now I can go for a walk. 2. I (to do) my homework yesterday. 3. He just (to come) home. 4. He (to come) home a minute ago. 5. Nick (to play) football yesterday. 6. She already (to come) from school. Now she is doing her homework. 7. I (to read) this book last year. 8. I (to read) this book this year. 9. I never (to be) to Washington. 10. You ever (to be) to New York? 11. You ever (to see) the eruption of a volcano? 12. I (not yet to eat) today. 13. He (not to eat) yesterday. 14. You (to play) the piano yesterday? 15. You (to play) the piano today? 16. What you (to prepare) for today? 17. Look at this bird-house. Mike (to make) it himself. He (to make) it last Sunday. 18. Where you (to put) my pen? I cannot find it. 19. You (to see) Mary today? 20. When you (to see) Mary? – I (to see) her last week. 21. Your mother (to promise) to take you to the theatre? 22. Look at my new dress! I (to make) it myself. 23. He is not at school today, he (to fall) ill. – When he (to fall) ill? – He (to fall) ill yesterday.

Ex. 4. Раскройте скобки, употребляя глаголы в *Present Perfect, Present Simple, Present Continuous, Past Simple* или *Past Continuous.*
1. They (to go) to the Hermitage last week. 2. They (to be) to the Hermitage twice this week. 3. After school yesterday he (to come) home, (to have) dinner, (to read) an article from the latest magazine and (to begin) doing his homework. 4. When your friend (to return) from the south? – She (to return) yesterday. – You (to go) to the station to meet her? – No, I.... I (to be) too busy. 5. With whom you (to discuss) this question yesterday? 6. I (to see) this film this week. I like it very much. 7. When I (to enter) the kitchen, I (to see) that my mother (to stand) at the table and (to cut) some cabbage. She (to cook) dinner. 8. As soon as I (to hear) a cry, I (to run) out of the room and (to see) that a child (to lie) on the ground and (to cry). "What (to happen)? Why you (to cry)? You (to hurt) yourself?" I asked. 9. As soon as I (to see) him, I (to understand) that he (to work) hard. He (to write) something and (not to notice) anything. 10. When I (to come) home yesterday, the children (to run) and (to sing) merrily. "We (to learn) a new song!" they cried. 11. When the young man (to enter) the room, she (to look) at him in surprise. "What you (to want) to tell me?" she (to say). "Why you (to come)?" 12. It (to rain) hard when I (to leave) home yesterday, so I (to return), (to put) on my raincoat and (to start) again. 13. Your brother (to return) from the north? – Yes, he (to come) a few days ago. 14. You (to be) to the Crimea?

When you (to be) there? – I (to be) there in 1993. 15. Where (to be) your brother? – He just (to come) home. He (to take) a shower in the bathroom now.

Ex. 5. Раскройте скобки, употребляя глаголы в *Present Perfect, Past Simple, Past Continuous* или *Past Perfect.*
1. They (to tell) me yesterday that you (to get) an excellent mark. 2. When you (to receive) a letter from your friend? 3. Our grandmother (to cook) dinner from twelve till three yesterday. 4. Look! What beautiful flowers she (to buy)! 5. They (to travel) along the coast of Africa last year. 6. We (not to see) each other for ages. 7. They (to eat) all the apples which I (to bring). 8. When the children (to have) dinner, they (to go) for a walk. 9. Last summer we (to live) in the country and (to go) to the river every day. 10. My sister (to spend) a lot of money yesterday. 11. She is so upset: she (to lose) the key to the front door. 12. By the 1st of September all the children (to return) from the country. 13. Columbus (to discover) America 500 years ago. 14. Columbus (not to know) that he (to discover) America. 15. I already (to read) five English books. 16. He (to discuss) the problem with a lot of people before he (to take) a decision. 17. Mother (to bake) a delicious cake! Sit down at the table and let's eat it! 18. She (to read) an English book the whole evening yesterday. 19. I never (to be) to Greece. 20. You ever (to be) to the Niagara Falls? 21. At this time yesterday they (to sit) on the sofa and (to listen) to their grandmother who (to tell) them fairy-tales. 22. My friend just (to ring) me up from London. 23. I (to stand) at the tram-stop when it (to begin) raining. 24. We (not to skate) since last winter.

Ex. 6. Раскройте скобки, употребляя глаголы в одном из следующих времен: *Present, Past, Future Simple; Present, Past Continuous; Present, Past Perfect.*
1. When you (to come) to see us? – I (to come) tomorrow if I (not to be) busy. 2. I (not to like) apples. 3. He (to come) home at five o'clock yesterday. 4. I (to ring) you up as soon as I (to come) home tomorrow. 5. I (to show) you my work if you (to like). 6. He (to come) home by six o'clock yesterday. 7. Pete certainly (to help) you with your English if you (to ask) him. 8. This little boy never (to see) a crocodile. 9. Send me a telegram as soon as you (to arrive). 10. Let's go for a walk. The rain (to stop) and the sun (to shine). 11. If you (to help) me, I (to do) this work well. 12. I always (to get) up at eight o'clock, but tomorrow I (to get) up a little later. 13. What you (to read) now? – I (to read) Tom's book. I (to be) in a hurry. Tom soon (to come), and I (to want) to finish reading the book before he (to come). 14. As soon as you (to see) your friend, tell him that I (to want) to see him. 15. When I (to come) home yesterday, my brother (to sleep).

Assignment 1

1. Read and translate the text.

THE EARLY YEARS

Until the late 1970s, the computer was viewed as a massive machine that was useful to big business and big government but not to the general public. Computers were too cumbersome and expensive for private use, and most people were intimidated by them. As technology advanced, this was changed by a distinctive group of engineers and entrepreneurs who rushed to improve the designs of then current technology and to find ways to make the computer attractive to more people. Although these innovators of computer technology were very different from each other, they had a common enthusiasm for technical innovation and the capacity to foresee the potential of computers. This was a very competitive and stressful time, and the only people who succeeded were the ones who were able to combine extraordinary engineering expertise with progressive business skills and an ability to foresee the needs of the future.

Much of this activity was centered in the Silicon Valley in northern California where the first computer-related company had located in 1955. That company attracted thousands of related businesses, and the area became known as the technological capital of the world. Between 1981 and 1986, more than 1000 new technology-oriented businesses started there. At the busiest times, five or more, new companies started in a single week. The Silicon Valley attracted many risk-takers and gave them an opportunity to thrive in an atmosphere where creativity was expected and rewarded.

Robert Noyce was a risk-taker who was successful both as an engineer and as an entrepreneur. The son of an Iowa minister, he was informal, genuine, and methodical. Even when he was running one of the most successful businesses in the Silicon Valley, he dressed informally and his office was an open cubicle that looked like everyone else's. A graduate of the Massachusetts Institute of Technology (MIT), he started working for one of the first computer-related businesses in 1955. While working with these pioneers of computer engineering, he learned many things about computers and business management.

As an engineer, he co-invented the integrated circuit, which was the basis for later computer design. This integrated circuit was less than an eighth of an inch square but had the same power as a transistor unit that was over 15 inches square or a vacuum tube Unit that was 6.5 feet square. As a businessman, Noyce co-founded Intel, one of the most successful companies in the Silicon Valley and the first company to introduce the microprocessor. The microprocessor chip became the heart of the computer, making it possible for a large computer system that once filled an

entire room to be contained on a small chip that could be held in one's hand. The directors of Intel could not have anticipated the effects that the microprocessor would have on the world. It made possible the invention of the personal computer and eventually led to the birth of thousands of new businesses. Noyce's contributions to the development of the integrated circuit and the microprocessor earned him both wealth and fame before his death in 1990. In fact, many people consider his role to be one of the most significant in the Silicon Valley story.

The two men who first introduced the personal computer (PC) to the marketplace had backgrounds unlike Robert Noyce's. They had neither prestigious university education nor experience in big business. Twenty-year-old Steven Jobs and twenty-four-year-old Stephen Wozniak were college' drop-outs who had collaborated on their first project as computer hobbyists in a local computer club. Built in the garage of Jobs' parents, this first personal computer utilized the technology of Noyce's integrated circuit. It was typewriter-sized, as powerful as a much larger computer, and inexpensive to build. To Wozniak the new machine was a gadget to share with other members of their computer club. To Jobs, however, it was a product with great marketing potential for homes and small businesses. To raise the $1300 needed to fill their first orders Jobs sold his Volkswagen bus and Wozniak sold his scientific calculator. Wozniak built and delivered the first order of 100 computers in ten days. Lacking funds, he was forced to use the least expensive materials, the fewest chips, and the most creative arrangement of components. Jobs and Wozniak soon had more orders than they could fill with their makeshift production line.

Jobs and Wozniak brought different abilities to their venture: Wozniak was the technological wizard, and Jobs was the entrepreneur. Wozniak designed the first model, and Jobs devised its applications and attracted interest from investors and buyers. Wozniak once admitted that without Jobs he would never have considered selling the computer or known how to do it. "Steve didn't do one circuit, design or piece of code. He's not really been into computers, and to this day he has never gone through a computer manual. But it never crossed my mind to sell computers. It was Steve who said, 'Let's hold them up and sell a few.

From the very beginning, Apple Computer had been sensitive to the needs of a general public that is intimidated by high technology. Jobs insisted that the computers be light, trim, and made in muted colors. He also insisted that the language used with the computers be "user-friendly" and that the operation be simple enough for the average person to learn in a few minutes. These features helped convince a skeptical public that the computer was practical for the home and small business. Jobs also introduced the idea of donating Apple Computers to thousands of California schools, thereby indirectly introducing his product into the homes of millions of students. Their second model, the Apple II, was the state-of-the-art PC in home and small

business computers from 1977 to 1982. By 1983 the total company sales were almost $600 million, and it controlled 23 percent of the worldwide market in personal computers.

As the computer industry began to reach into homes and small businesses around the world, the need for many new products for the personal computer began to emerge. Martin Alpert, the founder of Tecmar Inc., was one of the first people to foresee this need. When IBM released its first personal computer in 1981, Alpert bought the first two models. He took them apart and worked twenty-four hours a day to find out how other products could be attached to them. After two weeks, he emerged with the first computer peripherals for the IBM PC, and he later became one of the most successful creators of personal computer peripherals. For example, he designed memory extenders that enabled the computer to store more information, and insert able boards that allowed people to use different keyboards while sharing the same printer. After 1981, Tecmar produced an average of one new product per week.

Alpert had neither the technical training of Noyce nor the computer clubs of Jobs and Wozniak to encourage his interest in computer engineering. His parents were German refugees who worked in a factory and a bakery to pay for his college education. They insisted that he study medicine even though his interest was in electronics. Throughout medical school he studied electronics passionately but privately. He became a doctor, but practiced only part time while pursuing his preferred interest in electronics. His first electronics products were medical instruments that he built in his living room. His wife recognized the potential of his projects before he did, and enrolled in a graduate program in business management so she could run his electronics business successfully. Their annual sales reached $1 million, and they had 15 engineers working in their living room before they moved to a larger building in 1981. It wasn't until 1983 that Alpert stopped practicing medicine and gave his full attention to Tecmar. By 1984 Tecmar was valued at $150 million.

Computer technology has opened a variety of opportunities for people who are creative risk-takers. Those who have been successful have been alert technologically, creatively, and financially. They have known when to use the help of other people and when to work alone. Whereas some have been immediately successful, others have gone unrewarded for their creative and financial investments; some failure is inevitable in an environment as competitive as the Silicon Valley. Rarely in history have so many people been so motivated to create. Many of them have been rewarded greatly with fame and fortune, and the world has benefited from this frenzy of innovation.

Text exercises
1. Google the meaning of unknown words and word combinations.

2. Write down 30 basic phrases from the text and give their translation.

3. Retell the text using the basic phrases.

<p style="text-align:center">Assignment 2</p>

1. Read and translate the text.

<p style="text-align:center">COMPUTER CRIMES</p>

More and more, the operations of our businesses, governments, and financial institutions are controlled by information that exists only inside computer memories. Anyone clever enough to modify this information for his own purposes can reap substantial re wards. Even worse, a number of people who have done this and been caught at it have managed to get away without punishment.

These facts have not been lost on criminals or would-be criminals. A recent Stanford Research Institute study of computer abuse was based on 160 case histories, which probably are just the proverbial tip of the iceberg. After all, we only know about the unsuccessful crimes. How many successful ones have gone undetected is anybody's guess?

Here are a few areas in which computer criminals have found the pickings all too easy.

Banking. All but the smallest banks now keep their accounts on computer files. Someone who knows how to change the numbers in the files can transfer funds at will. For instance, one programmer was caught having the computer transfer funds from other people's accounts to his wife's checking account. Often, tradition ally trained auditors don't know enough about the workings of computers to catch what is taking place right under their noses.

Business. A company that uses computers extensively offers many opportunities to both dishonest employees and clever outsiders. For instance, a thief can have the computer ship the company's products to addresses of his own choosing. Or he can have it issue checks to him or his confederates for imaginary supplies or services. People have been caught doing both.

Credit Cards. There is a trend toward using cards similar to credit cards to gain access to funds through cash-dispensing terminals. Yet, in the past, organized crime has used stolen or counterfeit credit cards to finance its operations. Banks that offer after-hours or remote banking through cash-dispensing terminals may find themselves unwillingly subsidizing organized crime.

Theft of Information. Much personal information about individuals is now stored in computer files. An unauthorized person with access to this information could use it for blackmail. Also, confidential information about a company's products

or operations can be stolen and sold to unscrupulous competitors. (One attempt at the latter came to light when the competitor turned out to be scrupulous and turned in the people who were trying to sell him stolen information.)

Software Theft. The software for a computer system is often more expensive than the hardware. Yet this expensive software is all too easy to copy. Crooked computer experts have devised a variety of tricks for getting these expensive programs printed out, punched on cards, recorded on tape, or otherwise delivered into their hands. This crime has even been perpetrated from remote terminals that access the computer over the telephone.

Theft of Time-Sharing Services. When the public is given access to a system, some members of the public often discover how to use the system in unauthorized ways. For example, there are the "phone freakers" who avoid long distance telephone charges by sending over their phones control signals that are identical to those used by the telephone company.

Since time-sharing systems often are accessible to anyone who dials the right telephone number, they are subject to the same kinds of manipulation.

Of course, most systems use account numbers and passwords to restrict access to authorized users. But unauthorized persons have proved to be adept at obtaining this information and using it for their own benefit. For instance, when a police computer system was demonstrated to a school class, a precocious student noted the access codes being used; later, all the student's teachers turned up on a list of wanted criminals.

Perfect Crimes. It's easy for computer crimes to go undetected if no one checks up on what the computer is doing. But even if the crime is detected, the criminal may walk away not only unpunished but with a glowing recommendation from his former employers.

Of course, we have no statistics on crimes that go undetected. But it's unsettling to note how many of the crimes we do know about were detected by accident, not by systematic audits or other security procedures. The computer criminals who have been caught may have been the victims of uncommonly bad luck.

For example, a certain keypunch operator complained of having to stay overtime to punch extra cards. Investigation revealed that the extra cards she was being asked to punch were for fraudulent transactions. In another case, disgruntled employees of the thief tipped off the company that was being robbed. An undercover narcotics agent stumbled on still another case. An employee was selling the company's merchandise on the side and using the computer to get it shipped to the buyers. While negotiating for LSD, the narcotics agent was offered a good deal on a stereo!

Unlike other embezzlers, who must leave the country, commit suicide, or go to jail, computer criminals sometimes brazen it out, demanding not only that they not be prosecuted but also that they be given good recommendations and perhaps other benefits, such as severance pay. All too often, their demands have been met.

Why? Because company executives are afraid of the bad publicity that would result if the public found out that their computer had been misused. They cringe at the thought of a criminal boasting in open court of how he juggled the most confidential records right under the noses of the company's executives, accountants, and security staff. And so another computer criminal departs with just the recommendations he needs to continue his exploits elsewhere.

Text exercises
1. Google the meaning of unknown words and word combinations.

2. Write down 30 basic phrases from the text and give their translation.

3. Retell the text using the basic phrases.

Assignment 3

1. Read and translate the text.

COMPUTERS AND DIGITAL COMPUTERS

Generally, any device that can perform numerical calculations, even an adding machine, may be called a computer but nowadays this term is used especially for digital computers. Computers that once weighed 30 tons now may weigh as little as 1.8 kilograms. Microchips and microprocessors have considerably reduced the cost of the electronic components required in a computer. Computers come in many sizes and shapes such as special-purpose, laptop, desktop, minicomputers, supercomputers.

Special-purpose computers can perform specific tasks and their operations are limited to the programmes built into their microchips. There computers are the basis for electronic calculators and can be found in thousands of electronic products, including digital watches and automobiles. Basically, these computers do the ordinary arithmetic operations such as addition, subtraction, multiplication and division.

General-purpose computers are much more powerful because they can accept new sets of instructions. The smallest fully functional computers are called laptop computers. Most of the general-purpose computers known as personal or desktop computers can perform almost 5 million operations per second.

Today's personal computers are known to be used for different purposes: for testing new theories or models that cannot be examined with experiments, as valuable educational tools due to various encyclopedias, dictionaries, educational programmes, in book-keeping, accounting and management. Proper application of computing equipment in different industries is likely to result in proper management, effective distribution of materials and resources, more efficient production and trade.

Minicomputers are high-speed computers that have greater data manipulating capabilities than personal computers do and that can be used simultaneously by many users. These machines are primarily used by larger businesses or by large research and university centers. The speed and power of supercomputers, the highest class of computers, are almost beyond comprehension, and their capabilities are continually being improved. The most complex of these machines can perform nearly 32 billion calculations per second and store 1 billion characters in memory at one time, and can do in one hour what a desktop computer would take 40 years to do. They are used commonly by government agencies and large research centers. Linking together networks of several small computer centers and programming them to use a common language has enabled engineers to create the supercomputer. The aim of this technology is to elaborate a machine that could perform a trillion calculations per second.

here are two fundamentally different types of computers: analog and digital. The former type solver problems by using continuously changing data such as voltage. In current usage, the term "computer" usually refers to high-speed digital computers. These computers are playing an increasing role in all branches of the economy.

Digital computers based on manipulating discrete binary digits (1s and 0s). They are generally more effective than analog computers for four principal reasons: they are faster; they are not so susceptible to signal interference; they can transfer huge data bases more accurately; and their coded binary data are easier to store and retrieve than the analog signals.

For all their apparent complexity, digital computers are considered to be simple machines. Digital computers are able to recognize only two states in each of its millions of switches, "on" or "off", or high voltage or low voltage. By assigning binary numbers to their states, 1 for "on" and 0 for "off", and linking many switches together, a computer can represent any type of data from numbers to letters and musical notes. It is this process of recognizing signals that is known as digitization. The real power of a computer depends on the speed with which it checks switches per second. The more switches a computer checks in each cycle, the more data it can recognize at one time and the faster it can operate, each switch being called a binary digit or bit.

A digital computer is a complex system of four functionally different elements: 1) the central processing unit (CPU), 2) input devices, 3) memory-storage devices called disk drives, 4) output devices. These physical parts and all their physical components are called hardware.

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The power of computers greatly on the characteristics of memory-storage devices. Most digital computers store data both internally, in what is called main memory, and externally, on auxiliary storage units. As a computer processes data and instructions, it temporarily stores information internally on special memory microchips. Auxiliary storage units supplement the main memory when programmes are too large and they also offer a more reliable method for storing data. There exist different kinds of auxiliary storage devices, removable magnetic disks being the most widely used. They can store up to 100 megabytes of data on one disk, a byte being known as the basic unit of data storage.

Output devices let the user see the results of the computer's data processing. Being the most commonly used output device, the monitor accepts video signals from a computer and shows different kinds of information such as text, formulas and graphics on its screen. With the help of various printers, information stored in one of

the computer's memory systems can be easily printed on paper in a desired number of copies.

Programmes, also called software, are detailed sequences of instructions that direct the computer hardware to perform useful operations. Due to a computer's operating system hardware and software systems can work simultaneously. An operating system consists of a number of programmes coordinating operations, translating the data from different input and output devices, regulating data storage in memory, transferring tasks to different processors, and providing functions that help programmers to write software. In large corporations, software is often written by groups of experienced programmers, each person focusing on a specific aspect of the total project. For this reason, scientific and industrial software sometimes costs much more than do the computers on which the programmes run.

Text exercises

1. Google the meaning of unknown words and word combinations.

2. Write down 30 basic phrases from the text and give their translation.

3. Retell the text using the basic phrases.

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