



Англійська мова

(за професійним спрямуванням)

Методичні вказівки до практичних занять
для студентів спеціальності 122 «Комп'ютерні науки»
денної форми навчання



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А

Затверджено до видання методичною радою ВСП «КПЕФК Луцького НТУ», протокол № ____ від « ____ » _____ 2021 року.

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Видання містить методичні вказівки до практичних занять, оригінальні тексти із спеціальності, базовий лексичний мінімум, нормативну граматику англійської мови, завдання для самоконтролю та самостійної роботи.

Передбачене для підготовки фахових молодших бакалаврів із спеціальності 122 «Комп'ютерні науки».

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Передмова

Методичні вказівки призначені для вивчення англійської мови (за професійним спрямуванням) студентами спеціальності «Комп'ютерні науки» денної форми навчання.

Методичні вказівки складено згідно з вимогами навчальної програми з іноземної мови (за професійним спрямуванням) для підготовки молодших спеціалістів комп'ютерного профілю і охоплюють базовий лексичний мінімум та нормативну граматику англійської мови.

Ціль вивчення англійської мови (за професійним спрямуванням) у коледжі полягає у практичному оволодінні мовою, навиками читання і перекладу літератури помірної складності зі спеціальності й навиками усної мови із актуальних фахових тем передбачених програмою, і охоплює основні питання пов'язані з історією виникнення комп'ютера, основними комплектуючими частинами комп'ютера, різними видами комп'ютерів, програмним та апаратним забезпеченням, програмуванням, мовами програмування, Інтернетом і т. д.

Методичні вказівки складаються із 25 текстів-тем, які містять окрему комп'ютерну проблему – тему, і включають автентичні, спеціалізовані тексти, що є основою для ведення бесіди або нескладної дискусії (призначені для закріплення активної лексики певної теми) та тексти для індивідуальної роботи студентів, які містять додаткову інформацію до кожної теми (для самостійного опрацювання). До текстів пропонуються передтекстові і післятекстові вправи та завдання на відпрацювання мовленнєвих навичок і вмінь, використання лексичного матеріалу, що вивчається. Побудова системи завдань до кожного тексту визначається методичним призначенням цих текстів. Підібрані вправи дають можливість не лише краще закріпити даний матеріал, але й проконтролювати навик усного та писемного мовлення по даному матеріалі. У процесі розробки системи завдань і вправ використовувались елементи функціонально-комунікативного навчання в іноземній мові, при якій явище мови (лексика і граматики) розглядаються не тільки як система правил і особливостей, але й і як система комунікативних функцій.

Методичні вказівки слугують введенням у спеціальність, оскільки відображають тісні міжпредметні зв'язки з інформатикою, комп'ютерною схемотехнікою та архітектурою комп'ютерів, програмуванням, комп'ютерною графікою, що сприяє формуванню професійної компетенції у процесі вивчення англійської мови (за професійним спрямуванням).

У кінці методичних вказівок подається глосарій комп'ютерних термінів для полегшення їх розуміння та їх значень.

Знання комп'ютера важливі в роботі кожного спеціаліста, тим паче техніка-програміста. А інформованість, знання комп'ютера та англійської мови – це статус сучасної освіченої ділової людини.

Методичні вказівки можуть бути використані студентами фахової передвищої освіти, викладачами іноземної мови, абітурієнтами ЗВО, учнями спеціалізованих шкіл із поглибленим вивченням англійської мови, слухачами курсів іноземних мов.

Introduction

Knowledge is a Power

We have read that knowledge is a power. The more man knows, the greater power he has. But how much knowledge do we need? Can we have too much knowledge?

Sometimes a boy or a girl says, “Why do I have to know this? I don’t need it.” Do you think that people should know only those things which they need for their work?

It seems to me a person like that will be useful in his own limited field. But when he moves out of his own speciality he has nothing interesting to say to other people. It is impossible to describe such person as well-educated.

As you know today’s ideal is the all-round development of the individual. To attain this ideal you must have all-round knowledge. Of course, we cannot know everything, but we must always try to acquire knowledge. If you remember history, you know how man acquired knowledge. He did it little by little.

In the modern age of electronics and computers, the road to knowledge is open to everybody. The only thing you need is a desire to learn. As John Ruskin, an English writer, said, “If you want knowledge, you must toil.”

There is a time for everything. Time is a very valuable thing. Many famous people have spoken or written about how to save time. For example, Philip Chesterfield, an English writer said, “I recommend you to take care of the minutes, for the hours will take care of themselves”, “Know the true value of time, enjoy moment of it.” “Never put off till tomorrow what can do today.”

Let us recall some more proverbs about how to value time. Here are they: “Time flies.” This means that time passes very quickly – so we must value it.

“Everything has its time.”

“Time lost cannot be won again.”

“To save time is to lengthen life.”

“Lost time is never found again.”

As you see, all these proverbs tell us that we must value time. Time should be spent on useful things.

To have knowledge isn’t enough. To know something is, first of all, to be able to use knowledge. You must know how to use knowledge.

Nowadays in order to get the necessary information and to save time it is important to know the computer.

Vocabulary:

A limited field – обмежена галузь,

to acquire – набувати, одержувати,

to describe – описувати,

to move out – рухатись за межі,

well-educated – добре освічений,

a desire – бажання,

all-round knowledge – всесторонні знання,

to toil – трудитися,

a valuable thing – цінна річ,
to value time – цінувати час,
to recall – перераховувати.

Text Study

Exercise 1. Read and translate the word-combinations from the text.

To be useful in one's own limited field, moves out of one's own speciality, the all-round development of the individual, to acquire knowledge, little by little, in the modern age of electronics and computers, a very valuable thing, to value time, to use knowledge, to get the necessary information.

Exercise 2. Complete the sentences.

1. The more man knows, 2. To attain all-round individual you 3. "If you want knowledge, 4. "I recommend you to take care of the minutes, ... , said an English writer Philip Chesterfield. 5. "Never put off till tomorrow 6. "Know the true value of time, 7. To know something is,

Exercise 3. Give Ukrainian equivalents for the following sayings and proverbs, try to remember them.

1. "If you want knowledge, you must toil." 2. "I recommend you to take care of the minutes, for the hours will take care of themselves". 3. "Know the true value of time, enjoy moment of it." 4. "Never put off till tomorrow what can do today." 5. "Everything has its time." 6. "Time lost cannot be won again." 7. "To save time is to lengthen life." 8. "Lost time is never found again."

Exercise 4. Translate into English.

1. Я хочу мати всесторонні знання. 2. Мій друг – добре освічена особа. 3. Ми не можемо знати все, але ми повинні старатися одержувати нові знання. 4. Чим більше людина знає, тим більше вона має влади. 5. У сучасну епоху електроніки і комп'ютерів шлях до знань відкритий для кожного. 6. Час летить дуже швидко, необхідно цінувати час. 7. Всі повинні знати як використовувати знання. 8. Нам необхідно витратити час на корисні речі. 9. Для того, щоб швидко одержувати потрібну інформацію, необхідно знати комп'ютер. 10. Ти не зможеш сказати нічого цікавого іншим людям, якщо будеш мати знання тільки із своєї спеціальності.

Lesson 1

Read and translate the text:

From the History of a Computer

The educated man of 200 years ago did not need to know anything about science. The educated man of 25-30 years ago did not need to know anything about computers. But the educated man of today needs to have some significant knowledge about computers.

The computer is no doubt the most amazing achievement of mankind. It is a data storage system created by a man. A human tells the machine what to do, when to do it and how it should be done.

The word *computer* comes from a Latin word which means *to count*.

Nearly one hundred and fifty years ago there were no such things as computers. Knotted ropes, marks in clay, the abacus are all methods of keeping track of numbers.

In 1833 an English inventor and mathematician Charles Babbage, professor of Cambridge University designed the first computer. The mathematical programme for his machine had been composed by Lord Byron's daughter.

The first programme computer which operated successfully was built in 1939 by H. H. Aiken, professor of Harvard University.

In our country the first electronic digital computer MACM was constructed by the Ukrainian Academician S. O. Lebedev in 1950.

Such computers as BESM, Minsk, Ural, Razdan-3, M-20, M-220, Nairi-3, Strela, Dnieper were created in our country.

Nowadays computers greatly increase man's thinking capabilities of planning, analyzing, computing and controlling. Millions of computers are already in daily use. They penetrate almost into all spheres of our modern society, from nuclear energy production and missile design to the processing of bank checks, weather forecasting, manufacturing, research and medical diagnoses.

There are three kinds of computers: digital, analogue and hybrid. An analogue computer computes by using physical analogue of numerical measurements. A digital computer computes by using numbers or digits. A hybrid computer is a machine which combines some of the properties of digital and analogue computers.

Invention of electronic computers is one of the greatest achievements of mankind. The significance of it can be compared with the invention of the steam-engine and the utilization of atomic energy.

Computers today are running our factories, planning our cities, teaching our children and forecasting our future. The computer solves in seconds the problem generations of mathematicians would need months or years to solve without its help. Computers, like the telephone or electricity have become a common thing of every day used by almost everybody. They have entered our home life. They will help to make up the wife's shopping list, remind the husband of important appointments and anniversaries and answer the telephone.

We often hear that the increasing flood of information is one of the problems of the 21st century. The computer may help to solve it too. In a computerized library of the future requests for information will be answered instantly and as fully as the user wants.

Vocabulary:

Amazing achievement of mankind – дивовижне досягнення людства,
abacus – пахівниця,
knotted ropes – зав'язані на вузол шнурки, шнурові плетіння,
clay – глина,
to keep track of – слідкувати,
an inventor – винахідник,
to compose – складати,
to construct – конструювати, створювати,
digital – цифровий,
to create – створювати,
to increase – збільшувати,
thinking – мислячий, розумний,
capability – здатність, здібність,
to compute – обчислювати,
to penetrate – проникати,
missile – реактивний снаряд, ракета,
to process – обробляти, опрацьовувати,
weather forecast – прогноз погоди,
manufacturing – виробництво,
research – (наукове) дослідження,
analogue computer – аналоговий комп'ютер,
hybrid – змішаний,
numerical – цифровий,
measurements (pl.) – вимірювання,
steam-engine – паровий двигун,
utilization – використання,
significance – значення, важливість,
to astonish – вражати,
to remind – нагадувати,
flood of information – потік інформації.

Comprehensive Questions

1. Did the educated man of 200 years ago need to know anything about science?
2. Where does the word computer come from?
3. What were the ancient methods of keeping track of numbers?
4. Who and when designed the first computer?
5. Who composed the mathematical programme for that machine?
6. When was the first electronic digital computer MACM created in our country?
7. What do the computers greatly increase?
8. Where do computers penetrate nowadays?

9. What are three kinds of computers? How do they work?
10. What are the greatest achievements of mankind?
11. What do the the computers do today?
12. What will the computers help to make up?
13. What is one of the problems of the 21st century?
14. Who will help to solve it?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

To have significant knowledge of science, a date storage system, to operate successfully, the first electronic digital computer, man's thinking capabilities, planning and analyzing, computing and controlling, in daily use, to penetrate into all spheres of modern society, the increasing flood of information, a computerized library.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|--|--------------------------|
| 1. The educated man of today needs to have about computer. | 1. increase |
| 2. It is a created by a man. | 2. daily use |
| 3. The computer is the most of mankind. | 3. compared |
| 4. Nowadays computers greatly ... man's thinking capabilities of planning, analyzing, computing and controlling. | 4. amazing achievement |
| 5. Millions of computers are already in | 5. compute |
| 6. An analogue computer ... by using physical analogue of numerical measurements. | 6. combine |
| 7. A hybrid computer ... some of the properties of digital and analogue computers. | 7. date storage system |
| 8. The significance of the computers can be ... with the invention of the steam-engine. | 8. significant knowledge |

Exercise 3. Complete the sentences finding the end in the right column.

1. The educated man of today needs to	... will be answered instantly and as fully as the user wants.
2. The computer is	... have some significant knowledge of science and about computers.
3. In 1833 an English inventor and mathematician	... planning, analyzing, computing and controlling.
4. Nowadays computers greatly increase man's thinking capabilities of	... running the factories, planning the cities, teaching the children and forecasting our future.
5. There are three kinds of	... the most amazing achievement of

computers	mankind.
6. Computers today are	... designed the first computer.
7. The computers will help to	... digital, analogue and hybrid.
8. In a computerized library of the future request for information	... make up the wife's shopping list, remind the husband of important appointments and anniversaries and answer the telephone.

Exercise 4. Tell what sentences are true, what are false.

1. The educated man of 25-30 years ago need to know something about computers.
2. The computer is no doubt the most amazing achievement of mankind.
3. The word *computer* comes from a German word which means *to count*.
4. In 1833 an English inventor and physists Charles Babbage, professor of Harward University designed the first computer.
5. The mathematical programme for his machine had been composed by Lord Byron's daughter.
6. The first programme computer which operated successfully was built in 1929 by H. H. Aiken, professor of Cambridge University.
7. In our country the first electronic digital computer MACM was constructed by the Ukrainian Academician S. O. Lebedev in 1950.
8. Hundreds of computers are already in daily use.
9. Invention of electronic computers is one of the greatest achievements of mankind.
10. They can't even enter our home life.

Exercise 5. Translate into English.

1. Я впевнений, що комп'ютер є найдивовижнішим досягненням людства.
2. Важливість комп'ютера можна порівняти з винаходом парового двигуна і використанням атомної енергії.
3. Комп'ютер допомагає вирішувати багато складних питань.
4. Мільйони комп'ютерів проникають у всі сфери нашого сучасного суспільства від прогнозу погоди, виробництва, дослідження до медичних діагнозів.
5. Добре освіченій людині сьогодні необхідно мати значні знання щодо комп'ютера.
6. Мільйони людей по всьому світу використовують комп'ютери.
7. Комп'ютер змішаного типу поєднує деякі властивості цифрового та аналогового комп'ютерів.
8. Мені легко обробляти інформацію та проводити обчислення за допомогою комп'ютера.
9. Комп'ютери сьогодні керують фабриками, навчають наших дітей і передбачають наше майбутнє.
10. Перший комп'ютер був спроектований англійським винахідником та математиком Чарльзом Бейбеджом у 1833 році.

Additional Text (for individual work)

Read and translate the text.

Computer Evolution

2000 BC (before Christ) – The abacus emerged in Asia. It allowed people to make calculations using moving beads arranged on a rack. 1642 – Blaise Pascal invented the first mechanical adding machine, a numerical wheel called Pascaline.

1833 – Charles Babbage started to build his Analytical Engine, the forerunner of the modern computer. He was helped by Augusta Ada Byron, who is considered the first computer programmer. 1890 – Herman Hollerith used punch cards in a device which automatically read the US census.

1941 – Konrad Zuse built the first programmable computer, called Z3, working on the binary system.

First generation computers (1945-1954) – The University of Pennsylvania designed ENIAC (UNIVersal Automatic Computer), an electronic computer which used vacuum tubes and was able to calculate at electronic speeds. Those devices were not only bulky, they were also unreliable. The thousands of vacuum tubes emitted large amounts of heat and burned out frequently.

Second generation computers (1955-1964) – Computers used transistors instead of vacuum tubes. So-called second generation computers, which used large numbers of transistors were able to reduce computational time from milliseconds to microseconds, or millionths of seconds. Second-generation computers were smaller, faster and more reliable than first-generation computers. Memories were made of magnetizable cores (the IBM 1401).

Third generation computers (1965-1973) – The first computers using silicon chips went on sale. Intel released the first microprocessor. They could perform many data processing operations in nanoseconds which are billionths of seconds.

Fourth generation computers (1974-2001) – Computers became smaller as more components were squeezed onto microchips. The integrated circuits that are being developed have been greatly reduced in size. This is due to microminiaturization which means that the circuits are much smaller than before; as many as 100 tiny circuits are placed now on a single chip. A chip is a square or rectangular piece of silicon, usually from $\frac{1}{10}$ to $\frac{1}{4}$ inch, upon which several layers of an integrated circuits are etched or imprinted, after which the circuits is encapsulated in plastic or metal.

1975 – Bill Gates and Paul Allen founded Microsoft and wrote a BASIC compiler for the Altair.

1976 – Steve Jobs and Steve Wozniak founded Apple Computer, Inc. The first minicomputer was sold.

1981 – IBM sold the IBM PC, a model that became the standard in personal computers. MS-DOS was the operating system for IBM PCs and compatibles.

1984 – Apple produced the Macintosh, the first computer with a mouse and a graphic user interface (GUI).

1995 – Microsoft launched Windows 95 and Sun Microsystems created Java language.

2001 – Intel launched the Pentium 4 running at 2G Hz.

Fifth generation computers – Fibre optics and optical disks revolutionize the world computers. Artificial Intelligence and voice recognition are incorporated into computer applications; experts start making tiny, superfast computers known as nanocomputers. Some are electronics, others are biochemical, working with bio-chips made of millions of molecules.

Answer the questions to the text.

1. When did the abacus emerge?
2. Who designed ENIAC (UNIVersal Automatic Computer), an electronic computer which used vacuum tubes and was able to calculate speeds?
3. What did the second generation computers use?
4. What could the third generation computers perform?
5. Why did fourth generation computers become smaller in size?
6. What did revolutionize the world of computers?

Lesson 2

Read and translate the text:

What is a Computer?

A computer is an electronic device which executes software programs. It consists of 2 parts – hardware and software. The computer processes input through input devices like mouse and keyboard. The computer displays output through output devices like colour monitor and printer. The size of a computer varies considerably from very small to very big. The speed of computers also has a very large range. Computers have become indispensable in today's world. Millions of people use computers all over the world.

As with any problem-solving tool, you must understand the purposes for which computers can and cannot be used. What is the value of computers to you? Over the last decade, computers have become more powerful, easier to use, and less expensive. Thus, the effort required to apply computers in personal and professional pursuits is much simpler than it was a decade ago.

Like all revolutionary technologies, such as electricity, telephones, and automobiles, computers have been embraced by individuals and organizations rather quickly. Thus, a certain amount of computer literacy is necessary to keep pace with rapid technological advances. Computers, although important, are not an end in themselves. They are simply tools. They are really nothing more than unusually fast and precise machines with an extraordinary ability to remember massive amount of details. The computer's speciality is data processing, performing specific operations on data: adding, subtracting, multiplying, and dividing numbers and comparing them and remembering them. These fundamental operations, conducted in countless combinations at tremendous speed, are the essence of all the computer's enormously varied applications. The computer can thus answer some highly complex questions, although the human being must tell it what to do and how to do it.

A computer is an electronic device that can accept input, process it according to a set of instructions, store the instructions and the results of processing, and produce results as its output.

The facts, numbers, letters, and images input to a computer are called data. The instructions that carry out the processing are called computer programs or software. The output, intended for use and interpretation by people, is called information.

Vocabulary:

Hardware – апаратне забезпечення,
software – програмне забезпечення,
to execute – працювати за допомогою,
indispensable – дуже необхідний,
input device – ввідний прилад,
output device – вивідний прилад,
a decade – десятиліття,
to apply a computer – використовувати комп'ютер,
a pursuit – заняття,
to embrace – залучати,
literacy – грамота, писемність,
to keep pace with ... – йти в ногу з ...,
rapid technological advances – швидкий технологічний рух уперед,
precise machine – точна машина,
to add – додавати,
to subtract – віднімати,
to multiply – множити,
to divide – ділити,
fundamental operations – основні операції,
tremendous speed – величезна швидкість,
enormously varied applications – величезна різноманітність застосувань,
to process – обробляти,
to store the instructions – зберігати інструкції.

Comprehensive Questions

1. What is a computer?
2. What input devices do you know?
3. What output devices do you know?
4. What are computers today?
5. What is necessary to keep pace with rapid technological advances?
6. What is the computer's speciality?
7. What is called the computers programs or software?
8. What do we call information?
9. What is the difference between data and information?
10. What do we call facts, numbers, letters, and images input to a computer?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

An electronic device, to become indispensable in today's world, to apply computers in personal and professional pursuits, a computer literacy, rapid technological advances, precise machines, to remember massive amount of details, fundamental operations, the computer's enormously varied applications, some highly complex questions.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|---|-------------------------------|
| 1. A computer is which executes software programs. | 1. data |
| 2. The computer processes input through like mouse and keyboard. | 2. computer literacy |
| 3. The computer displays output through output devices like | 3. output |
| 4. Computers have become ... in today's world. | 4. computer programs |
| 5. A certain amount of is necessary to keep pace with rapid technological advances. | 5. precise machines |
| 6. Computers are fast and with an extraordinary ability to remember massive amount of details. | 6. input devices |
| 7. A computer is an electronic device that can accept ..., process it according to a set of instructions. | 7. indispensable |
| 8. The facts, numbers, letters, and images input to a computer are called | 8. an electronic device |
| 9. The instructions that carry out the processing are called of software. | 9. colour monitor and printer |
| 10. The ... , intended for use and interpretation by people, is called information. | 10. input |

Exercise 3. Complete the sentences.

1. The computer consists of 2. The size of a computer varies considerably from 3. Over the last decade, computers have become more 4. Like all revolutionary technologies, such as electricity, telephones, and automobiles, computers 5. Computers, although important, are not 6. The computer's speciality is 7. These fundamental operations, conducted in countless combinations at tremendous speed, are 8. A computer is an electronic device that can 9. The computer can thus answer some highly complex questions, although the human being must tell it 10. The output, intended for use and

Exercise 4. Translate into English.

1. Комп'ютер – електронний пристрій, який працює за допомогою програмного забезпечення. 2. Не можливо уявити сьогодинішній світ без комп'ютерів. 3. В даний час комп'ютери стали більш потужними, легшими у використанні і менш дорогими. 4. Ти можеш використовувати комп'ютер для обробки даних і виконання певних операцій з даними. 5. Щоб йти в ногу з

часом необхідно володіти комп'ютерною грамотою. 6. Комп'ютер здійснює основні операції такі як додавання, віднімання, множення і ділення з величезною швидкістю. 7. Мій друг сказав, що комп'ютер зможе дати відповіді на ці дуже складні запитання. 8. Комп'ютери стали необхідними в сьогоdnішньому світі. 9. У минулі десятиліття комп'ютери не мали такої великої кількості застосувань. 10. Ці фундаментальні операції легше і швидше вирішити за допомогою комп'ютера.

Additional Text (for individual work)

Read and translate the text.

A personal computer can be characterized as:

- First, a personal computer being microprocessor-based, its central processing unit, called a microprocessor unit, or MPU, is concentrated on a single silicon chip.
- Second, a PC has a memory and word size that are smaller than those of minicomputers and large computers. Typical word sizes are 8 or 16 bits and main memories range in size from several tens of gigabytes to several terabytes.
- Third, a personal computer uses smaller, less expensive, less powerful input, output and storage components than do large computer systems. Most often, input is by means of keyboard, soft-copy output being displayed on a screen. Hard-copy output is produced on a printer.

A PC employs disks and USB flash drive as the principle online and offline storage devices and also as input and output media.

- Finally, a PC is a general-purpose, stand-alone system that can begin to work when plugged in and be moved from place to place.

Probably the most distinguishing feature of a personal computer is that it is used by an individual, usually in an interactive mode. Eventually the market segments lost any technical distinction; business computers acquired color graphics capacity and sound, and home computers and game systems used the same processors and operating systems as office-bound computers. Even local area networking, originally a way to allow business computers to share expensive mass storage and peripherals, became a standard feature of a home computer.

1. Put questions to the text.

2. Discuss it with your groupmates.

Lesson 3

Read and translate the text:

Computer Science

Computer science means the study of computers, including their design (architecture) and their uses for computations, data processing, and system control. The field of computer science includes engineering activities such as the design of computers and of the hardware and software that make up computer systems. It also encompasses theoretical, mathematical activities, such as the design and

analysis of algorithms, performance studies of systems and their components by means of techniques like queueing theory, and the estimation of the reliability and availability of systems by probabilistic techniques. Since computer systems are often too large and complicated to allow a designer to predict failure or success without testing, experimentation is incorporated into development cycle. Computer science is generally considered a discipline separate from computer engineering, although the two disciplines overlap extensively in the area of computer architecture, which is the design and study of computer systems.

The major subdisciplines of computer science have traditionally been (1) architecture (including all levels of hardware design, as well as the integration of hardware and software components to form computer systems), (2) software (the programs, or sets of instructions that tell a computer how to carry out tasks), here subdivided into software engineering, programming languages, operating systems, information systems and databases, artificial intelligence, and computer graphics, and (3) theory which includes computational methods and numerical analysis on the one hand and data structures and algorithms on the other.

Vocabulary:

Computer science – інформатика,
data processing – обробка даних,
to include – включати, мати на увазі,
engineering activities – інженерна діяльність,
to encompass theoretical and mathematical activities – укладати (мати в собі) теоретичні і математичні дії,
to predict failure and success – передбачати поразку і успіх,
to be incorporated into development cycle – бути впровадженим у цикл розвитку,
to be generally considered as ... – розглядатися в цілому як ...,
queueing theory – теорія черг,
estimation of the reliability – оцінка надійності,
probabilistic techniques – ймовірні методи,
to overlap extensively – частково збігатися,
subdisciplines – додаткові дисципліни,
to subdivide – підрозділяти,
data structures – структури даних,
artificial intelligence – штучний інтелект.

Comprehensive Questions

1. What does computer science mean?
2. What does the field of computer science include?
3. What is the divergence between engineering, theoretical and mathematical activities?
4. What does each separate activity mean?
5. What two disciplines overlap extensively in the area of computer architecture?
6. What sub disciplines of computer science do you know?
7. What does architecture include?

8. What is software?
9. What is software subdivided into?
10. What does theory include?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

The study of computers, to include engineering activities, to make up computer systems, to encompass theoretical and mathematical activities, to predict failure or success, to be generally considered as, to be incorporated into development cycle, to overlap extensively, subdisciplines, to subdivide into software engineering.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|--|--|
| 1. means the study of computers, including their design and their uses for computations, data processing, and system control. | 1. the field of computer science |
| 2. includes the design of computers and of the hardware and software. | 2. theoretical and mathematical activities |
| 3. The field of computer science encompasses | 3. architecture |
| 4. don't allow a designer to predict failure or success without testing. | 4. computer engineering |
| 5. Computer science is generally considered a discipline separate from | 5. computer science |
| 6. The two disciplines overlap extensively in the area of computer architecture, which is ... and ... | 6. computer systems |
| 7. ... includes all levels of hardware design and the integration of hardware and software components. | 7. the design, study of computer systems |
| 8. ... the programs, or sets of instructions that tell a computer how to carry out tasks. | 8. theory |
| 9. ... includes computational methods and numerical analysis on the one hand and data structures and algorithms on the other. | 9. subdiscipline |
| 10. The major of computer science have traditionally been architecture, software and theory. | 10. software |

Exercise 3. Complete the sentences.

1. Computer science means the study of computers, including their design (architecture) and
2. The field of computer science includes engineering activities such as the design of computers and of the hardware and
3. The field of computer science encompasses theoretical, mathematical activities, such as the design and
4. Since computer systems are often too large and complicated to allow a designer to predict failure or success without
- 5.

Computer science is generally considered a discipline 6. The two disciplines overlap extensively in the area of computer architecture 7. The major subdisciplines of computer science have traditionally been 8. Architecture includes all levels of hardware design, as well as 9. Software are the programs, or sets of instructions that tell a computer how to carry out tasks) 10. Theory includes computational methods and numerical analysis on the one hand and

Exercise 4. Translate into English.

1. Він сказав, що його улюблений предмет у коледжі – інформатика. 2. Коли будуть готові результати обробки цих даних? 3. Чи ти знаєш, що складає комп'ютерну систему? 4. Вона не знала, що архітектура, програмне забезпечення і теорія є додатковими дисциплінами інформатики. 5. Як ти думаєш, чи розглядається інформатика, окремо від комп'ютерної інженерії? 6. Комп'ютерні системи є часто занадто великі і складні, щоб дозволити дизайнеру передбачити невдачу чи успіх без перевірки. 7. Чи збігаються частково інформатика комп'ютерна інженерія у сфері комп'ютерної архітектури? 8. Я не знав, що точно включає в себе архітектура. 9. Вона запитала мене, які обчислювальні методи їй краще використати. 10. У мене немає всіх необхідних програм для ефективної роботи комп'ютера.

Lesson 4

Read and translate the text:

Different Types of Computers

A computer is one of the most brilliant inventions of mankind. Thanks to computer technology, we were able to achieve storage and processing of huge amounts of data; we could rest our brains by employing computer memory capacities for storage of information. Owing to computers, we have been able speed up daily work, carry out critical transactions and achieve accuracy and precision at work. Computers of the earlier times were of the size of a large room and were required to consume huge amounts of electric power. However, with the advancing technology, computers have shrunk to the size of a small watch. Depending on the processing power and size of computers, they have been classified under various types. Let us look at the classification of computers.

What are the Different Types of Computers?

Based on the operational principle of computers, they are categorized as analog, digital and hybrid computers.

Operational Principle	
1. Analog	Analog Computers: These are almost extinct today. These are different from a digital computer because an analog computer can perform several mathematical operations simultaneously. It uses continuous variables for mathematical operations and utilizes mechanical or electrical energy.
2. Digital	
3. Hybrid	

Digital Computers: They use digital circuits and are designed to operate on two states, namely bits 0 and 1. They are analogous to states ON and OFF. Data on these computers is represented as a series of 0s and 1s. Digital computers are suitable for complex computation and have higher processing speeds. They are programmable. Digital computers are either general purpose computers or special purpose ones. General purpose computers, as their name suggests, are designed for specific types of data processing while special purpose computers are meant for general use.

Hybrid Computers: These computers are a combination of both digital and analog computers. In this type of computers, the digital segments perform process control by conversion of analog signals to digital ones.

This was the classification of computers based on their style of functioning.

Following is a classification of the different types of computers based on their sizes and processing powers.

Processing Power

1. Mainframe
2. Microcomputers

Mainframe Computers: Large organizations use mainframes for highly critical applications such as bulk data processing and ERP. Most of the mainframe computers have capacities to host multiple operating systems and operate as a number of virtual machines. They can substitute for several small servers.

Microcomputers: A computer with a microprocessor and its central processing unit is known as a microcomputer. They do not occupy space as much as mainframes do. When supplemented with a keyboard and a mouse, microcomputers can be called personal computers. A monitor, a keyboard and other similar input-output devices, computer memory in the form of RAM and a power supply unit come packaged in a microcomputer. These computers can fit on desks or tables and prove to be the best choice for single-user tasks. Personal computers come in different forms such as desktops, laptops and personal digital assistants. Let us look at each of these types of computers.

Personal Computers

1. Desktop
2. Laptop
3. Netbook
4. PDA
5. Minicomputer
6. Server
7. Supercomputer
8. Wearable Computer
9. Tablet

Desktops: A desktop is intended to be used on a single location. The spare parts of a desktop computer are readily available at relatively lower costs. Power consumption is not as critical as that in laptops. Desktops are widely popular for daily use in the workplace and households.

Laptops: Similar in operation to desktops, laptop computers are miniaturized and optimized for mobile use. Laptops run on a single battery or an external

adaptor that charges the computer batteries. They are enabled with an inbuilt keyboard, touch pad acting as a mouse and a liquid crystal display. Their portability and capacity to operate on battery power have proven to be of great help to mobile users.

Netbooks: They fall in the category of laptops, but are inexpensive and relatively smaller in size. They had a smaller feature set and lesser capacities in comparison to regular laptops, at the time they came into the market. But with passing time, netbooks too began featuring almost everything that notebooks had. By the end of

2008, netbooks had begun to overtake notebooks in terms of market share and sales.

Personal Digital Assistants (PDAs): It is a handheld computer and popularly known as a palmtop. It has a touch screen and a memory card for storage of data. PDAs can also be used as portable audio players, web browsers and smartphones. Most of them can access the Internet by means of Bluetooth or Wi-Fi communication.

Minicomputers: In terms of size and processing capacity, minicomputers lie in between mainframes and microcomputers. Minicomputers are also called mid-range systems or workstations. The term began to be popularly used in the 1960s to refer to relatively smaller third generation computers. They took up the space that would be needed for a refrigerator or two and used transistor and core memory technologies. The 12-bit PDP-8 minicomputer of the Digital Equipment Corporation was the first successful minicomputer.

Servers: They are computers designed to provide services to client machines in a computer network. They have larger storage capacities and powerful processors. Running on them are programs that serve client requests and allocate resources like memory and time to client machines. Usually they are very large in size, as they have large processors and many hard drives. They are designed to be fail-safe and resistant to crash.

Supercomputers: The highly calculation-intensive tasks can be effectively performed by means of supercomputers. Quantum physics, mechanics, weather forecasting, molecular theory are best studied by means of supercomputers. Their ability of parallel processing and their well-designed memory hierarchy give the supercomputers, large transaction processing powers.

Wearable Computers: A record-setting step in the evolution of computers was the creation of wearable computers. These computers can be worn on the body and are often used in the study of behavior modeling and human health. Military and health professionals have incorporated wearable computers into their daily routine, as a part of such studies. When the users' hands and sensory organs are engaged in other activities, wearable computers are of great help in tracking human actions. Wearable computers do not have to be turned on and off and remain in operation without user intervention.

Tablet Computers: Tablets are mobile computers that are very handy to use and vary as to their size. They use the touch screen technology. Tablets come with an onscreen keyboard or use a stylus or a digital pen. Apple's iPad redefined the class of tablet computers. These were some of the different types of computers used today.

Looking at the rate of advancement in technology, we can definitely look forward to many more types of computers in the near future.

Vocabulary:

To achieve storage – досягати зберігання,
accuracy and precision – правильність і точність,
to consume – споживати,
shrink to the size – стискуватись у розмірі,

processing power – потужність обробки,
extinct – зниклий,
simultaneously – одночасно,
variables – перемінна, змінна (величина),
circuit – кругообіг, схема,
namely – саме, тобто,
computation – обчислення,
conversion – перетворення, зміна,
bulk data processing – оброблення великої маси даних,
to host – розміщувати, ввести програму,
to substitute – замінювати,
to supplement – доповнювати, укомплектовувати,
consumption – споживання,
to enable – давати змогу,
portability – портативність,
to overtake – доганяти,
a core – ядро, серцевина,
handy – зручний,
to redefine – перевизначити,
to allocate – розміщати, розподіляти,
to incorporate – об'єднувати,
stylus – графічний.

Comprehensive Questions

1. What is one of the most brilliant inventions of mankind?
2. What were the computers of earlier times?
3. How are computers categorized based on the operational principle?
4. How is analog computer different from a digital computer?
5. What do digital computers use and how they operate?
6. What are digital computers?
7. How do hybrid computers work?
8. Name computers which process power?
9. What capacities do most of the mainframe computers have?
10. What computers are known as microcomputers?
11. What are types of personal computers?
12. Where are desktops popular?
13. How are laptops run on?
14. What computers fall in the category of laptops?
15. What computers can be used as portable audio players, web browsers and smartphones?
16. What minicomputer was the first successful minicomputer?
17. Describe the servers.
18. What can be best studied by means of supercomputers?
19. Where are wearable computers used?
20. What computers use touch screen technology?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

Processing of huge amounts of data, speed up daily work, to perform several mathematical operations simultaneously, to be suitable for complex computation, to be supplemented with, similar input-output devices, to be used on a single location, a touch pad, with the passing time, the highly calculation-intensive tasks.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|--|------------------------|
| 1. ... have larger storage capacities and powerful processors. | 1. storage information |
| 2. ... are widely popular for daily use in the workplace and households. | 2. analog computer |
| 3. We could rest our brains by employing computer memory capacities for | 3. digital computers |
| 4. ... are a combination of both digital and analog computers. | 4. hybrid computers |
| 5. ... are miniaturized and optimized for mobile use. | 5. virtual machines |
| 6. ... can perform several mathematical operations simultaneously. | 6. desktops |
| 7. Mainframe computers have capacities to host multiple operating systems and operate as a number of | 7. microcomputers |
| 8. ... are either general purpose computers or special purpose ones. | 8. laptop computers |
| 9. Quantum physics, mechanics, weather forecasting, molecular theory are best studied by means of | 9. servers |
| 10. ... can fit on desks or tables and prove to be the best choice for single-user tasks. | 10. supercomputers |

Exercise 3. Tell what sentences are true, what are false.

1. Owing to computers, we have been able slow down daily work, don't carry out critical transactions and achieve accuracy and precision at work.
2. Computers of the earlier times were of the small size and weren't required to consume huge amounts of electric power.
3. Analog computers are of great use today.
4. Digital computers use digital circuits and are designed to operate on two states, namely bits 0 and 1.
5. Digital computers are either general purpose computers or special purpose ones.
6. Hybrid computers are a combination of both general purpose and special purpose computers.
7. Most of the microcomputers have capacities to host multiple operating systems and operate as a number of virtual machines.
8. A computer with a microprocessor and its central processing unit is known as a microcomputer.
9. Desktops are widely popular for daily use in the workplace and households.

10. Similar in operation to desktops, laptop computers are miniaturized and optimized for home use.
11. With passing time, netbooks feature almost everything that notebooks had.
12. Netbook has a touch screen and a memory card for storage of data.
13. Minicomputers have larger storage capacities and powerful processors.
14. Servers are very small in size, but they have large processors and many hard drives.
15. Quantum physics, mechanics, weather forecasting, molecular theory are best studied by means of supercomputers.
16. Wearable computers have to be turned on and off and remain in operation with user intervention.
17. Tablets come with an onscreen keyboard or use a stylus or a digital pen.

Exercise 4. Complete the sentences.

1. Owing to computers, we have been able
2. Based on the operational principle of computers, they are categorized as
3. Analog computer uses continuous variables for mathematical operations and
4. General purpose computers, as their name suggests, are designed for specific types of data processing while general purpose computers
5. Laptops run on a single battery or an external adapter that
6. Most of Personal Digital Assistants (PDAs) can access the Internet by
7. Servers are computers designed to
8. The highly calculation-intensive tasks can be effectively performed by
9. Wearable computers can be worn on the body and are often used in
10. Tablet computers use the

Exercise 5. Translate into English.

1. Комп'ютер – один з найблисучіших винаходів людства.
2. Маючи комп'ютери, ми можемо пришвидшити щоденну роботу та досягти правильності і точності у роботі.
3. Мій друг сказав, що він може одночасно виконувати декілька фундаментальних операцій на комп'ютері.
4. Аналогові комп'ютери майже зникли сьогодні.
5. Мікрокомп'ютери не займають так багато місця як основні комп'ютери.
6. Цей нетбук дуже зручний у користуванні, тому що він має всі функції ноутбуку.
7. Персональні цифрові помічники мають сенсорний екран і карту пам'яті для збереження даних. Вони можуть використовуватись як портативні аудіоплеєри, веббраузери і смартфони.
8. Я не знав, що переносні комп'ютери часто допомагають у відслідковуванні людських дій.
9. Квантова фізика, механіка, молекулярна теорія і прогноз погоди найкраще вивчаються за допомогою суперкомп'ютерів.
10. Сьогодні є багато типів персональних комп'ютерів, які є зручними і корисними у використанні.

Lesson 5

Read and translate the text:

Several Uses of Computers

There are several uses of computers:

- **Word Processing** - Word Processing software automatically corrects spelling and grammar mistakes. If the content of a document repeats you don't have to type it each time. You can use the copy and paste features. You can printout documents and make several copies. It is easier to read a word-processed document than a handwritten one. You can add images to your document.
- **Internet** - It is a network of almost all the computers in the world. You can browse through much more information than you could do in a library. That is because computers can store enormous amounts of information. You also have very fast and convenient access to information. Through E-Mail you can communicate with a person sitting thousands of miles away in seconds. There is chat software that enables one to chat with another person on a real-time basis. Video conferencing tools are becoming readily available to the common man.
- **Digital video or audio composition** - Audio or video composition and editing have been made much easier by computers. It no longer costs thousands of dollars of equipment to compose music or make a film. Graphics engineers can use computers to generate short or full-length films or even to create three-dimensional models. Anybody owning a computer can now enter the field of media production. Special effects in science fiction and action movies are created using computers.
- **Desktop publishing** - With desktop publishing, you can create page layouts for entire books on your personal computer.
- **Computers in Medicine** - You can diagnose diseases. You can learn the cures. Software is used in magnetic resonance imaging to examine the internal organs of the human body. Software is used for performing surgery. Computers are used to store patient data.
- **Mathematical Calculations** - Thanks to computers, which have computing speeds of over a million calculations per second we can perform the biggest of mathematical calculations.
- **Banks** - All financial transactions are done by computer software. They provide security, speed and convenience.
- **Travel** - One can book air tickets or railway tickets and make hotel reservations online.
- **Telecommunications** - Software is widely used here. Also all mobile phones have software embedded in them.
- **Defense** - There is software embedded in almost every weapon. Software is used for controlling the flight and targeting in ballistic missiles. Software is used to control access to atomic bombs.

- **E-Learning** - Instead of a book it is easier to learn from an E-learning software.
- **Gambling** - You can gamble online instead of going to a casino.
- **Examinations** - You can give online exams and get instant results. You can check your examination results online.
- **Computers in Business** - Shops and supermarkets use software which calculate the bills. Taxes can be calculated and paid online. Accounting is done using computers. One can predict future trends of business using artificial intelligence software. Software is used in major stock markets. One can do trading online. There are fully automated factories running on software.
- **Certificates** - Different types of certificates can be generated. It is very easy to create and change layouts.
- **ATM machines** - The computer software authenticates the user and dispenses cash.
- **Marriage** - There are matrimonial sites through which one can search for a suitable groom or bride.
- **News** - There are many websites through which you can read the latest or old news.
- **Classmates** - There are many alumni websites through which you can regain contact with your classmates.
- **Robotics** - Robots are controlled by software.
- **Washing Machines** - They operate using software.
- **Microwave Oven** - They are operated by software.
- **Planning and Scheduling** - Software can be used to store contact information, generating plans, scheduling appointments and deadlines.
- **Plagiarism** - Software can examine content for plagiarism.
- **Greeting Cards** - You can send and receive greetings pertaining to different occasions.
- **Sports** - Software is used for making umpiring decisions. There are simulation software using which a sportsperson can practice his skills. Computers are also used to identify flaws in technique.
- **Airplanes** - Pilots train on software, which simulates flying.
- **Weather analysis** - Supercomputers are used to analyze and predict weather.

Vocabulary:

Word Processing – робота у «ворді»,

to paste features – склеювати зображення,

to browse through information – проглядати інформацію,

to chat – спілкуватися,

readily – охоче,

editing – видання,

to generate – створювати,

dimensional – тривимірний,

science fiction – наукова фантастика,

action movie – бойовик,
 layout – проект, план,
 to diagnose diseases – встановлювати захворювання,
 to perform surgery – виконувати хірургічні операції,
 to provide security – забезпечувати безпеку,
 to embed – вставляти, вмонтовувати,
 to gamble – грати в азартні ігри,
 to authenticate – встановлювати достовірність,
 to dispense cash – видавати готівку,
 matrimonial – подружній,
 alumni – випускник,
 to regain contacts – відновлювати контакти,
 deadline – крайній строк,
 to pertain to – стосуватися когось,
 simulation – імітація, відтворення,
 umpiring decisions – судові рішення.

Comprehensive Questions

1. What can you do by the word-processing?
2. What can give a fast and convenient access to information?
3. Is it cheaper to make films and compose music using a computer?
4. How are computers used in medicine?
5. Can computers perform the biggest calculations per seconds?
6. What do computers do in banks?
7. How is software used in defense?
8. Is it easier to learn from E-learning software?
9. How do we use computers in business?
10. Where can we else use software?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

A word-processed document, a handwritten one, a network, to store enormous amounts of information, fast and convenient access to information, to store patient data, to provide security, to make hotel reservation online, alumni website, to identify flaws in technique.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|---|----------------------|
| 1. Anybody owning a computer | 1. E-mail |
| can now enter the field of | 2. software |
| 2. You can ... online instead of | 3. word-processing |
| going to a casino. | 4. accounting |
| 3. software automatically | 5. media-production |
| corrects spelling and grammar mistakes. | 6. matrimonial sites |
| 4. ... is done using computers. | 7. gamble |

5. Through ... you can communicate with a person sitting thousands of miles away in seconds.
6. There are many ... through which you can regain contact with your classmates.
7. ... are used to analyze and predict weather.
8. There are ... through which one can search for a suitable groom or bride.
9. There are ... using which a sportsperson can practice his skills.
10. ... is used for performing surgery.

8. supercomputers
9. simulation software
10. alumni websites

Exercise 3. Tell what sentences are true, what are false.

1. Word Processing software automatically corrects spelling and grammar mistakes. 2. It is difficult to read a word-processed document than a handwritten one. 3. There is chat hardware that enables one to chat with another person on a real-time basis. 4. It is very expensive to pay for an equipment to compose music or make a film. 5. Software is used in magnetic resonance imaging to examine the internal organs of the human body. 6. Anybody owning a computer can now make medical diagnoses. 7. It is forbidden to do trading online. 8. There are no automated factories running on software. 9. The computer software authenticates the user and dispense cash. 10. Digital computers are used to analyze and predict weather.

Exercise 4. Complete the sentences.

1. If the content of a document repeats you don't have 2. Software is used in magnetic resonance imaging to examine 3. Instead of a book it is easier to learn from 4. One can predict future trends of business using 5. There are many alumni websites through which you can regain 6. Washing machines and microwave oven operate using 7. Software can examine content for 8. You can send and receive greetings pertaining 9. Computers are also used to identify flaws 10. There are matrimonial sites through which one can search for

Exercise 5. Translate into English.

1. Яке програмне забезпечення автоматично виправляє помилки? 2. Ти можеш проглядати багато вебсайтів і прочитати найостанніші новини використовуючи Інтернет. 3. Ти знаєш, що всі спецефекти в науковій фантастиці і бойовиках створюються за допомогою комп'ютерів. 4. Програмне забезпечення, яке використовується в медицині, допомагає встановлювати діагнози захворювань. 5. Відомо, що всі фінансові операції виконуються за допомогою комп'ютерів. 6. Щоб відновити контакти із своїми однокласниками, ти можеш скористатися вебсайтом випускників. 7. Комп'ютерне програмне забезпечення допомагає встановлювати достовірність користувача і видавати готівку. 8. Комп'ютери широко

використовуються в бізнесі. 9. Ви можете замовляти квитки на літак чи на потяг і забронювати готель через Інтернет. 10. Цей студент сказав, що йому легше навчатися за допомогою електронного програмного забезпечення.

Additional Text (for individual work)

Read and translate the text.

Computers in Education

Computers are used in education in the following technologies: CD-ROM, interactive video, computer-assisted learning, multimedia, distance learning (where students and their tutor connect their computers via modem and telephone lines), etc.

Computers could be used to teach such courses as programming, writing, mathematics, languages, etc. there may be computers available for students to use on their own, in the library or in a media center. Many libraries have computerized catalogues.

The term “educational technology” covers many areas, including the use of computers and interactive video in education.

The word CALL stands for Computer Assisted Language Learning. CALL has certain advantages and disadvantages as a way of learning foreign languages. Its main advantages are the following: software often provides instant feedback, students can learn at their own place, students can control their own progress, computers don't get tired, content can be customized to suit particular needs' gaining computer literacy is a desirable skill in today's world.

CALL's main disadvantages: the training can be impersonal, some students (and teachers) have difficulty adapting to machines, and computers cannot answer all the student's questions.

Is it possible that one day language teachers will be completely replaced by computers?

The answer is **NO** because computers are unlikely to be able to provide the same instructions as a human being can in terms of variety of responses, feedback on points that are not included in the software package, etc. A teacher will probably know more about language and how it is used than the programmed software available for computers. Teachers can intervene at any time to help students with any problem, no matter when it comes up.

Most educational software fails because it cannot easily adapt to the pace of the student and cannot adequately interact with the student in the way that a teacher can. If you could make educational software as absorbing as games software and teach at the same time, this would be ideal.

- 1. Divide the text into the logical parts and give a title to each.**
- 2. Put questions to the text.**

Lesson 6

Read and translate the text:

Importance of Computers in Daily Life

When talking about the use of computers in daily life, we talk about the direct as well as indirect uses. Then we use the computer for working or gaming, we have its direct uses; while using an ATM, we are actually making an indirect use of computer based technology. The Internet proved to be a boon in the field of science and technology. Computers, in general, are used in nearly all fields today, like supermarkets, banks, etc. Here are some of the common uses of computers which may help in realizing the role of computers in daily life.

Education

With the development of technology, we find that long gone are the days when we used notebooks to write down our research paper or actually used the library for research. Today, you simply need to 'Google' to find any information you want. Secondly, e-learning (e-classrooms) or distance learning with computers is the latest and most practical mode of education today. Right from encyclopedias to dictionaries to tests; you can simply have anything on your own PC within a fraction of seconds.

Accounts

Do you remember the last time you actually did maths using a pencil and paper, or even calculated your monthly expense using a calculator? This is because most of us use computers for our daily accounts. Keeping accounts using computers is not only feasible, but also more reliable and safer. You can have passwords and also memory devices that can preserve large data for a really long time.

Data Storage

Talking about data storage, most of us have an enviable collection of music, movies, etc. on our PC. Storing and sharing of any kind of data is very easy and practical on computers. Secondly, storage options like the network-attached storage help in providing data access to a larger number of clients.

Working

Large number of people make use of computers for work purposes every day. Software engineers, writers, businessmen, employees in the fields of telecommunication, banking, research, medicine make use of computers daily. Secondly, telework or working from home is possible because of the PC. Therefore, we can say that the computer is also a source of income for a considerable number of people all over the world.

Social Networking and Gaming

Last, very few of us would actually spend a day without Facebook or Twitter. If you take a look at the rise of followers or users on these or any other

social networking sites, you will have a fair idea about their popularity and role in social interaction. Secondly, do you know that the computer gaming industry generates billions in revenue every year? This is because of the popularity of computer games all over the world.

Some More Uses of Computers in Daily Life

The above mentioned are the major fields that highlight the role of computers in daily life. Apart from the aforementioned ones, there are several other uses of computers in day-to-day life. They include:

- E-banking
- E-shopping
- Graphics and architectural designs
- Sharing of knowledge
- Entertainment
- Day planners / organizers
- Writing / publishing content

You can also go through the link on [how has computer technology affected our lives](#). Lastly, as a part of fun, imagine one day without using your PC or any computer based application. Then, you will surely understand the importance of this 'thinking machine' in your life.

Vocabulary:

To be a boon – бути благом, зручністю,
ATM (Automatic Teller Machine) – банкомат,
to realize a role – усвідомити роль, значення,
a fraction – частинка,
actually – фактично, насправді,
to keep accounts – вести розрахунки,
feasible – можливий, ймовірний,
an enviable collection – завидна колекція,
to share data – розподіляти дані,
a source of income – джерело прибутку,
the network-attached storage – зберігання в мережі,
a follower – прихильник,
to have a fair idea – мати чітке уявлення,
social interaction – соціальна взаємодія,
to generate – породжувати,
in revenue – в дохід,
to highlight – надавати великого значення,
aforementioned – вищезгаданий,
apart from – крім,
a based application – основне використання.

Comprehensive Questions

1. What are direct uses of the computer?
2. What is indirect use of the computer based technology?
3. What do we need to find any information?
4. Are computers used in nearly all fields today?
5. Can we keep accounts using a computer?
6. What helps to provide data access to a large number of clients?
7. What do large number of people make use of computers for?
8. Why does the computer gaming industry generate billions in revenue every year?
9. What are other uses of computers in day-to-day life?
10. Can you imagine one day without PC?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

Direct and indirect uses, computer based technology, the role of computers, the development of technology, distance learning, more reliable and safer, a password, data storage, to preserve large data, providing data access, software engineers, a source of income, gaming industry, “thinking machine”.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|---|------------------------------|
| 1. When we use the computer for we have its direct uses. | 1. Google |
| 2. The Internet proved in the field of science and technology. | 2. data access |
| 3. Today, you simply need to ... to find any information. | 3. e-learning |
| 4. You can have ... and that can preserve data for a really long time. | 4. working or gaming |
| 5. of any kind of data is very easy and practical on computers. | 5. a source of income |
| 6. Storage options like the network-attached storage help in providing to a large number of clients. | 6. passwords, memory devices |
| 7. ... is the most practical mode of education today. | 7. computer |
| 8. The computer is for a considerable number of people all over the world. | 8. to generate |
| 9. The computer gaming industry ... billions in revenue every year. | 9. to be a boon |
| 10. Large number of people make use of ... for work purposes every day. | 10. storing and sharing |

Exercise 3. Complete the sentences.

1. When we use the computer for working or gaming, we have its 2. The Internet proved to be a boon in the field of 3. E-learning (e-classrooms) or distance learning with computers is the latest and most practical mode of 4. You simply need to 'Google' to 5. Keeping accounts using computers is not only feasible, but 6. Storing and sharing of any kind of data is very 7. The network-attached storage help in providing 8. We can say that the computer is also a source of 9. Large number of people make use of computers for 10. The computer gaming industry generates billions in revenue every year because of

Exercise 4. Translate into English.

1. Комп'ютери використовуються майже в усіх галузях науки і технології сьогодні. 2. Інтернет може допомогти усвідомити роль комп'ютерів у сьогоденному житті. 3. Якщо вам необхідно знайти будь-яку інформацію, ви можете просто використати «Гугл». 4. Ти можеш мати будь-що на своєму комп'ютері за частину секунди. 5. Електронне чи дистанційне навчання за допомогою комп'ютерів є найостаннішим і найпрактичнішим методом освіти сьогодні. 6. Давно пройшли дні, коли ми використовували блокноти, щоб записувати дослідження чи проводили обчислення за допомогою калькулятора. 7. Комп'ютери є більш надійними і безпечними запам'ятовувальними пристроями, які зберігають багато даних протягом довгого часу. 8. Зберігати і розподіляти будь-якого виду дані дуже легко і практично на комп'ютері. 9. Комп'ютер є джерелом прибутку для значної кількості людей по всьому світі. 10. Дуже мало людей можуть провести день без Інтернету чи Фейсбуку.

Lesson 7

Read and translate the text:

The Harmful Influence of the Computer

Is computer work so harmless and safe? It is interesting to find that it was categorized as one of the 40 most health damaging jobs. It is impossible to avoid the computerization process of an entire country.

Computers are nowadays used everywhere: in schools, at home, in companies, institutions and so on.



Ads by Google

One of the bad aspects of computer use is that even the children who cannot read and write yet, are already used to this machine. They develop at a very early age the habit of playing on the computers for hours on end.

According to the latest researches, computers do not improve our health and they can seriously damage our system when they are not properly used.

There certainly is a quite sharp competition in the computer world. Due to this aspect, several different opinions have been developed on this topic. Computer producers assert that computers are absolutely unharmed. At that time protection remedies producers had different opinions.

The work done by a computer operator is generally quite exhausting and intensive. For instance, Germans include this type of work among the 40 most health damaging jobs. It is considered that working on the computer should not exceed 50% of the working period.

When we work at the monitor, we need to read, type, analyze something, correct mistakes, and perhaps do all that more than once. Yet in exchange, the eyes have to try adjusting to all that pressure, and for this reason, we may assert that the computer really does have a negative impact on our eyesight.

Even the celebrated multi-millionaire Microsoft manager, Bill Gates, has severely deteriorated his eyesight because of the computer use. People for whom computer work is their “bread and butter” have the most health complaints because of muscle and joint diseases. This might be restricted to neck torpor, pain in the shoulders and in the loins, etc. However, there can be more grievous problems such as the carpal tunnel syndrome, which refers to the damage of arm nerves due to the excessive time spent working on the computer.

All this bad effect of the computer on our eyes can be found under the name of CVS (Computer Vision Syndrome), which includes dryness of the eyes, eyestrain, backache, neck ache, wrist ache, reduced acuity of vision, distress, reduced capacity of concentration and so on.

Those who need to spend a lot of time in front of a computer encounter two main problems: the excess of information and the electromagnetic fields.

Because of that, specialists like computer programmers and engineers are often under a high level of mental pressure, which may lead to anxiety, lack in energy, emotional instability, inefficiency in completing the required work.

Another damage brought about by computer work is the unavoidable exposure to the so-called electromagnetic fields. Contrary to some people's opinion, they do affect the biological processes of our body, which can be even more sensitive to weak electromagnetic fields than to strong electromagnetic fields.

In fact, some persons who do not react in any way to strong electromagnetic fields might feel certain dizziness because of exposure to weak electromagnetic fields. That is because those low intensity magnetic fields reduce the intensity of blood pressure. For that reason, we are very likely to sense a decrease in our body temperature after over-using the computer.

Of course, we may find several solutions to avoid or prevent these bad influences of working on the computer. For instance, we could start with an easier project and leave the difficult one until later, when we feel more able to do it. If not, we might simply turn to simple activities, in order to turn our attention from the disturbing aspects of information overload.

Vocabulary:

Harmful influence – шкідливий вплив,
to categorize – розподіляти за категоріями,
harmless – нешкідливий, безпечний,
to assert – стверджувати,
remedy – засіб, ліки,
exhausting – виснажливий,
intensive – напружений,
to exceed – перевищувати,
to have a negative impact – мати негативний вплив,
celebrated – знаменитий,
severely deteriorated – сильно погіршений,
muscle and joint diseases – захворювання м'язів і суглобів,
to restrict – обмежувати,
torpor – онімілість, заціпеніння,
loin – попереk,
grievous problems – тяжкі, жахливі проблеми,
carpal tunnel syndrome – кистьовий (зап'ястний синдром),
excessive time – надмірний час,
eyestrain – перевтома очей,
acuity of vision – гострота зору,
distress – виснаження;
excess of information – надлишок інформації;
anxiety – тривога,
unavoidable exposure – неминучий ризик,
intensity – інтенсивність.

Comprehensive Questions

1. What was categorized as one of the 40 most health damaging jobs?
2. Where are computers used nowadays?
3. What is one of the bad aspects of computer use?

4. What habit do children develop at a very early age?
5. What different opinions have computer producers and protection remedies producers?
6. What is the work done by a computer operator?
7. What do we need to do when we work at the monitor?
8. Does the computer have a negative impact on our eyesight?
9. What complaints have people for whom computer work is their bread and butter?
10. What does CVS (Computer Vision Syndrome) include?
11. To what does a high level of mental pressure lead?
12. How do electromagnetic fields affect the people?
13. What can we do to avoid or prevent these bad influences of working on the computer?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

Health damaging jobs, for hours on end, unarmful, protection remedies producers, exhausting and intensive, a negative impact on the eyesight, celebrated multi-millionaire, muscle and joint diseases, to reduce acuity of vision, capacity of concentration, a high level of mental pressure, damage.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|---|---|
| 1. It is impossible to avoid of an entire country. | 1. over-using the computer |
| 2. Computer was categorized as being one of the 40 | 2. seriously damage |
| 3. The children develop at a very early age ... of playing on the computers. | 3. negative impact |
| 4. The work done by a computer operator is quite | 4. the habit |
| 5. Computer really have a on our eyesight. | 5. health damaging jobs |
| 6. Computers can our system when they are not properly used. | 6. unarmful |
| 7. Computer producers assert that computers are absolutely | 7. the unavoidable exposure |
| 8. Another damage brought about by computer work is to the so-called electromagnetic fields. | 8. computerization process |
| 9. Those who need to spend a lot of time in front of a computer encount 2 main problems: | 9. exhausting and intensive |
| 10. We are very likely to sense a decrease in our body temperature after | 10. the excess of information and electromagnetic fields. |

Exercise 3. Tell what sentences are true, what are false.

1. The computer work is harmless and safe. 2. It is possible to avoid the computerization process of an entire country. 3. Computers are nowadays used everywhere: in schools, at home, in companies, institutions and so on. 4. The children who cannot read and write yet are not already used to this machine. 5. Computers improve our health and they can't seriously damage our system when they are not properly used. 6. Computer remedies producers assert that computers are absolutely unharmed. 7. The work done by a computer operator isn't generally quite exhausting and intensive. 8. It is considered that working on the computer may exceed 50% of the working period. 9. The computer really doesn't have a negative impact on our eyesight. 10. People for whom computer work is their "bread and butter" have the most health complaints because of muscle and joint diseases. 11. CVS (Computer Vision Syndrome) includes dryness of the eyes, eyestrain, backache, neck ache, wrist ache, reduced acuity of vision, distress, reduced capacity of concentration and so on. 12. The teachers are often under a high level of mental pressure, which may lead to anxiety, lack in energy, emotional instability, inefficiency in completing the required work. 13. Some persons who do not react in any way to strong electromagnetic fields might feel certain dizziness because of exposure to weak electromagnetic fields.

Exercise 4. Translate into English.

1. Я впевнений, що комп'ютер має негативний вплив на здоров'я людини. 2. Дивно, що діти, які не вміють читати і писати вже звикли безкінечно грати на комп'ютері. 3. Багато людей мають скарги на здоров'я через захворювання м'язів і суглобів. 4. Виробники комп'ютерів заявляють, що комп'ютери не шкідливі для нашого здоров'я. 5. Робота на комп'ютері не повинна перевищувати 50% робочого дня. 6. Коли ми працюємо за монітором, ми друкуємо, аналізуємо щось, виправляємо помилки і робимо це не один раз. 7. Комп'ютери сьогодні використовуються скрізь: в школах, вдома, в установах, інститутах і т.д. 8. Після надмірного використання комп'ютера ми відчуваємо зниження температури тіла. 9. Програмісти і інженери часто знаходяться у стані високої розумової напруги, що може призвести до тривоги, браку енергії, емоційної нестабільності і т.д. 10. Я не знав, що багато відомих людей мають серйозні проблеми із зором через надмірне використання комп'ютера.

Lesson 8**Read and translate the text:****Main Parts of Computers**

A computer is a complex machine that is capable of performing huge computations at an extraordinary speed. Its processing power is often compared to that of a human brain. Although, human intellect is the undoubted winner in this

competition, the capabilities of a computer cannot be underestimated. So, let's take a look at the important parts of a computer.

Central Processing Unit (CPU): Also known as the computer processor, the CPU is an electronic circuit that executes computer programs. The primary responsibility of a computer processor is to execute a sequential set of instructions that constitute a program. CPU operation can be divided into four basic steps, namely, fetch, decode, execute and writeback. During the 'fetch' step, the processor retrieves program instructions from memory. In the decode step, the instruction is broken down into parts. The instruction set architecture of the CPU defines the way in which an instruction is decoded. In the 'execute' step, CPU performs the operation implied by the program instruction. During the 'writeback' step, the CPU writes back the results of execution, to the computer's memory.

Motherboard: A computer motherboard consists of sockets in which microprocessors are installed, memory slots, a chipset that acts as an interface between the CPU bus and the peripheral buses, non-volatile memory chips housing the system's firmware and a clock generator, which helps in the synchronization of various system components. Some motherboards also include logic and connectors to support input devices like PS/2 connectors for a mouse and keyboard.

Hard Disk: A hard disk is described as a part of the computer disk drive, which stores data and provides computer users with quick access to large amounts of data. A hard disk is an electromagnetically charged surface or set of disks that record data in concentric circles known as tracks. It is a non-volatile storage device that stores digitally encoded data. A head, resembling a phonograph arm, is used to read and write data onto a hard disk. The hard disks of [desktops](#) are generally capable of storing 120 GB to 6 TB of data. [Laptop](#) hard disk drivers are smaller and have lower [data storage](#) capacities.

Computer Memory: It refers to those components of a computer, which retain digital data. It forms the core of a computer and makes up the basic computer model in collaboration with the CPU. Magnetic drums and delay lines used as primary storage by computers of the early days, have metamorphosed into a miniature silicon chip, which can achieve efficient storage of large volumes of data. Random Access Memory, popularly known as RAM, is a small-sized light and volatile form of computer memory. It is capable of temporary storage of data. Registers located in a computer processor are the fastest forms of computer storage. The most frequently used information is duplicated in the processor cache of a computer, thereby improving its performance. Computers require a non-volatile primary storage to read large programs. This non-volatile memory is known as ROM or Read-only memory. It also contains the startup programs used for bootstrapping a computer. Secondary storage media such as flash memory, magnetic tape, punch cards and zip drives and tertiary storage media like tape libraries are also a part of computer memory.

Monitor: A visual display unit, as it is called, is an electrical equipment that displays images generated by the video output of a computer. Monitors of the early years used CRT technology for imaging, while modern computer monitors use LCD or plasma screens. The display provides computer users with an instant

feedback in the form of text and graphic images. Monitors are the most-used output devices of a computer.

Keyboard: A keyboard is regarded as an input device for a computer. With respect to the arrangement of keys, a computer keyboard is similar to a typewriter. The keys or buttons act as electronic switches or mechanical levers with characters printed on them, with each keypress corresponding to a written symbol. A keyboard has its own processor and circuitry, which consists of a key matrix, which helps bring about the keyboard operation.

Mouse: A computer mouse is a pointing device that detects two-dimensional motion. It was introduced by Apple Macintosh in 1984. A mouse translates the motion of your hand into signals that a computer can recognize and respond to. There are three basic types of mice, namely, mechanical, optomechanical and optical. Mechanical mice have a rubber or metal ball that can roll in all directions. Mechanical sensors in the mouse detect the direction of motion of the ball. Optomechanical mice differ from mechanical mice, in that they use optical sensors to detect motion. Optical mice, popularly used today, have a laser to detect movement of the mouse. They do not have mechanical moving parts and possess higher performance speeds.

Perhaps the most important part of a computer is the 'intelligence' embedded in it. Can its computing capabilities beat human intellect? Will computers be able to replace human beings? Although, nothing can be said right now, we must not forget that human intelligence is God's creation, while computers are the brainchild of a human.

Vocabulary:

Capable – здатний, здібний,

to underestimate – недооцінювати,

circuit – ланцюг, схема,

a sequential set of instructions – наступний ряд інструкцій,

to fetch – завантажувати,

to decode – розшифровувати,

to imply – визначати,

to writeback – записувати повторно, зворотньо,

motherboard – материнська плата,

socket – сокет,

slot – слот,

volatile form – непостійна форма,

synchronization of system components – зберігання в часі системних компонентів,

concentric circle – концентричне коло,

to resemble – бути подібним, нагадувати,

to retain digital data – зберігати цифрові дані,

to refer to – відноситись до,

collaboration – співпраця,

delay lines – уповільнюючі лінії,

a register – реєстр, офіційний список, журнал,

to duplicate – дублювати,
thereby – внаслідок цього, у зв'язку з цим,
punch card – перфокарта,
bootstrapping a computer – початкове завантаження комп'ютера,
zip – потужний,
tertiary storage media – третинні зберігаючі засоби,
arrangement of keys – розташування кнопок,
mechanical levers – механічні важелі,
a pointing device – вказуючий напрям пристрій,
to possess – володіти,
to embed – встановлювати, вмонтовувати,
a brainchild – творіння.

Comprehensive Questions

1. What is computer's processing power often compared with?
2. What is CPU (Central Processing Unit)?
3. What is the primary responsibility of a computer processor?
4. What four basic steps of CPU operation do you know?
5. What does a computer motherboard consist of?
6. What is a hard disk?
7. What forms the core of a computer?
8. What is RAM (Random Access Memory)?
9. What are the fastest forms of computer storage?
10. What is ROM (Read-only memory)?
11. What is a monitor?
12. What are the most-used output devices of a computer?
13. What is a keyboard?
14. What is a mouse?
15. When was a computer mouse introduced?
16. What is the main function of a mouse?
17. How many basic types of mice do you know?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

Надзвичайна швидкість, можливості комп'ютера, обчислююча потужність, основне завдання, відновлювати інструкції програми, етап розшифрування, комп'ютерна пам'ять, зберігати цифрові дані, програми запуску, для початкового завантаження комп'ютера, пристрій візуального відображення, зворотній зв'язок, вивідний пристрій комп'ютера, розглядатися як, клавіші чи кнопки, двохвимірний рух, бути представленим, котитися у всі напрямки, володіти вищою швидкістю роботи, бути вбудованим в, замінити людей, творіння людини.

Exercise 2. Choose the necessary word and put it in the sentence.

1. A computer is ... that performs
1. the computer memory

huge computations at an extraordinary speed.

2. The Central Processing Unit is that executes computer programs.

3. Some ... include logic and connectors to support input devices like PS/2 connectors for a mouse and keyboard.

4. is a part of the computer disk drive, which stores data and provides computer users with quick access to large amounts of data.

5. forms the core of a computer and makes up the basic computer model in collaboration with the CPU.

6. ROM contains used for bootstrapping a computer.

7. ... is an electrical equipment that displays images generated by the video output of a computer.

8. A keyboard is for a computer.

9. A computer mouse is that detects two-dimensional motion.

10. Optical mice have ... to detect movement of the mouse.

2. monitor

3. the startup programs

4. an electronic circuit

5. a complex machine

6. a laser

7. motherboards

8. a pointing device

9. a hard disk

10. an input device

Exercise 3. Complete the sentences.

1. The CPU is an electronic circuit that 2. CPU operation can be divided into, namely, fetch, decode, execute and writeback. 3. Some motherboards also include logic and connectors to support input devices like PS/2 connectors for 4. A hard disk is described as a part of the computer disk drive, which stores data and provides computer users with 5. a non-volatile storage device that stores digitally encoded data. 6. ... is a small-sized light and volatile form of computer memory. 7. Computers require a non-volatile primary storage to read large programs. This non-volatile memory is known as 8. ... provides computer users with an instant feedback in the form of text and graphic images. 9. A keyboard has its own processor and circuitry, which consists of, which helps bring about the keyboard operation. 10. ... translates the motion of your hand into signals that a computer can recognize and respond to.

Exercise 4. Tell what sentences are true, what are false.

1. A computer processing power is often compared to that of a human brain. 2. The CPU is an electronic circuit that contains the startup programs. 3. CPU operation can be divided into five basic steps, namely, fetch, decode, execute, writeback and store. 4. A computer motherboard also consists of volatile memory chips housing the system's firmware. 5. A hard disk is an electromagnetically charged surface or set of disks that record data in concentric circles known as tracks. 6. Laptop hard disk drives are smaller and have lower data storage capacities than desktops' hard disk drives . 7. RAM is a small-sized light and non-volatile form of computer

memory. 8. Monitors are the most-used output devices of a computer. 9. A computer keyboard is similar to a typewriter. 10. A computer mouse is a pointing device which was introduced by Apple Macintosh in 1974.

Exercise 5. Translate into English.

1. Як ти думаєш, чи може комп'ютер виконувати величезні обчислення надзвичайно швидко? 2. Центральний процесор виконує наступний ряд інструкцій, які складають програму. 3. Драйвери жорстких дисків ноутбуків є меншими ніж у настільних комп'ютерів і мають нижчий потенціал зберігання даних. 4. Комп'ютерна пам'ять є компонентом комп'ютера, яка швидко зберігає цифрові дані. 5. Комп'ютерна пам'ять здатна тимчасово зберігати введені дані. 6. Він не знав, що клавіатура комп'ютера подібна до друкарської машинки. 7. Які миші широко використовуються сьогодні: механічні, оптикомеханічні чи оптичні? 8. Яка є найважливіша частина комп'ютера? 9. Які ввідні пристрої комп'ютера ви знаєте? 10. В наш час найбільш популярними є плазмові екрани.

Additional Text (for individual work)

Read and translate the text.

“Cache” Memories

“Cache” memories are increasingly common (“cashe” – a hiding place for provisions, treasures etc.”). “Cache” memories are essentially hidden from the applications programmer; the cashe belongs to the computer hardware and its controlling operating system. Currently, a typical cache memory would be up to 256 KB in size. The cache may form a part of the circuitry of the CPU chip itself, or may be a separate chip. Either way, the system will be designed so that information in the cache can be accessed much more quickly than information in main storage.

The OS and CPU hardware arrange to copy blocks of bytes (“pages”) from main memory into the cache. The selected pages could be those with the instructions currently being executed. Most programs involve loops where particular sets of instructions are executed repeatedly. If the instructions forming a loop are in the cache, the CPU’s instruction-fetch operation is greatly speeded up. Sometimes it is worth copying pages with data from main memory to the cache – then subsequent data accesses are faster (through data that get changed do have to be copied back to main memory eventually). The operations shifting pages or individual data elements between cache and memory are entirely the concern of the CPU hardware and the operating system. The only way that a programmer should be able to detect a cache is by noticing increased system’s performance.

All data manipulated by computers are represented by bit patterns. A byte, with 8 individual bits, can represent any of 256 different patterns.

1. Put questions to the text.

2. Discuss it with your groupmates.

Lesson 9

Read and translate the text:

Storing Information

In contrast to memory, storage provides a place to store data and programs before and after processing. Disks have become the most widely used medium for the storage part of the system. A disk is a circular platter on which a recording surface has been applied.

The most common type of disk is magnetic. It is coated with the same material found on audiotape, and it can be erased and used over and over. Another type, the optical disk, uses laser beams of light instead of the magnetic method to record and retrieve information.

There are two types of magnetic disks: floppy disks and hard disks.

Floppy disks were made from thin sheets of flexible plastic, they are not used now. Hard disks are made from rigid platters of metallic or ceramic material.

The device that plays the disk is called a disk drive. It contains the mechanical equipment needed to spin or rotate the disk and the read/ write head needed to record and retrieve information to and from the disk.

Hard disk drives are large-capacity storage devices. They operate by the same principles as floppy disk drives, but at much faster speeds. Their capacities are measured in megabytes. The hard disk is used for storing large quantities of information and provides fast access to that information.

The flash drive is convenient for making backup copies of the data on the hard disk, making copies of files that can be mailed to friends or co-workers, and, of course, for putting new programs and information into the computer.

Vocabulary:

Medium – засіб,
a circular platter – кругла площа,
to be coated with – бути вкритим,
to erase – витирати,
laser beams of light – лазерні промені світла,
a floppy disk – дискета,
rigid platters – негнучкі площини,
to spin – крутити,
convenient – зручний.

Comprehensive Questions

1. What is storage? Give the definition in your own words.
2. What is the most widely used medium for storage?
3. What types of disks can you list?
4. What type are floppy and hard disks? What is the difference between them?
5. What devices are needed to record and retrieve information to and from the disk?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

to store data and programs, a medium for the storage part of the system, a circular platter, to be used over and over, the read/write head, to retrieve information to and from the disk, large-capacity storage devices, at much faster speeds, storing large quantities of information, for making backup copies, to be mailed to friends or co-workers.

Exercise 2. Tell what sentences are true, what are false.

1. Memory provides a place to store data and programs before and after processing. 2. Disks have become the most widely used medium for the storage part of the system. 3. A disk is a circular platter on which a recording surface has been applied. 4. The most common type of disk is optical disk. 5. There are two types of magnetic disks: floppy disks and hard disks. 6. Floppy disks are made from rigid platters of metallic or ceramic material. 7. Hard disks are made from thin sheets of flexible plastic. 8. Floppy disks are large-capacity storage devices. 9. Hard disk drives' capacities are measured in megabytes. 10. The flash drive is convenient for making backup copies of the data on the magnetic disk.

Exercise 3. Translate into English.

1. Диски стали найбільш широко використовуваним засобом для зберігання інформації. 2. Він знав, що цей диск може бути витертим і використовуватись знову і знову. 3. Скільки є типів магнітних дисків? 4. Жорсткі диски – це запам'ятовувальні пристрої великої ємності. 5. Дискковод містить механічне обладнання, необхідне для обертання диску та голівку читання/запису. 6. Ємність пам'яті вимірюється у мегабайтах.

Additional Text (for individual work)

Read and translate the text.

Magnetic Disks

Most disks use magnetic recording. The disks themselves may be made of thin plastic sheets (floppy disks), or ceramics or steel (hard disks). Their surfaces are covered in a thin layer of magnetic oxide. Spots of this magnetic oxide can be magnetically polarized. If a suitable designed wire coil is moved across the surface, the polarized spots induce different current in the coil – allowing data to be read back from the disk. New data can be written by moving a coil across the surface with a sufficiently strong current flowing to induce a new magnetic spot with a required polarity. There is no limit on the number of times that data can be rewritten on magnetic disks. The bits are recorded in “tracks” – these form concentric rings on the surface of the disk. Disks have hundreds of these tracks. Tracks are too large a unit of storage – they can hold tens of thousands of bits. Storage on a track is normally broken down into “blocks” or sectors. Nowadays, the operating system program that controls most of the operations of a computer will mandate a particular block size. This is typically in the range 512 bytes to 4096

bytes (sometimes more). The disk controller may identify blocks by block number and track number.

- 1. Put questions to the text.**
- 2. Discuss it with your groupmates.**

Lesson 10

Read and translate the text:

The System Unit

A system unit houses the processor and the memory of a personal computer system. If you were to remove the cover of the system unit and look inside, you would see the parts that make up a system unit. Although it is not necessary to know how each of these parts works, it is useful, from a system's point of view, to know something about how each part contributes to making up the whole system.

If you ignore for the moment all the wires and connections that link the various parts together, you will see the fundamental building blocks of all computer systems and subsystems — the integrated circuit chips. All the functional hardware parts of the computer — input, processor, storage, and output — can be made from integrated circuits.

Working in close conjunction with the microprocessor is a form of storage called the computer's memory. This is where the programs, along with the data to be input and the results to be output, are stored.

ROM (read-only memory) is permanent memory from which the microprocessor can read information, but whose contents can be neither erased nor written over — thus the name, read-only memory. ROM stores the instructions that start up the computer when the power is turned on as well as some additional programs that need never be changed.

RAM (random-access memory) is temporary memory that is empty until the microprocessor needs to use it, that is, until it loads programs and data into it. RAM is often called read/write memory, meaning that the microprocessor can read its contents and write programs or data into it. Most RAM is temporary because it loses its contents when the computer's power is turned off. For long-term storage of information or programs, disk drives are connected to the system.

Memories for personal computers are rated according to their capacity, which is measured in thousands or millions of bytes. A byte consists of eight consecutive bits and is the equivalent of one character, such as a letter, a number, or a punctuation mark.

By themselves, the chips cannot do much — they have to be connected and fed with electricity. The chips are usually mounted on a system board or motherboard — a fiberglass circuit board that contains sockets into which the chips are plugged and a set of tracks (printed on the circuit board) that connects the various chips. Because these tiny integrated circuit chips require so little electricity to operate, a power supply is also housed in the system unit. This converts ordinary

household current into the low-voltage direct current that the integrated circuits require.

Many personal computers also contain a series of sockets, called expansion slots, into which additional circuit boards can be plugged. These additional circuit boards expand the capabilities of the computer. Some can contain additional memory chips, whereas others can provide the ability to connect additional external devices: for example, a modem, a printer, extra disc drives, or other input/output devices, such as a colour display screen.

Vocabulary:

to house – складатися з, вміщати,

to contribute – робити внесок,

to ignore – ігнорувати,

the fundamental building blocks – основні комплектуючі частини,

the integrated circuit – інтегральна схема,

to work in a close conjunction – працювати у тісному зв'язку,

permanent memory – постійна пам'ять,

temporary memory – тимчасова пам'ять,

a content – ємність,

to be rated – бути встановленим,

a punctuation mark – пунктуаційний знак,

household current – побутовий струм,

low-voltage direct current – постійний струм низької напруги,

expansion slot – слот розширення.

Comprehensive Questions

1. What does a system unit house?
2. Where are the computer programs and data stored?
3. What types of the computer's memory do you know?
4. What does "ROM" stand for?
5. What is RAM?
6. What is the difference between permanent and temporary memories?
7. How are memories for personal computers measured?
8. What does a byte consist of?
9. What are expansion slots used for?
10. What does convert ordinary household current into the low-voltage direct current?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

Системний блок, розділовий знак, змінний струм, постійний струм низької напруги, дисковод, резервна копія, запам'ятовувальний пристрій великої ємності, інтегральна схема, мікросхема, центральний процесор, оперативна пам'ять, тимчасова пам'ять, гніздо розширення, джерело електроживлення, зовнішній пристрій, забезпечувати доступ, вилучати, ємність, з'єднувати з системою, записувати інформацію, завантажити програму.

Exercise 2. Choose the necessary word and put it in the sentence.

1. A system unit houses the processor and ... of a personal computer system.
2. All ... of the computer can be made from integrated circuits.
3. Working in close conjunction with the microprocessor is ... called the computer's memory.
4. ... is permanent memory from which the microprocessor can read information.
5. ROM ... the instructions that start up the computer when the power is turned on.
6. RAM is ... that is empty until the microprocessor needs to use it.
7. For long-term storage of information or programs ... are connected to the system.
8. Memories for personal computers ... according to their capacity.
9. The chips are usually ... on a system board or motherboard.
10. These additional circuit boards ... the capabilities of the computer.

1. stores
2. ROM
3. temporary memory
4. the memory
5. disk drives
6. the functional hardware parts
7. expand
8. mounted
9. are rated
10. a form of storage

Exercise 3. Complete the sentences.

1. A system unit houses ... and ... of a personal computer system. 2. All the functional hardware parts of the computer — input, processor, storage, and output can be made from ... 3. ... is where the programs, along with the data to be input and the results to be output, are stored. 4. ... is permanent memory from which the microprocessor can read information, but whose contents can be neither erased nor written over. 5. ... is temporary memory that is empty until the microprocessor needs to use it, that is, until it loads programs and data into it. 6. RAM is often called ... , meaning that the microprocessor can read its contents and write programs or data into it. 7. Most ... is temporary because it loses its contents when the computer's power is turned off. 8. Memories for personal computers are measured in thousands or millions of ... 9. ... are usually mounted on a system board or motherboard that contains sockets into which the chips are plugged and a set of tracks that connects the various chips. 10. Many personal computers also contain a series of sockets, called expansion slots, into which additional circuit boards can be ...

Exercise 4. Translate into English.

1. Я думаю, що не є необхідністю знати все як кожна частина комп'ютера працює. 2. Ввідні пристрої, процесор, пам'ять і вивідні пристрої є функціональними частинами апаратного забезпечення комп'ютера. 3. ROM є постійною пам'яттю комп'ютера з якої мікропроцесор може зчитувати інформацію. 4. Тимчасова пам'ять (RAM) втрачає свій вміст, коли

вимикається живлення. 5. Від чого залежить пам'ять персональних комп'ютерів? 6. Чи ти знаєш, що слоти (гнізда) розширення збільшують потужність комп'ютера. 7. Які основні комплектуючі частини системного блоку ти знаєш? 8. Чим більша потужність комп'ютера, тим більша у нього пам'ять. 9. Для тривалого зберігання інформації чи програм, дискові драйвери приєднуються до системи. 10. Комп'ютерна пам'ять вимірюється у байтах. Це місце, де програми разом з даними зберігаються і результати виводяться на екран.

Lesson 11

Read and translate the text:

Personal Computer Systems. Keyboard, Display and Printers.

A keyboard is a device that converts keystrokes into codes that can be electronically manipulated by the computer. With it, you can enter commands or data into the computer. A personal computer keyboard includes a typewriter layout and a set of keys marked with arrows that control the movement of a visual aid – a cursor – on the display screen. Some keyboards include a numeric keypad for number-intensive data entry and calculations as well as a set of function keys. These are general-purpose keys that perform special functions, depending on the application.

Keyboards are not the only way to communicate with a computer. Touching the screen with your finger, talking to a computer, writing with an electronic pen, and rolling a mouse or trackball are all alternative input devices.

A mouse is a pointing device that combines the traditional cursor movements – accomplished by pressing arrow keys — with the means to select an object on the display screen. One or more buttons located on the top of the mouse enable you to choose options. Small portable computers sometimes use a built-in or attachable trackball in lieu of a mouse. Rolling the trackball with your fingertips produces the same results as moving the mouse.

A display, often called a monitor, is one of the output parts of the system. A display is a device that is used (1) to give you feedback while you operate the computer and (2) to view the computer's output. For example, when you type on the keyboard, the letters are immediately displayed along with the cursor, which indicates where the next letter you type will appear.

The display is often a CRT (cathode ray tube). Flat screens, such as LCDs (liquid crystal displays), are commonly used in portable computers. LCDs are larger versions of the displays found in digital watches and calculators.

A printer is a device that produces paper-copy output from a computer system. One way to classify printers is by the method used to form the printed images. Dot-matrix printers form characters with a pattern of dots. Laser printers create images with a laser beam scanning across an electrically charged drum. As in a copier, toner or ink with an opposite charge sticks to the drum and is then transferred to paper by pressure and heat to create the finished image. Laser

printers offer higher speed and quality than conventional printers. They can mix type styles and sizes as well as graphic images on the same page.

Printers for personal computers are connected to the computer by a cable through a port — the location through which the computer exchanges information with an external device. A port has a physical connector and an address, so that programs know where to send information. The two basic types of ports are serial and parallel.

Vocabulary:

Keystrokes – натискання клавіш,
to manipulate – керувати,
a typewriter layout – схема друкарської машинки,
a visual aid – візуальна допомога,
general-purpose keys – клавіші загального призначення,
in lieu of – замість,
feedback – зворотній зв'язок.

Comprehensive Questions

1. What is a keyboard designed for?
2. When do you use a numeric keypad?
3. What are other alternative input devices?
4. What is a mouse?
5. What is a display?
6. Can you explain the difference between CRT and LCD displays?
7. What is a printer?
8. In what way are printers classified?
9. What type of printers is the best? Why?
10. How are printers connected to the computer?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

To convert keystrokes into codes, to enter commands or data into the computer, a typewriter layout, the movement of a visual aid, to perform special functions, to communicate with a computer, touching the screen with your finger, all alternative input devices, small portable computers, to view the computer's output, to create the finished image, to offer higher speed and quality, to mix type styles and sizes, a physical connector and an address.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|--|-----------------------------|
| 1. A keyboard is a device that ... | 1. images |
| keystrokes into codes that can be | 2. keyboards |
| electronically manipulated by the computer. | 3. portable computers |
| 2. Some ... include a numeric keypad | 4. the output parts |
| for number-intensive data entry and calculations | 5. converts |
| as well as a set of function keys. | 6. a physical connector and |

- | | |
|--|-----------------------|
| 3. A mouse is that combines the traditional cursor movements accomplished by pressing arrow keys. | an address |
| 4. A monitor is one of parts of the system. | 7. a display |
| 5. ... is used to give you feedback while you operate the computer and to view the computer's output. | 8. a pointing device |
| 6. Flat screens, such as LCDs are used in | 9. laser printers |
| 7. A printer is a device that produces from a computer system. | 10. paper-copy output |
| 8. Laser printers create ... with a laser beam scanning across an electrically charged drum. | |
| 9. ... can mix type styles and sizes as well as graphic images on the same page. | |
| 10. A port has, so that programs know where to send information. | |

Exercise 3. Tell what sentences are true, what are false.

1. With a keyboard, you can enter commands or data into the computer. 2. Some keyboards include a numeric keypad for number-intensive data processing and calculations. 3. These are special-purpose keys that perform special functions, depending on the application. 4. Keyboards are the only way to communicate with a computer. 5. Small desktops sometimes use a built-in or attachable trackball in lieu of a mouse. 6. A display, often called a monitor, is one of the output parts of the system. 7. CRTs are larger versions of the displays found in digital watches and calculators. 8. Laser printers create images with a laser beam scanning across an electrically charged drum. 9. Dot-matrix printers offer higher speed and quality than conventional printers. 10. A port is the location through which the computer exchanges information with an external device.

Exercise 4. Translate into English.

1. Клавіатура — це пристрій, призначений для введення в комп'ютер інформації та команд керування. 2. Група цифрових клавіш, призначена для введення чисел. 3. Клавіші зі стрілками керують переміщенням курсора по екрану монітора. 4. Мишка і трекбол використовуються для керування курсором і подання деяких команд. 5. Принтери під'єднуються до комп'ютера за допомогою кабеля через порт. 6. Які екрани вживаються у портативних комп'ютерах? 7. Клавіатура не єдиний шлях спілкування з комп'ютером. 8. Чи знаєш ти, як лазерні принтери створюють зображення? 9. Принтер — це пристрій, призначений для виведення на папір результатів роботи програм. 10. Клавіатура персонального комп'ютера включає схему друкарської машинки і групу клавіш, які контролюють рух курсора на екрані дисплея.

Additional Text (for individual work)

Read and translate the text.

Printers provide information in a permanent, human-readable form. They are the most commonly used output devices and are components of almost all computer systems. Printers vary greatly in performance and design. They are classified as character printers, line printers and page printers in order to identify three different approaches to printing, each with a different speed range. In addition, printers can be described as either impact or nonimpact. Printers that use electromechanical mechanisms that cause hammers to strike against a ribbon and the paper are called impact printers. Nonimpact printers do not hit or impact a ribbon to print.

There are also a light emitting diode (LED) printers. They were developed by Casio and are printers capable of printing at the same or close to the same quality as most laser printers. LED printers work much like laser printers, but utilize a LED panel that recreates the image on a negatively charged drum. The areas where the light hits the drum become less charged which attracts toner. The printer then transfers the toner from the drum to the paper and applies intense heat to fuse the toner to the paper.

Created by Charles W. Hull in 1984, the 3D printer is a sophisticated printing device that uses a design from a digital image to produce an identical physical object using material such as metal alloys, polymers, or plastics.

There is also a multifunction printer (MFP) or All-In-One printer (AIO). It is used to describe a hardware device such as an all-in-one printer that is a printer, fax and scanner and everything you'd need in one device.

The advantages of AIO devices are that they take up less desk space and room by combining multiple devices (e.g. fax, printer, scanner) into one device and they only require one power cord and usually one data (USB) cable.

1. Put questions to the text.

2. Translate the sentences into English.

1. Принтери видають інформацію у доступній для людей, читабельній формі.
2. Принтери не всі однакові, так як відрізняються продуктивністю та будовою.
3. Принтери класифікують як пристрої друку символами, пристрої друку рядками і пристрої друку сторінками.
4. Тривимірні принтери використовують у автоматизованому проектуванні.
5. Перевагами мультифункціонального принтера є те, що він займає менше місця та потребує одного шнура живлення та кабеля даних.

Lesson 12

Read and translate the text:

Scanners

Scanners convert optically focused images, such as text, line drawings, or photographs into digital representations that are suitable for processing. When an image is translated into a series of Os and Is, it can then be processed like any other digital data.

Scanners trace their roots to several technologies and devices, including magnetic-ink character recognition, bar codes, and optical character recognition. The earliest form of scanner used magnetic-ink character recognition (MICR), a form of character recognition that reads text printed with magnetically charged ink. At the time MICR was developed, optical methods had not yet been developed. MICR is still predominantly used by the banking industry for processing checks. MICR makes check processing faster and more accurate by capturing data directly from their source without a separate transcribing step.

Another form of scanning uses bar codes. Supermarkets use the Universal Product code (UPC), which consists of a series of thick and thin bar codes that represent numbers. Today, bar codes are used in factories and offices.

Optical character recognition (OCR) is the process of examining characters on a printed page and translating them into computer text. OCR was originally designed for input to typesetting machines for the newspaper industry. It was thought that relatively untrained typists could retype copy for OCR input and feel it into scanner, thus cutting costs, reducing mistakes, and speeding up the newspaper composition process.

In 1976 Raymond Kurzweil introduced a reading machine to scan printed documents and, using electronic voice output, read them aloud to the blind or visually impaired. This OCR breakthrough technology could be trained to read the different fonts it encountered. Although some problems are still formidable, today there are a wide variety of low-cost OCR software interfaces between scanners and personal computers. These programs use various methods of character recognition to convert scanned text into a file, suitable for import into a word processor, spreadsheet, or database program. They also interlace with most popular scanners; are able to differentiate automatically among graphics, text, and multiple columns; and handle such nuances as regular text versus boldface, italic, or underlined text.

Image recognition. A useful application for scanners is to capture images such as line drawings, illustrations, or photographs, and convert them into digital data that can be manipulated, retouched, cropped or resized, and printed. The resolution of a scanner is defined as the number of bits per unit of measure, simply called dots per inch (dpi). Scanner resolution ranges from 75 dots per inch to thousands of dots per inch, but the most common scanner resolution is 600 dots per inch.

Vocabulary:

To convert – перетворювати,
line drawings – малюнки,

to trace the roots – сягати корінням,
 magnetic-ink character recognition (MICR) – магнітно-чорнильне розпізнавання символів,
 bar codes – штрих-коди,
 optical character recognition (OCR) – оптичне розпізнавання символів,
 to cut costs – скорочувати витрати,
 a reading machine – зчитуюча машина,
 a breakthrough technology – проривна технологія,
 a font – шрифт,
 formidable – величезний,
 a spreadsheet – програма табличних обчислень,
 to interlace – переплітатися,
 to handle – обробляти,
 versus – у порівнянні,
 boldface – жирний (шрифт),
 italic – курсив,
 to capture images – захоплювати зображення,
 to retouch – ретушувати,
 a resolution – розширення, роздільна здатність.

Comprehensive Questions

1. What is a scanner? Give the definition in your own words.
2. What technology is used in scanners?
3. What was the purpose of developing MICR?
4. Where is MICR still predominantly used by?
5. What are the advantages of MICR application?
6. In what businesses are bar codes used?
7. Who and when introduced a reading machine to scan printed documents?
8. What is OCR? Explain in your own words.
9. What was OCR originally designed for?
10. How is the resolution of a scanner defined?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

Optically focused images, to be suitable for processing, magnetically charged ink, faster and more accurate, the process of examining characters, to convert scanned text into a file, underlined text, image recognition, cropped or resized, dots per inch.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|---|----------------------------|
| 1. Scanners convert optically focused images into ... that are suitable for processing. | 1. OCR software interfaces |
| 2. The earliest form of scanner used ... | 2. breakthrough technology |
| 3. MICR is still predominantly used by ... | 3. examining characters |
| | 4. various methods |
| | 5. digital representation |

- | | |
|--|--|
| 4. Another form of scanning uses | 6. resolution |
| 5. Optical character recognition is the process of on a printed page and translating them into computer text. | 7. for processing checks |
| 6. OCR was originally designed for input to typesetting machines for the | 8. bar codes |
| 7. This OCR could be trained to read the different fonts it encountered. | 9. newspaper industry |
| 8. There are a wide variety of low-cost between scanners and personal computers. | 10. magnetic-ink character recognition |
| 9. These programs use of character recognition to convert scanned text into a file. | |
| 10. Scanner ... ranges from 75 dots per inch to thousands of dots per inch. | |

Exercise 3. Complete the sentences.

1. Scanners convert optically focused images, such as text, line drawings, or photographs into digital representations that are 2. When an image is translated into a series of Os and Is, it can then 3. Scanners trace their roots to several technologies and devices, including magnetic-ink character recognition, bar codes, and 4. MICR makes check processing faster and more accurate by 5. Supermarkets use the Universal Product code (UPC), which consists of a series of thick and thin 6. Relatively untrained typists could retype copy for OCR input and feed it into scanner, thus cutting costs, reducing mistakes, and 7. In 1976 Raymond Kurzweil introduced a reading machine to scan printed documents and, using electronic voice output, read them aloud to 8. These programs use various methods of character recognition to convert scanned text into a file, suitable for import into 9. A useful application for scanners is and convert them into digital data 10. Scanner resolution ranges from 75 dots per inch to thousands of dots per inch, but the most common scanner resolution is

Exercise 4. Translate into English.

1. Сканери призначені для введення в комп'ютер графічних об'єктів (малюнків, фотографій та ін.). 2. Принцип дії сканера ґрунтується на перетворенні зображення в електричні сигнали. 3. Основною характеристикою сканера є роздільна здатність, яка визначається кількістю точок на дюйм. 4. Сканери використовуються також для введення текстової інформації. 5. Магнітно-чорнильне розпізнавання символів переважно використовується у баківській промисловості для обробки чеків, яке робить цей процес швидшим і більш точнішим. 6. Сьогодні штрих-коди використовуються на всіх фабриках і заводах. 7. Оптичне розпізнавання символів було винайдене для газетної промисловості, що скоротило витрати, зменшило помилки і пришвидшило процес складання газети. 8. Я не знав, що у найпершій формі сканера використовувалось лише магнітно-чорнильне

розпізнавання символів. 9. Сьогодні є величезна різноманітність сканерів з великим розширенням. 10. Яке розширення у твого сканера?

Lesson 13

Read and translate the text:

Computers: the Software and the Hardware

To use a computer to solve problems we must have a computer system, i.e. a collection of components that work together to process data. A computer system combines hardware elements with software elements. Hardware elements may be defined as the mechanical devices in the system, the machinery and the electronics that perform physical functions. The software elements are the programs written for the system that perform logical and mathematical operations and provide means for you to control the system.

Besides there is a documentation that includes the manuals and listenings that tell you how to use the hardware and software.

So, the components of a computer system include: system hardware, system software, system documentation. Hardware system includes a terminal used like a typewriter for two-way communication between the user and the system, a storage medium for storing programmes and data and the computer itself.

System users having specific needs can obtain optional peripheral devices added to a computer system. For example, computer systems used primary for programme development may have extra storage devices and a high-speed printing device. Computer system used in a laboratory may have graphics display hardware device, an analog-to-digital converter.

System software is an organized set of supplied programmes that effectively transform the system hardware components into usable tools. These programmes include operations, functions, and routines that make it easier for you to use the hardware to solve problems and produce results. For example, some system programmes store and retrieve data among the various peripheral devices. Others perform difficult and lengthy mathematical calculations. Some programmes allow you to create, edit and process application programmes of your own.

System software always includes an operating system, which is the “intelligence” of the computer system. Usually the system software includes one or several language processors.

Vocabulary:

Hardware – апаратне забезпечення,
software – програмне забезпечення,
to define – визначати, характеризувати,
means (pl.) – засіб, спосіб,
manual – довідник, постанова,
listenings – записи, прослуховування,
to obtain – одержувати,

optional – необов’язковий,
routine – шаблон,
to retrieve – відновлювати, знаходити знову,
to edit – редагувати, публікувати,
“intelligence” – розум, інтелект.

Comprehensive Questions

1. What does a computer system combine?
2. How may hardware elements be defined?
3. What are the software elements?
4. What does documentation include?
5. What do the components of a computer system include?
6. What does the hardware system include?
7. How do the specific needs of system users can be obtained?
8. What is system software?
9. What operations can software programmes’ perform?
10. What is an operating system?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

a collection of components, the mechanical devices in the system, a high-speed printing device, to combine hardware elements with software elements, two-way communication, a storage medium for storing programmes, an analog-to-digital converter, an organized set of supplied programmes, lengthy mathematical calculations, several language processors.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|---|-----------------------------------|
| 1. To use a computer to solve problems
we must have | 1. a documentation |
| 2. A computer system ... hardware elements
with software elements. | 2. software elements |
| 3. are mechanical devices in the system
that perform physical functions. | 3. a terminal |
| 4. are the programmes written for the
system that perform logical and mathematical
operations. | 4. a computer system |
| 5. ... includes the manuals and listenings that tell
you how to use the hardware and software. | 5. retrieve data |
| 6. Hardware system includes ... used like a typewriter
for two-way communication between the user and
the system. | 6. optional peripheral
devices |
| 7. System users can obtain added to
a computer system. | 7. hardware elements |
| 8. is an organized set of supplied programmes
that transform the system hardware components | 8. operating system |
| | 9. system software |
| | 10. combines |

into usable tools.

9. Some system programme store and ... among the various peripheral devices.

10. System software always includes ... , which is the “intelligence” of the computer system.

Exercise 3. Tell what sentences are true, what are false.

1. To use a computer to solve problems we must have a computer system, i.e. a collection of components that work together to perform lengthy mathematical calculations. 2. Hardware elements may be defined as the mechanical devices in the system, the machinery and the electronics that perform logical and mathematical operations. 3. There is a documentation that includes the manuals and listenings that tell you how to use the hardware and software. 4. The components of a computer system include system hardware, system software, system documentation. 5. Hardware system may have extra storage devices and a high-speed printing device. 6. Computer system used in a laboratory may have graphics display hardware device, an analog-to-digital converter. 7. System users can obtain optional peripheral devices added to a computer system. 8. Hardware programmes include operations, functions, and routines that make it easier for you to use the software to solve problems and produce results. 9. Some system programme store and retrieve data among the various peripheral devices. 10. System software always includes one language processor, which is the “intelligence” of the computer system.

Exercise 4. Translate into English.

1. Комп'ютерна система є набором компонентів, які працюють разом, щоб обробляти дані. 2. Елементи програмного забезпечення є програмами, які написані для системи, щоб виконувати логічні та математичні операції. 3. Чи ти знаєш, які фізичні функції виконують елементи апаратного забезпечення? 4. Комп'ютерна система поєднує елементи апаратного забезпечення з елементами програмного забезпечення. 5. Він сказав, що компоненти комп'ютерної системи включають систему апаратного забезпечення, систему програмного забезпечення і системну документацію. 6. Що необхідно для двохстороннього спілкування між користувачем і системою? 7. Деякі програми зберігають і обробляють дані з поміж різних периферійних пристроїв. 8. Я можу виконати всі складні обчислення за допомогою програми з програмного забезпечення. 9. Операційна система вважається «інтелектом» комп'ютера. 10. Система програмного забезпечення включає один чи декілька мовних редакторів.

**Additional Text
(for individual work)**

Read and translate the text.

Applications software are the programs written to solve specific problems (applications), such as payroll, inventory control and investment analysis. The

word program usually refers to an application program, and the word programmer is usually a person who prepares applications software.

Often programs, particular systems software are stored in an area of memory called read-only memory (ROM) which can be read from but not written on.

Firmware is a term that is commonly used to describe certain programs that are stored in ROM. Firmware often refers to a sequence of instructions (software) that is substituted for hardware. For example, in an instance where cost is more important than performance, the computer system architect might decide not to use special electronic circuits (hardware) to multiply two numbers but instead write instructions (software) to cause the machine to accomplish the same function by repeated use of circuits already designed to perform addition.

1. Give the title to the text.

2. Put questions to the text.

Text 14

Read and translate the text:

Programming

A modern digital computer is simply a device that follows instructions. These instructions tell the computer how to perform specific actions such as writing information to the video screen, performing complex computations, or reading data from a floppy disk.

In order to solve a problem using a computer, we must express the solution to the problem in terms of the instructions of the particular computer.

A computer program is actually just a list of instructions necessary to solve a specific problem, and the creation of this instruction list is computer programming. Programming is the process of producing a set of instructions for a computer to make it perform a specific task. The task can be anything from the solution to a mathematical problem to the production of a graphics package.

The approach or method that is used to solve the problem is known as an algorithm. For example, if we wish to develop a program that tests if a number is odd or even, then the set of statements which solves the problem becomes the problem. The method that is used to test if the number is even or odd is the algorithm. To develop a program, to solve a particular problem, we first express the solution to the problem in terms of an algorithm and develop a program, which implements this algorithm. Then we can proceed to write the instructions necessary to implement the algorithm on a particular computer system. These instructions would be expressed in the statements of a particular computer language, such as BASIC, PASCAL or C.

Vocabulary:

Actually – насправді, фактично,
a graphics package – графічний пакет,
odd – непарний,

even – парний,
the set of instructions – пакет інструкцій,
particular – даний, конкретний,
to implement – виконувати, здійснювати,
to proceed – приступити, перейти до чогось.

Comprehensive Questions

1. What is a modern digital computer?
2. What actions do the instructions tell the computer to perform?
3. What must we do to solve a problem using a computer?
4. What is a computer program?
5. What is programming?
6. What can the task be?
7. What is considered to be an algorithm?
8. What should be done to develop a program to solve a particular problem?
9. What do we do after solving a particular problem?
10. How would the instructions be expressed?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

A modern digital computer, to follow instructions, to perform specific actions, to solve a problem, a specific task, even or odd, the production of a graphics package, to develop a program, to implement the algorithm, a particular computer language.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|--|------------------------------|
| 1. ... is simply a device that follows instructions. | 1. programming |
| 2. ... tell the computer how to perform specific actions. | 2. to develop a program |
| 3. We must express the solution to the problem in terms of the instructions of the particular computer ... | 3. to write the instructions |
| 4. ... is a list of instructions necessary to solve a specific problem. | 4. a modern digital computer |
| 5. The creation of this instruction list is ... | 5. to solve a problem |
| 6. ... is the process of producing a set of instructions for a computer to make it perform a specific task. | 6. computer programming |
| 7. The approach or method that is used to solve the problem is known as ... | 7. an algorithm |
| 8. ... we first express the solution to the problem in terms of an algorithm and develop a program, which implements this algorithm. | 8. a computer program |
| 9. Then we can proceed ... necessary to implement | 9. computer language |
| | 10. the instructions |

the algorithm on a particular computer system.

10. These instructions would be expressed in the statements of a particular such as BASIC, PASCAL or C.

Exercise 3. Complete the sentences.

1. A modern digital computer is simply a device that 2. These instructions tell the computer how to perform specific actions such as 3. In order to solve a problem using a computer, we must 4. A computer program is actually just a list of instructions necessary to solve a specific problem, and 5. Programming is the process of producing a set of instructions for a computer 6. The task can be anything from the solution to a mathematical problem to 7. The approach or method that is used to solve the problem is known as 8. The method that is used to test if the number is even or odd is 9. Then we can proceed to write the instructions necessary to implement the algorithm on 10. These instructions would be expressed in the statements of a particular computer language, such as

Exercise 4. Translate into English.

1. У нього сучасний цифровий комп'ютер найостаннішої моделі. 2. Я впевнений, що ця комп'ютерна програма допоможе мені вирішити цю специфічну проблему. 3. Який метод використовується, щоб перевірити чи число є парне або непарне? 4. Він не знав, що програмування це процес створення пакету інструкцій для комп'ютера, щоб він виконав певне завдання. 5. Які комп'ютерні мови ти знаєш? 6. Ви можете вже перейти до програмування. 7. Скажи мені, який алгоритм використовується для вирішення цієї проблеми? 8. Це складне обчислення щойно виконали. 9. Вона сказала, що ця комп'ютерна програма не використовується для цього завдання. 10. Можеш ти написати інструкції необхідні для виконання алгоритма на комп'ютерній системі?

Additional Text (for individual work)

Read and translate the text.

Computer Programming

There are two techniques for planning the logic of a program. The first technique is flowcharting. A flowchart is a plan in the form of a graphic or pictorial representation that uses predefined symbols to illustrate the program logic. It is, therefore, a "picture" of the logical steps to be performed by the computer. Each of the predefined symbol shapes stands for a general operation, and the specifics are written within the symbol. A plastic or metal guide called a template is used to make drawing the symbols easier.

The second technique for planning logic is called pseudocode. Pseudocode is an imitation of actual program instructions. It allows a program-like structure without the burden of programming rules to follow. Pseudocode is less time-

consuming for the professional programmer than is flowcharting. It also emphasizes a top-down approach to program structure.

Pseudocode has three basic structures: sequence, decision, and looping logic. With these three structures, any required logic can be expressed.

1. Put questions to the text.

2. Discuss it with your groupmates.

Lesson 15

Read and translate the text:

Communication with a Computer

Men use languages in order to communicate with each other. When the man wishes to communicate with the computer he uses in the same way “languages” such as BASIC, PASCAL, ADA, FORTRAN, ALGOL, COBOL, C, C++, DELFI and others.

BASIC (Beginners All-purpose Symbolic Instructional Code) is considered to be one of the easiest programming languages to learn. It is now used almost universally.

PASCAL is an algorithmic general purpose high level programming language. Niklaus Emil Wirth, the Swedish programmer and programming theorist has developed this language and named it after the famous French mathematician, Blaise Pascal. This language teaches a structured approach to programming.

ADA (a government (especially military) computer language) is a high level programming language. It is a PASCAL-based language, but much more comprehensive than PASCAL. It was named after Augusta Ada Byron (1816 – 1852), daughter of the English poet, Lord Byron.

FORTRAN (Formula Translation) is a problem oriented high level programming language for scientific and mathematical use. FORTRAN was the first high level programming language. It was developed in 1956 and was designed to easily express mathematical formulas for computer processing. It is still widely used as a programming language.

ALGOL (Algorithmic Language) was developed as an international language for the expression of the algorithms between individuals as well as a programming language. It was introduced in the early 1960s. ALGOL was originally known as IAL or International Algebraic Language.

COBOL (Common Business-Oriented Language) is internationally accepted programming language developed for general commercial use. The advantages of using COBOL are that it is relatively simple to learn and programs can be quickly written and tested. Programmers can easily understand programs not written by themselves.

C++ is an object-oriented at all levels programming language based on C.

DELFİ is an object-oriented programming language based on PASCAL.

Vocabulary:

To consider – вважати,
universally – в усьому світі,
to be named after – називати в ім'я, на честь,
comprehensive – обширний,
originally – спочатку.

Notes:

Object-oriented programming is based on the interaction between it by exchange of the messages. OOP is based on the usage of the main components that are called paradigm of the OOP. The key concepts of the OOP are:

Abstraction

Inheritance

Encapsulation

Polymorphism

Abstraction provides the usage of abstract models of real-time objects that includes objects characteristics necessary to solve tasks in it.

Inheritance provides the transfer of characteristics from one parents object relevant to other in the process of inheritance. The relevant object inherits all or a part of the parents' object characteristics and besides acquires its own characteristics or changes the inherited. The OOP process of inheritance is designed for developing objects and class hierarchy.

Encapsulation is a process of data hiding designed for access limitation of the other objects to the properties and characteristics of the given objects.

Polymorphism is a property of the objects to react differently the same instructions. This property allows to use the same commands for the interaction with the same objects.

Comprehensive Questions

1. Why do men use languages?
2. What computer “languages” do you know?
3. What is the easiest programming language to learn?
4. What is the general purpose of high level programming language?
5. What language is much more comprehensive than PASCAL?
6. What was the first high level programming language? When was it developed?
7. What programming language was designed to express mathematical formulas for computer processing?
8. What programming language was developed for the expression of the algorithms between individuals? When was it introduced?
9. What programming language was developed for general commercial use?
10. What are the advantages of COBOL?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

To communicate with each other, the easiest programming languages to be used, universally, a general purpose high level programming language, a PASCAL-based language, to be named after, to express mathematical formulas, for scientific and mathematical use, International Algebraic Language (IAL), for general commercial use.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|---|------------|
| 1. ... is considered to be one of the easiest programming languages to learn. | 1. COBOL |
| 2. ... is a general purpose high level programming language. | 2. FORTRAN |
| 3. ... is a high level programming language. | 3. C++ |
| 4. ... is a problem oriented high level programming language for scientific and mathematical use. | 4. BASIC |
| 5. ... is a programming language for the expression of the algorithms between individuals. | 5. PASCAL |
| 6. ... is internationally accepted programming language developed for general commercial use. | 6. DELFI |
| 7. ... is an object-oriented at all levels programming language based on C. | 7. ALGOL |
| 8. ... is an object-oriented programming language based on PASCAL. | 8. ADA |

Exercise 3. Translate into English.

1. Люди використовують різні мови програмування, щоб спілкуватися один з одним. 2. Я не знав, що найлегшою мовою програмування для вивчення є Паскаль. 3. Паскаль – високорівнева мова програмування загального призначення. 4. Яка високорівнева мова програмування була названа на честь Августи Ади Байрон, дочки англійського поета лорда Байрона? 5. Він не знав, що Коболь – мова програмування для загального комерційного використання. 6. C++ і Делфі є об'єктно-орієнтованими високорівневими мовами програмування. 7. Фортран – проблемно-орієнтована високорівнева мова програмування для наукового та математичного використання. 8. Він сказав, що Коболь – відносно легка мова програмування для вивчення. 9. Які мови програмування ти знаєш? 10. Я не знав, що необхідно уникати старіших мов програмування таких як Фортран і Коболь.

Exercise 4. Complete the sentences finding the end in the right column.

1. Men use languages in order	 general commercial use.
2. BASIC is considered	 Augusta Ada Byron, daughter of the English poet, Lord Byron.
3. PASCAL was named after	 not written by themselves.
4. ADA was named after	 the early 1960s.
5. FORTRAN is a problem oriented high level programming language for	 the famous French mathematician Blaise Pascal.
6. FORTRAN was the first	 a high level programming language.
7. ALGOL was developed as	 at all levels programming language based on C.
8. FORTRAN was developed in	 to be one of the easiest programming languages to learn.
9. COBOL is internationally accepted programming language developed for	 scientific and mathematical use.
10. Programmers can easily understand programs	 an international language for the expression of the algorithms between individuals.
11. C++ is an object-oriented	 based on PASCAL.
12. DELFI is an object-oriented programming language	 to communicate with each other.

**Additional Text
(for individual work)**

Read and translate the text.

At a superficial level, programming languages and natural languages are similar. Programming languages have grammatical rules that need to be learnt, just as natural languages do. At the same level, computers can “understand” and communicate with” humans through programming languages: superficial interaction is possible. However, programming languages are data-free and therefore contain no information in themselves. The information is contained in the data which is processed, but is independent of the language which is used to write the commands to proceed it. The sole purpose of a programming language is to give instructions to a computer, which – providing they are syntactically correct – will be executed. A syntactically correct statement in a programming language has only one interpretation. By definition, it cannot be ambiguous. You cannot jokes in computer languages.

C developed in the 1970s to support the UNIX operating system. C is a highly portable general-purpose language. C was designed to be a language that would be suitable for writing system's software, like the core parts of an operating system. The code generated by the compiler had to be very efficient if the language was to be used in this way. Anything a compiler would have difficulties with was dropped. Consequently, in some respects the language is simpler than Algol family languages that have retained the relatively complex nested program structures. If C was to be used for writing things like "device driver code" (the code that actually interacts with the peripheral controllers), then it had to allow the programmer get down the hardware level and manipulate bits in specific registers and in particular memory addresses. This gives the programmer considerable power, and lots of responsibility.

Other such languages are **APL** (developed in 1962), **LISP** and **PROLOG** both of which are used for work in artificial intelligence. **LOGO** is a development of LISP which has been used to develop computer based training packages.

1. Put questions to the text.

2. Discuss it with your groupmates.

Lesson 16

Read and retell the text:

C++ - an Object-Oriented Programming Language

In 1983, several modifications and extensions had already been made to C with classes. In that year, the name «C++» was coined. Ever since then, the ++ suffix has become a synonym for object-orientation. (Bjarne Stroustrup could have made a fortune only by registering ++ as a trademark). The number of users was doubling every few months – and so was the number of compilers and extensions to the language.

C++ differs from other object-oriented languages in many ways. For instance, C++ is not a root-based language, nor does it operate on a runtime virtual machine. These differences significantly broaden the domains in which C++ can be used.

The fact that legacy C code can be combined seamlessly with new C++ code is its major advantage. Migration from C to C++ does not force you to throw away good, functional C code. Many commercial frameworks, and even some components of the Standard Library itself, are built upon legacy C code that is wrapped in an object-oriented interface.

In addition to object-oriented programming, C++ supports other useful programming styles, including procedural programming, object-based programming, and generic programming – making it a multi-paradigm, general-purpose programming language.

C programmers who make their first steps in C++ are not forced to throw all their expertise away. Many primitives and fundamental concepts of C++ were inherited from C, including built-in operators and fundamental types, pointers, the

notion of dynamic memory allocation, header files, preprocessor, and so on. As a transient phase, C programmers can still remain productive when the shift to C++ is made.

C++ and C code can work together. Under certain conditions, this combination is synergetic and robust. Object-Oriented Programming is the most widely used style of programming in C++. There is no universal consensus as to what OO really is; the definitions vary among schools, languages, and users. There is, however, a consensus about a common denominator – a combination of encapsulation, information hiding, polymorphism, dynamic binding, and inheritance. Some maintain that advanced object-oriented consists of generic programming support and multiple inheritance.

C++ today is very different from what it was in 1983, when it was first named «C++». Many features have been added to the language since then; older features have been modified, and a few features have been deprecated or removed entirely from the language. Some of the extensions have radically changed programming styles and concepts. These have made C++ the powerful and robust multipurpose programming language that it is today. The evolution of C++ has been a continuous and progressive process. Programmers who learned C++ only three or five years ago and haven't caught up with the extensions often discover that the language slips through their fingers: Existing pieces of code do not compile any more, others compile with a plethora of compiler warnings, and the source code listings in object-oriented magazines seem substantially different from the way they looked not so long ago. «Names paces? Never heard of these before,» and «What was wrong with C-style cast? Why shouldn't I use it anymore?» are some of the frequently asked questions in various C++ forums and conferences.

Vocabulary

To be coined – бути створеним, вигаданим,
to compile – збирати, укладати, а compiler – укладач,
a root-based language – коренево-орієнтована мова,
a legacy – спадок,
seamlessly – легко,
a framework – інтегрована схема,
to be wrapped – бути обгорнутим,
procedural programming – процедурне програмування,
generic programming – узагальнене програмування,
general-purpose programming language – мова програмування загального призначення,
to inherit – успадковувати,
an expertise – експертиза,
pointers – покажчики,
notion of dynamic memory allocation – поняття розташування динамічної пам'яті,
header files – файли заголовків,
a transient phase – перехідний етап,
a shift – перехід,

synergetic and robust – взаємодіючий і міцний,
 a common denominator – спільний знаменник,
 multiple inheritance – багаточисельне успадкування,
 encapsulation – інкапсуляція,
 information hiding – приховування інформації,
 dynamic binding – динамічне зв'язування,
 to deprecate – заперечувати,
 radically – радикально, повністю,
 a plethora of compiler warnings – безліч попереджень укладача,
 code listings – код оголошень.

Comprehensive Questions

1. When had already been made several modifications and extensions to C with classes?
2. When was the name «C++» coined?
3. Who has registered ++ as a trademark?
4. What has become a synonym for object-orientation?
5. How does C++ differ from other object-oriented languages?
6. What is a major advantage of C++?
7. What other useful programming styles does C++ support?
8. What was inherited from C by C++?
9. What is the most widely used style of programming in C++?
10. Is C++ today very different from what it was in 1983?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

Modifications and extensions, the number of compilers, to be combined seamlessly with ..., to be wrapped in an object-oriented interface, many primitives and fundamental concepts, the most widely used style of programming, to be removed entirely from the language, the powerful and robust multipurpose programming language, programming styles and concepts, continuous and progressive process.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|---|--------------------------------|
| 1. In 1983 the name «C++» | 1. programming |
| 2. C++ is not ... , nor does it operate on a runtime virtual machine. | 2. supports |
| 3. ... C code can be combined seamlessly with new C++ code. | 3. generic programming support |
| 4. C++ ... other useful programming styles. | 4. object-orientation |
| 5. The ++ suffix has become a synonym for | 5. legacy |
| 6. Many primitives and fundamental concepts of C++ were ... from C. | 6. was coined |
| 7. The combination of C++ and C code is | 7. continuous and progressive |
| | 8. inherited |
| | 9. synergetic and robust |
| | 10. a root-based language |

8. Object-Oriented Programming is the most widely used style of ... C++.
9. Some maintain that object-oriented consists of ... and multiple inheritance.
10. The evolution of C++ has been a ... process.

Exercise 3. Tell what sentences are true, what are false.

1. The ++ suffix has become a synonym for object-orientation.
2. C++ does not differ from other object-oriented languages in many ways.
3. C++ is a root-based language, it operates on a runtime virtual machine.
4. The legacy C code can be combined seamlessly with new C++ code.
5. Migration from C to C++ forces you to throw away good, functional C code.
6. C++ and C code can't work together.
7. There is a universal consensus as to what OO really is; the definitions are similar among schools, languages, and users.
8. C++ today is very different from what it was in 1983, when it was first named «C++».
9. Some of the extensions have radically changed programming styles and concepts of «C++».
10. Programmers who learned C++ only three or five years ago and have caught up with its extensions.

Exercise 4. Complete the sentences.

1. Since 1983 the ++ suffix has become a synonym for
2. C++ is not a root-based language, nor does it operate on
3. The fact that legacy C code can be combined seamlessly with new C++ code is
4. Many commercial frameworks are built upon legacy C code that is wrapped in
5. In addition to object-oriented programming, C++ supports other useful programming styles, ... – making it a multi-paradigm, general-purpose programming language.
6. Many primitives and fundamental concepts of C++ were inherited from
7. C++ and C code can work together. Under certain conditions, this combination is
8. ... is the most widely used style of programming in C++.
9. The evolution of C++ has been
10. Programmers who learned C++ only three or five years ago and haven't caught up with the extensions often discover that

Exercise 5. Translate into English.

1. Кількість користувачів C++ подвоюється кожні кілька місяців.
2. Об'єктно-орієнтоване програмування є найбільш широко вживаний стиль програмування у C++.
3. Які стилі програмування ти знаєш?
4. Станіслав запитав, коли суфікс ++ був зареєстрований як торгова марка і став синонімом до об'єктного орієнтування?
5. C++ підтримує процедурне програмування, об'єктно-основане програмування і узагальнене програмування.
6. Багато характерних особливостей було додано до C++ з часу її заснування, а деякі старі особливості були модифіковані, заперечені чи повністю видалені з мови.
7. Я впевнений, що коди C++ і C можуть

працювати разом. 8. Вона не знала, що немає універсальної згоди щодо визначення об'єктного орієнтування, яке відрізняється з поміж шкіл, мов та користувачів. 9. Програмісти повинні постійно слідкувати за розширеннями C++, щоб мова не висковзнула з поміж їхніх пальців. 10. C++ є потужною, міцною і багатофункціональною мовою програмування сьогодні.

Additional Text (for individual work)

Read and translate the text.

The precursors of object-oriented programming can be traced back to the late 1960's: Classes, inheritance and virtual member functions were integral features of Simula67. A programming language that was mainly used for writing event-driven simulations. When Smalltalk first appeared back in 1972 it offered a pure object-oriented programming environment. In fact Smalltalk defined object-oriented programming. This style of programming was so innovative and revolutionary at the time that it took more than a decade for it to become a standard in the software industry. Undoubtedly, the emergence of C++ in the early 80s provided the most considerable contribution to this revolution.

In 1979 a young engineer at Bell (now AT&T) Labs, Bjarne Stroustrup, started to experiment with extensions to C to make it a better tool for implementing largescale projects. In those days, an average project consisted of tens of thousands of lines of code (LOC).

By adding classes to C, the resultant language – «C with classes» – could offer better support for encapsulation and information hiding. A *class* provides a distinct separation between its internal implementation (the part that is more likely to change) and its external interface. A class object has a determinate state right from its construction, and it bundles together the data and operations that manipulate it.

1. Put questions to the text.

2. Discuss it with your groupmates.

Lesson 17

Read and retell the text:

XML Takes on HTML

Standard Generalized Markup Language (SGML) is the language that spawned both HTML (HyperText Markup Language) and XML (extensible Markup Language). SGML is not a true language, it is a metalanguage, which is a language from which you can create other languages. In this case, it is the creation of a markup language (a system of encoded instructions for structuring and formatting electronic document elements).

HTML is an application-specific derivation of SGML. It is a set of codes, generally used for webpages, that creates electronic documents according to rules established by SGML. HTML is a language that is all about the presentation of your information, not what the actual data is. You can, therefore, say that HTML is a presentation language.

XML is a subset of SGML, but it is also, like SGML, a metalanguage. XML defines a specific method for creating text formats for data so that files are program independent, platform independent, and support internationalisation (able to read different languages, etc.). In fact, because XML is an extensible language, you don't even have to have a browser to interpret the page. Applications can parse the XML document and read the information without any human intervention.

XML, unlike HTML, is concerned with the identity, meaning and structure of data. XML is extensible because it lets website developers create their own set of customised tags for documents. This ability to define your own tags is the main feature of XML, and it is what gives developers more flexibility.

By defining your own markup tags, you can explicitly define the content in the document. This makes XML a more intelligent markup language than HTML. For example, in HTML, you could have a paragraph tag <p> preceding a paragraph about baseball. Your Web browser sees this tag and knows to present the following text as a paragraph. All your browser knows about the text, however, is that it is a text; it doesn't know that it is specifically about baseball. In an XML document, you could define a <BASEBALL> tag to refer specifically to the text in the paragraph in your document. This way, when your XML browser examines the document, the document knows what data it contains, and that makes the content more intelligent. Search engines that make use of XML data can do a better job of finding the pages you are looking for because of the intelligent nature of XML content.

XML, by design, does not deal with how the data is displayed to the end user. Because HTML is a presentation language, XML documents use HTML tags to help handle the visual formatting of the document. Also, you can use XML in your HTML documents to provide metadata, which is data about data in the document.

XML will do to the Web and e-commerce what HTML originally did to the Internet. XML and its associated applications have the potential to blow the roof off the Internet and how we do business.

Vocabulary:

XML (Extensible Markup Language) – розширена мова розмітки (гіпертексту), мова XML;

HTML (Hypertext Markup Language) – мова гіпертекстової розмітки, мова розмітки гіпертексту, мова HTML;

SGML (Standard Generalized Markup Language) – стандартна мова узагальненої розмітки (опису документів), формат та мова SGML;

to spawn – створювати;

application-specific – пов'язаний з (конкретним) застосуванням, спеціалізований;

subset – підмножина;
 to parse – аналізувати, розбирати;
 customised – зроблений на замовлення;
 tag – ТЕГ, керуючий код;
 search engine – пошуковий механізм, пошукова машина, пошукова служба,
 explicitly – ясно, точно.

Comprehensive Questions

1. What languages were derived from SGML?
2. What type of language is used to structure and format elements of a document?
3. Name two metalanguages.
4. What elements of data is XML (but not HTML) concerned with?
5. What is meant by the term “extensible”?
6. What makes XML a more intelligent language than HTML?
7. What does the HTML markup tag <p> indicate?
8. Why are search engines able to do a better job with XML documents?
9. What type of website is particularly likely to benefit from XML?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

Document, code, electronic, information, method, format, file, program, platform, internationalisation, browser, structure, website, tag, paragraph, baseball, visual, Internet, business.

Exercise 2. Give the English equivalents for the following word combinations.

Створювати інші мови; система кодованих інструкцій; елементи електронного документа; створення текстових форматів; інтерпретувати (перетворити) сторінку; детально визначати зміст документа; інтелектуальний мова розмітки; ТЕГ (керуючий код) абзацу; використовувати дані мови XML; знаходження сторінок, які ви шукаєте; управляти візуальним форматуванням; надавати дані.

Exercise 3. Match the terms in A with the statements in B.

A	B
1) Metadata	1) Extensible markup language
2) Metalanguage	2) A coding system used for structuring and formatting documents
3) HTML	3) Data about data
4) XML	4) An example of a page presentation language
5) Markup language	5) A language from which you can create other languages

Exercise 4. Agree or disagree with the following statements.

1. HTML is no longer useful for creating webpages.
2. SGML is more complex than XML.
3. XML files can only be used on Unix systems.
4. XML files can only be read by browser programs.
5. HTML is a markup language.
6. Internet searches will be better with XML files.

Exercise 5. Fill in the blanks with the Gerunds from the box.

creating finding formatting (2) structuring

1. It is the creation of a markup language (a system of encoded instructions for ... and ... electronic document elements).
2. XML defines a specific method for ... text formats for data.
3. Search engines can do a better job of ... the pages you are looking for.
4. XML documents use HTML tags to help handle the visual ... of the document.

Exercise 6. Fill in the table with Participles.

<i>Infinitive</i>	<i>Participle I</i>	<i>Participle II</i>
to associate		
to customise		
to define		
to encode		
to establish		
to follow		
to precede		
to spawn		
to use		

Exercise 7. State questions to the underlined words.

1. In fact, because XML is an extensible language, you don't even have to have a browser to interpret the page. (2)
2. Applications can parse the XML document and read the information without any human intervention.
3. XML is concerned with the identity, meaning and structure of data. (2)

Exercise 8. Talking point.

1. Advantages of XML over HTML.

**Additional Text
(for individual work)**

Read and translate the text.

Hypertext Markup Language (HTML) is a language but it should be interpreted by a hypertext reader (Navigator, Internet Explorer, Grail, Arena, Lynx, Opera, Powerbrowser, Netcruiser, and so forth). JavaScript and VBScript are languages that stand between Perl and HTML. But they perform only a limited set of tasks. In order to create a fully functional and dynamic Web-page environment, one must use a combination of languages. So we can call a *language* any set of instructions that can perform more than simple display processes, dynamically and without user intervention (that is, any set of instructions that could potentially automate a task.)

In contrast, an *extension* is any set of instructions, declarations, or statements that formulate one application of a particular language. Most commonly, the term *extension* refers to HTML extensions. For example, tables in HTML are extensions. They are statements that alter the face of a Web page. The use of tables is becoming more common because tables provide control of the Web page's appearance. Perhaps the easiest way to grasp the concept of extensions is to understand that they are statements that extend the originally intended implementation HTML.

1. Put the questions to the text.
2. Discuss it with your groupmates.

Lesson 18

Read and translate the text:

Computer Graphics

Computer graphics is the field that deals with display and control of images on the computer screen. Applications may be broken down into four major categories: (1) **design** (**computer-aided design** [CAD] systems), in which the computer is used as a tool in designing objects ranging from automobiles to bridges to computer chips by providing an interactive drawing tool and an interface to simulation and analysis tools for the engineer; (2) **fine arts**, in which artists use the computer screen as a medium to create images of impressive beauty, cinematographic special effects, animated cartoons, and television commercials; (3) **scientific visualization**, in which simulations of scientific events such as the birth of a star or the development of a tornado – are exhibited pictorially and in motion so as to provide far more insight into the phenomena than would tables of numbers; and (4) **human-computer interfaces** which enable users to communicate with the computer by such simple means as pointing to an icon with a handheld device known as a mouse, have allowed millions of ordinary people to control application programs like spreadsheets and word processors. Graphics technology also supports windows (display boxes) environments on the workstation or personal computer screen, which allow users to work with different applications simultaneously, one in each window. Graphics also provides realistic interfacing to video games, flight simulators, and other simulations of reality and

fantasy. The term virtual reality has been coined to refer to interaction with a computer- simulated virtual world.

A challenge for computer science has been to develop algorithms for manipulating the myriad lines, triangles, and polygons that make up a computer image. In order for realistic on-screen images to be generated, the problems introduced in approximating objects as a set of planar units must be addressed. Edges of objects are smoothed so that the underlying construction from polygons is not visible, and representations of surfaces are textured. In many applications, still pictures are inadequate, and rapid display of real-time images is required. Both extremely efficient algorithms and state-of-the-art hardware are needed to accomplish such real-time animation. Technical details of graphics displays are discussed in computer graphics.

Vocabulary:

Control of images – контроль за зображенням,
computer screen – монітор комп'ютера,
to exhibit pictorially – показувати, демонструвати графічно,
drawing tools – інструментальні засоби малювання,
a handheld device – портативний пристрій,
computer science – інформатика,
textured – структурний,
flight simulators – авіа-тренажери,
application – застосування, додаток,
to interface – взаємодіяти,
application programs – прикладні програми.

Comprehensive Questions

1. What does computer graphics deal with?
2. How many categories may applications be broken down?
3. How is a computer used in the design?
4. How is computer screen used in fine arts by artists?
5. What is exhibited pictorially in the scientific visualization?
6. How is graphics-based computer interfaces enable users to communicate with the computer?
7. What does graphics technology support?
8. Why has the term “virtual reality” been coined?
9. How has a challenge for computer graphics been developed?
10. Where are technical details of graphics discussed?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

To deal with, computer-aided design [CAD] systems, providing an interactive drawing tool, an interface to simulation and analysis, cinematographic special effects, to provide far more insight into the phenomena, realistic interfacing to

video games, reality and fantasy, a computer-simulated virtual world, to be generated.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|--|-----------------------------|
| 1. Computer graphics is the field that deals with display and on the computer screen. | 1. inadequate |
| 2. Computer graphics is used in design as a tool in | 2. graphics technology |
| 3. Artists use as a medium to create images of impressive beauty. | 3. scientific visualization |
| 4. Simulations of scientific events in are exhibited pictorially and in motion. | 4. to communicate |
| 5. Graphics-based computer interfaces enable users ... with the computer as pointing to an icon with a mouse. | 5. computer screen |
| 6. supports windows environments on the personal computer screen. | 6. graphics |
| 7. ... provides realistic interfacing to video games, flight simulators, and other simulations of reality and fantasy. | 7. technical details |
| 8. The term virtual reality has been coined to refer to ... with a computer-simulated virtual world. | 8. interaction |
| 9. In many applications, still pictures are ..., and rapid display of real-time images is required. | 9. control of images |
| 10. of graphics displays are discussed in computer graphics. | 10. designing objects |

Exercise 3. Tell what sentences are true, what are false.

1. Programming is the field that deals with display and control of images on the computer screen. 2. Applications may be broken down into four major categories: design, fine arts, scientific visualization and human-computer interfaces. 3. Design is used as a tool in designing different objects by providing an interactive drawing tool and an interface to simulation and analysis tools for the engineer. 4. Programmers use the computer screen as a medium to create images of impressive beauty, cinematographic special effects, animated cartoons, and television commercials in fine arts. 5. Graphics technology allows users to work with different application programs simultaneously, one in each window. 6. Graphics-based computer interfaces have allowed millions of ordinary people to work with application programs like spreadsheets and word processors. 7. Graphics also provides realistic interfacing to video games, flight simulators, and other simulations of reality and fantasy. 8. The term scientific visualization has been coined to refer to interaction with a computer-simulated virtual world. 9. A challenge for computer science has been to develop algorithms for manipulating

the myriad lines, triangles, and polygons that make up a computer image. 10. Technical details of graphics displays are discussed in computer science.

Exercise 4. Translate into English.

1. Комп'ютерна графіка – це галузь, яка має справу з відображенням і контролем за відображеннями на екрані комп'ютера. 2. Комп'ютерна графіка забезпечує реалістичну взаємодію з відеоіграми, авіа-тренажерами і відворенням реальності чи фантастики. 3. Комп'ютерна графіка є галуззю інформатики. 4. Застосування комп'ютерної графіки може бути поділене на 4 основні категорії: проектування, прикладне мистецтво, наукове відображення (візуалізація), взаємодія людини і комп'ютера. 5. Художники використовують екран комп'ютера як засіб для створення зображень надзвичайної краси, кінематографічних спецефектів та мультиплікаційних фільмів. 6. Наукові події відтворюються і демонструються графічно і в русі через наукову візуалізацію. 7. Незлічувані лінії, трикутники і багатокутники допомагають створювати комп'ютерне зображення. 8. Графічна технологія підтримує середовища вікон на екрані ПК, які дозволяють користувачам працювати з різними додатками одночасно в кожному вікні. 9. Він знав, що всі технічні деталі графічних відображень обговорюються в комп'ютерній графіці. 10. Такий портативний пристрій як мишка дозволяє мільйонам звичайних людей контролювати прикладні програми як електронні таблиці і текстові редактори.

Lesson 19

Read and retell the text:

Microsoft Company

Microsoft is the best-known American company involved in software production. Microsoft's wealth and power is growing up for years. It is a giant company. Microsoft's 25\$ billion market value tops that of Ford, General Motors.

Paul Allen and Bill Gates founded the Microsoft Company in 1975.

Some time ago, Microsoft dominated the PC market with its MS-DOS operating system, the basic software that let the computer understand your commands and carry them out, appeared in the beginning of 80s. MS-DOS ran on 90 percent of the world IBM and IBM-clone computers. Then, Microsoft has extended that presence with releasing of Windows which is probably the most important and popular operating system in the world. And now it dominates the market.

Firstly, Microsoft released Windows' 95 in 1995. It was a graphic interface environment that ran on top of MS-DOS and replaced DOS in future versions. Then, Microsoft released Windows' 98, Windows Millennium, Windows 2000 and Windows XP.

Microsoft also supplies about 50 percent of the world's software applications. Among them, there are three well-known Office Packs; they are also

called Microsoft Office programs such as Excel (spreadsheets), Microsoft Word (word processing), Access (data bases) and Outlook Express (e-mail). There were released in 1997, 2000, and 2002 when appeared Microsoft Office XP. Microsoft is also in the market of networking, multimedia and even books. And as an early supporter of the Macintosh computer, Microsoft virtually owns the Mac application market.

It has been calculated that Microsoft controls 80-85% of the entire PC software industry. The company has hundreds of products and thousands of employees, making it one of the largest companies. Many of the company's shareholders are now millionaires and a few including Bill Gates and Paul Allen are billionaires. Microsoft is no doubt the fastest growing company in the PC software industry.

Vocabulary:

To release – випускати,

to carry out – виконувати,

spreadsheets – програма табличних обчислень,

word processing – текстовий редактор,

networking – організація/створення мереж,

entire – цілий, весь,

an application – програма,

a shareholder – акціонер,

billionaire – мільярдер.

Comprehensive Questions

1. What is the best-known American company involved in software production?
2. Who founded the company?
3. When was Microsoft founded?
4. What does the company produce?
5. What was the first Microsoft operating system that dominated the PC market?
6. When was Windows' 95 released?
7. How many Windows operating systems did Microsoft release?
8. What software applications does Microsoft supply?
9. How many percent of the PC software industry does Microsoft control?
10. Why has Microsoft frequently had to defend its business practices in the US courts?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

To be involved in software production, Microsoft's wealth and power, a giant company, popular operating system, the world's software applications, the market of networking, the company's shareholders, word processing, the entire PC software industry, the fastest growing company.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|--|------------------------------|
| 1. Microsoft is best-known American company involved in | 1. released |
| 2. Paul Allen and Bill Gates ... the Microsoft Company in 1975. | 2. Microsoft Office programs |
| 3. MS-DOS operating system is appeared in the beginning of 80s. | 3. software industry |
| 4. Windows is the most important and popular in the world. | 4. shareholders |
| 5. Microsoft ... Windows' 95 in 1995. | 5. software applications |
| 6. Microsoft supplies about 50 percent of the world's. | 6. the fastest growing |
| 7. There are three well-known Office Packs which are called | 7. founded |
| 8. Microsoft controls 80-85% of the entire PC | 8. software production |
| 9. Many of the company's ... are now millionaires and billionaires. | 9. operating system |
| 10. Microsoft is no doubt company in the PC software industry. | 10. the basic software |

Exercise 3. Tell what sentences are true, what false.

1. Microsoft is best-known American company involved in hardware production. 2. Paul Allen and Bill Gates founded the Microsoft Company in 1975. 3. MS-DOS ran on 60 percent of the world IBM and IBM-clone computers. 4. Windows is the most important and popular operating system in the world. 5. The basic software that let the computer understand your commands and carry them out, appeared in the beginning of 90s. 6. Firstly, Microsoft released Windows' 95 in 1995. 7. Microsoft also supplies about 50 percent of the world's hardware applications. 8. Microsoft is also in the market of networking, multimedia and even books. 9. Microsoft controls 80-85% of the entire PC software industry. 10. Microsoft is no doubt the fastest growing company in the PC software industry.

Exercise 4. Translate into English.

1. Компанія Майкрософт – це гігантська компанія, багатство і влада якої зростає з кожним роком. 2. Майкрософт – найкраще відома американська компанія, яка задіяна у виробництві програмного забезпечення. 3. Він не знав, що компанія Майкрософт була заснована у 1975 році. 4. Майкрософт розширилась, випустивши операційну систему Віндоуз. 5. Віндоуз – найважливіша і найпопулярніша операційна система в світі, яка зараз домінує на ринку. 6. Майкрософт, найбільша компанія, яка контролює 85% всієї програмної промисловості персональних комп'ютерів. 7. Багато акціонерів компанії Майкрософт є мільйонерами, а Пол Аллен і Біл Гейц – мільяртери. 8. Вона не знала, що компанія Майкрософт є також на ринку створення мереж, мультимедійних засобів і навіть книг. 9. Є три добре відомих офісних пака, які називаються офісними програмами Майкрософт.

10. Майкрософт є без сумніву найшвидше зростаюча компанія на ринку програмного забезпечення персональних комп'ютерів.

**Additional Text
(for individual work)**

Read and translate the text.

In 2001 Windows XP becomes one of the best-selling products in the coming years. It's both fast and stable. Awareness of computer viruses and hackers increases, but fears are to a certain extent calmed by the online delivery of security updates. Consumers begin to understand warnings about suspicious attachments and viruses. There's more emphasis on Help and Support. Windows XP Home Edition offers such enhancements as the Network Setup Wizard, Windows Media Player, Windows Movie Maker, and enhanced digital photo capabilities. With a fresh visual design, Windows XP Professional includes features for business and advanced home computing, including remote desktop support, an encrypting file system, and system restore and advanced networking features. Windows XP has several editions during these years: Windows XP 64-bit Edition (2001), Windows XP Media Center Edition, Windows XP Tablet PC Edition (2002).

Windows Vista is released in 2006 with the strongest security system yet. User Account Control helps to prevent potentially harmful software from making changes to your computer. Windows Vista also features enhancements to Windows Media Player. Here you can watch television, view and send photographs and edit videos.

By the late 2000s, the wireless world has arrived. When Windows 7 is released in October 2009, laptops are outselling desktop PCs and it's common to get online at public wireless hotspots like coffee shops. Wireless networks can be created at the office or at home. Windows Touch through photos, and open files and folders. You can stream music, videos, and photos from your PC to a stereo or TV. Many laptops no longer have a slot for DVDs and some have solid state drives rather than conventional hard disks. Most everything is streamed, saved on flash drives, or saved in the "Cloud" – an online space for sharing files and storage. Windows Live – free programs and services for photos, movies, instant messaging, e-mail, and social networking – is seamlessly integrated with Windows so that you can keep in touch from your PC, phone, or the web, extending Windows to the Cloud.

Meanwhile, work is underway for the next version of Windows.

- 1. Put questions to the text.**
- 2. Discuss it with your groupmates.**

Lesson 20

Read and translate the text:

Internet and Modern Life

The Internet has already entered our ordinary life. Everybody knows that the Internet is a global computer network, which embraces hundreds of millions of users all over the world and helps us to communicate with each other.

The history of Internet began in the United States in 1969. It was a military experiment, designed to help to survive during a nuclear war, when everything around might be polluted by radiation and it would be dangerous to get out for any living being to get some information to anywhere. Information sent over the Internet takes the shortest and safest path available from one computer to another. Because of this, any two computers on the net will be able to stay in touch with each other as long as there is a single route between them. This technology was called packet switching.

Invention of modems, special devices allowing your computer to send the information through the telephone line, has opened doors to the Internet for millions of people whose number is growing with every day.

Nowadays the most popular Internet service is e-mail. Most of the people use the network only for sending and receiving e-mail messages. They can do it either they are at home or in the internet clubs or at work.

Another common service of the Internet is the Internet Relay Chat, or Chat. Chat allows a group of people, using aliases, to send messages to one another immediately. While used by a variety of age groups, it is especially popular among young people. Once connected, the user is brought into contact with a large number of users from all around the world.

The World Wide Web or the Web is the leading information retrieval service of the Internet. The Web gives users access to a vast array of documents that are connected to each other by means of hypertext or hypermedia links.

Other popular services are available on the Internet too. It is reading news, available on some dedicated news servers, telnet, FTP servers, etc.

In many countries, the Internet could provide businessmen with a reliable, alternative to the expensive and unreliable telecommunications systems its own system of communications. Commercial users can communicate cheaply over the Internet with the rest of the world. When they send e-mail messages, they only have to pay for phone calls to their local service providers, not for international calls around the world, when you pay a good deal of money.

But saving money is only the first step and not the last one. There is a commercial use of this network and it is drastically increasing. Now you can work through the internet, gambling and playing.

However, there are some problems. The most important problem is security. When you send an e-mail, your message can travel through many different networks and computers. The data is constantly being directed towards its destination by special computers called routers. Because of this, it is possible to get into any of the computers along the route, intercept and even change data being sent over the Internet. But there are many encoding programs available. Notwithstanding, these programs are not perfect and can easily be cracked.

Another big and serious problem of the net is control. Yes, there is no effective control in the Internet, because a huge amount of information circulating through the net. It is like a tremendous library and market together. In the future, the situation might change, but now we have what we have.

Vocabulary:

Packet switching – пакетне переключення,
dedicated – спеціально призначений,
drastically – швидкий темп,
Relay Chat – оперативний обмін текстовими повідомленнями,
FTP servers – (File Transfer Protocol) ФТП-сервер,
alias – псевдонім,
retrieval service – служба доступу до баз даних з підтримкою їх вибірки,
to intercept – перехопити (сигнал),
to encode – кодувати, шифрувати,
notwithstanding – проте, однак,
to crack – зламати.

Comprehensive Questions

1. What is the Internet?
2. When and where did the history of Internet begin?
3. Why was the Internet designed?
4. What is modem?
5. Where are most of the Internet host computers?
6. What is the accurate number of Internet users?
7. What is the most popular Internet service today?
8. What are other popular available on the Internet?
9. What is the most important problem of the Internet?
10. Why is there no effective control in the Internet today?
11. Is there a commercial use of the network today?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

A global computer network, a military experiment, to survive during a nuclear war, the shortest and safest path, sending and receiving e-mail messages, unreliable telecommunications systems, drastically increasing, intercept and change data, travel through many different networks, many encoding programs.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|--|--------------------------|
| 1. The Internet is a ... which embraces
hundreds of millions of users. | 1. drastically |
| 2. The Internet was ... designed to help
to survive during a nuclear war. | 2. perfect, cracked |
| | 3. a military experiment |
| | 4. alias |

- | | |
|---|----------------------------------|
| 3. Information sent over the Internet takes ... available from one computer to another. | 5. work, play |
| 4. Nowadays the most popular Internet service is ... | 6. security |
| 5. Chat allows a group of people, using ..., to send messages to one another immediately. | 7. e-mail |
| 6. ... can communicate cheaply over the Internet with the rest of the world. | 8. a global computer network |
| 7. The commercial use of the Internet is ... increasing. | 9. commercial use |
| 8. You can ... and ... through the Internet. | 10. the shortest and safest path |
| 9. The most important problem is ... | |
| 10. Many encoding programs are available, but they are not ... and can be easily ... | |

Exercise 3. Tell what sentences are true, what are false.

1. The Internet has not entered our ordinary life yet. 2. The Internet emerged in Great Britain in the 1970s. 3. Everybody knows exactly how many people use the Internet today. 4. People can send or receive e-mail messages only at the internet clubs. 5. Chat allows a group of people, using aliases, to send messages to one another immediately. 6. Chat is especially popular among the adult people. 7. The World Wide Web or the Web is the leading information retrieval service of the Internet. 8. Other popular services available on the Internet are reading news, telnet, FTP servers, etc. 9. Encoding programs are not perfect and can easily be cracked. 10. The Internet is like a tremendous library and market together.

Exercise 4. Translate into English.

1. Інтернет допомагає користувачам спілкуватися один з одним. 2. Всі знають, що Інтернет – це глобальна комп'ютерна мережа, яка охоплює сотні мільйони користувачів по всьому світу. 3. Комерційне використання Інтернету зростає швидким темпом. 4. Більшість людей використовує мережу для надсилання і отримання електронних повідомлень. 5. Мережа – це величезна бібліотека, де кожен може знайти будь-яку необхідну інформацію. 6. Я впевнений, що Інтернет допоміг би людям вижити в ході ядерної війни, коли б все було забруднене радіацією. 7. Багато незакодованих програм є не бездоганними, і можуть бути зламані. 8. Не можливо уявити сучасне життя без Інтернету. 9. Кількість користувачів Інтернету зростає швидким темпом з кожним днем. 10. Вона не знала, що немає ефективного контролю в Інтернеті через циркуляцію великої кількості інформації.

**Additional Text
(for individual work)**

Read and translate the text.

Today's World Wide Web presents an ever-diversified experience of multimedia, programming languages, and real-time communication. It is a challenge to keep up with the rapid pace of developments.

Multimedia. The web has become a broadcast medium. It is possible to listen to audio and video over the web, both pre-recorded and live. For example, you can visit the sites of various news organizations and view the same video shown on the nightly television news. Several plugins are available for viewing these videos. For example, Apple's Quick Time Player downloads files with the move extension and displays these as "movies" in a small window on your computer screen. Quick Time files can be quite large, as it may take patience to wait for the entire movie to download into your computer before you can view it.

The problem of slow download times has been answered by a revolutionary development in multimedia capability: streaming media. In this case, audio or video files are played as they are downloading, or streaming into your computer. Only a small wait, called buffering, is necessary before the file begins to play. The RealPlayer plug-in plays streaming audio and video files. Extensive files such as interviews, speeches and hearings work very well with RealPlayer. The RealPlayer is also ideal for the broadcast of real-time events. These may include press conferences, live radio and television broadcasts, concert, etc.

Sound files, including music, may also be heard on the Web. It is not uncommon to visit a Web page and hear background music.

Live cams are another aspect of the multimedia experience available on the Web. Live cams are video cameras that send their data in real time to a Web server. These cams may appear in all kinds of locations, such as an office, on top of a building, a scenic locale, a special event, and so on. Text, audio and video communication can occur in real time on the Web. This capability allows people to conference and collaborate in real time. In general, the faster the Internet connection, the more successful the experience.

1. Put the questions to the text.

2. Discuss it with your groupmates.

Lesson 21

Read and translate the text:

Understanding the World Wide Web

The World Wide Web was developed in 1989 by Tim Berners-Lee of the European Particle Physics Lab (CERN) in Switzerland. The initial purpose of the Web was to use networked hypertext to facilitate communication among its members, who were located in several countries. Word was soon spread beyond CERN, and a rapid growth in the number of both developers and users ensued. In addition to hypertext, the Web began to incorporate graphics, video, and sound. In

recent years, the use of the Web has now reached global proportions. Almost every protocol type available on the Internet is accessible on the Web. *Internet protocols* are sets of rules that allow for intermachine communication on the Internet. The following major protocols are accessible on the Web:

E-mail (Simple Mail Transport Protocol or SMTP) distributes electronic messages and files to one or more electronic mailboxes.

Telnet (Telnet Protocol) facilitates login to the computer host to execute commands.

FTP (File Transfer Protocol) transfers text or binary files between an FTP server and client.

Usenet (Network News Transfer Protocol or NNTP) distributes Usenet news articles derived from topical discussions on newsgroups.

HTTP (Hyper Text Transfer Protocol) transmits hypertext over networks. This is the protocol of the WWW.

Many other protocols are available on the Web. To name just one example, the Voice over Internet Protocol (VOIP) allows users to place a telephone call over the Web.

The World Wide Web provides a single interface for accessing all these protocols. This creates a convenient environment. It is no longer necessary to be onversant in these protocols within separate, commandlevel environments. The web gathers together these protocols into a single system. Because of this feature, and because of the web's ability to work with multimedia and advanced programming languages, the World Wide Web is the fastest-growing component of the Internet.

Vocabulary:

Hypertext – гіпертекст (текст для перегляду на комп'ютері, який містить зв'язки з іншими документами («гіперзв'язки» чи гіперпосилання)),

growth – зростання,

to ensue – виникати, відбуватися,

to incorporate – об'єднувати, приєднувати,

to distribute – розподіляти,

computer host – ведучий комп'ютер,

electronic mailbox – електронна поштова скринька,

to facilitate – полегшити,

to execute commands – виконувати команди,

binary files – бінарні файли,

Telnet Protocol – мережевий протокол для реалізації текстового інтерфейсу по мережі,

Usenet (Network News Transfer Protocol or NNTP) – протокол передачі новин у інтернет-мережі,

FTP (File Transfer Protocol) – протокол передачі файлів,

E-mail (Simple Mail Transport Protocol (SMTP) – протокол передачі електронної пошти,

HTTP (Hyper Text Transfer Protocol) – протокол передачі гіпертексту,

Voice over Internet Protocol (VOIP) – голосовий інтернет-протокол,

to be conversant – бути обізнаним, бути поінформованим.

Comprehensive Questions

1. What are the abilities of the World Wide Web?
2. Why has the use of the Web now reached global proportions?
3. What are the Internet protocols?
4. What protocols are accessible on the Web?
5. Why does the World Wide Web provide a single interface?
6. What is the fastest growing component of the Internet and why?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

Particle Physics, the initial purpose, to facilitate communication, both developers and users, to reach global proportions, intermachine communication, topical discussions, a convenient environment, command-level environments, advanced programming languages, the fastest-growing component.

Exercise 2. Give Ukrainian equivalents of the following.

Початкова мета, сучасні мови програмування, досягати глобальних пропорцій, полегшити зв'язок, фізика елементарних частин, як і розробники так і користувачі, компонент, який найшвидше розвивається, тематичні обговорення, міжмашинний зв'язок, сприятливе середовище, середовище командного рівня.

Exercise 3. Tell what sentences are true, what false.

1. The World Wide Web was developed in 1998 in Scotland? 2. The Web can incorporate graphics, video, and sound. 3. All types of protocols available on the Internet are accessible on the Web. 4. VOIP allows users to perform on-line communication over the Web. 5. The web divides all the protocols into several separate systems. 6. The World Wide Web is the fastest-growing component of a computer.

Exercise 4. Choose the right answer.

1. Who developed the World Wide Web?
 - a). Bill Gates;
 - b). J.Eckert and J.Maushly;
 - c). Tim Berners-Lee.
2. Why do we use networked hypertext?
 - a). to facilitate surfing a net;
 - b). to facilitate communication;
 - c). to facilitate searching information.
3. What are internet protocols?
 - a). sets and rules;
 - b). programming languages;
 - c). binary files.
4. What is the function of E-mail?

- a). incorporation of graphics;
 - b). distribution of electronic messages;
 - c). intermachine communication.
5. What is Usenet?
- a). Simple Mail Transport Protocol;
 - b). File Transfer Protocol;
 - c). Network News Transfer Protocol.
6. What does HTTP transmit?
- a). Internet protocols;
 - b). hypertext;
 - c). mass communication.

Exercise 5. Complete the sentences.

1. The World Wide Web was developed in 2. Internet protocols are 3. Simple Mail Transport Protocol distributes 4. Telnet protocol facilitates 5. NNTP distributes 6. Hyper Text Transfer Protocol transmits 7. Voice over Internet Protocol allows 8. The World Wide Web provides a single 9. The World Wide Web is the fastest

Exercise 6. Match the words in A with their synonyms in B.

A	B
purpose	paper
country	quick
to begin	to permit
to incorporate	to make
every	aim
set	state
to allow	to start
article	each
to create	to unite
fast	kit

Exercise 7. Fill in the gaps with the words from Vocabulary Notes in the appropriate form.

Network / transfer / hypertext / digital / FTP / servers / protocol

1. Electronic mail, commonly called e-mail, is a method of exchanging ... messages from an author to one or more recipients. 2. Telnet is a network ... used on the Internet or local area networks to provide a bidirectional interactive text-oriented communications facility using a virtual terminal connection. 3. File Transfer Protocol is a standard network protocol used to ... files from one host to another host over the Internet. 4. ... is built on a client-server architecture and utilizes separate control and data connections between the client and server. 5. Usenet is one of the oldest computer ... communications systems conceived in 1979 and publicly established in 1980 at the University of North Carolina. 6. The HTTP protocol is designed to permit intermediate network elements to improve or enable communications between

clients and 7. One of the main feature of the WWW documents is their ... structure.

Exercise 8. Translate into English.

1. Спочатку всесвітню світову мережу використовували для того, щоб полегшити спілкування між людьми в різних країнах. 2. Сьогодні Інтернет мережа об'єднує графіку, відео та звук. 3. Протокол передачі гіпертексту передає гіпертекст по мережі. 4. За допомогою голосового інтернет-протоколу ми можемо здійснювати дзвінки у мережі і безкоштовно спілкуватися з людьми з різних куточків світу. 5. Всесвітня світова мережа об'єднує всі інтернет-протоколи у єдину систему.

Additional Text (for individual work)

Read and translate the text.

Telnet is a program that allows you to log into computers on the Internet and use online databases, library catalogs, chat services and more. To Telnet to a computer, you must know its address. This can consist of words or numbers. Some services require you to connect to a specific port on the computer. In this case, type the port number after the Internet address.

A Telnet program must be installed on your local computer and configured to your Web browser in order to work.

FTP stands for File Transfer Protocol. This is both a program and the method used to transfer files between computers. Anonymous FTP is an option that allows users to transfer files from thousands to host computers on the Internet to their personal computer account. FT sites contain books, articles, software, games, images, sounds, multimedia and others.

Usenet News is a global electronic bulletin board system in which millions of computer users exchange information on a vast range of topics. The major difference between Usenet News and e-mail discussion groups is the fact that Usenet messages are stored on central computers, and users must connect to these computers to read the messages posted to these groups. This is distinct from e-mail distribution in which messages arrive in the electronic mailboxes of each list member. Usenet itself is a set of machines that exchanges messages or articles from Usenet discussion forums called newsgroups. There are thousands of Usenet newsgroups in existence. While many are academic in nature, numerous newsgroups are organized around recreational topics.

1. Put the questions to the text.

2. Discuss it with your groupmates.

Lesson 22

Read and translate the text:

Cybercrimes: Denial of Service Attacks

On February 7, 2000, "mafiaboy," a 15-year-old Canadian hacker, orchestrated a series of "denial of service" attacks (DoS) against several e-commerce sites. These attacks used computers at multiple locations to overwhelm the vendors' computers and shut down their World Wide Web (WWW) sites to legitimate commercial traffic. The attacks crippled Internet commerce, with the FBI estimating that the affected sites suffered \$1.7 billion in damages. In 1988 the Internet played a role only in the lives of researchers and academics; by 2000 it had become essential to the workings of the U.S. government and economy. Cybercrime had moved from being an issue of individual wrongdoing to being a matter of national security.

Distributed DoS attacks are a special kind of hacking. A criminal salts an array of computers with computer programs that can be triggered by an external computer user. These programs are known as Trojan horses since they enter the unknowing users' computers as something benign, such as a photo or document attached to an e-mail. At a predesignated time, this Trojan horse program begins to send messages to a predetermined site. If enough computers have been compromised, it is likely that the selected site can be tied up so effectively that little if any legitimate traffic can reach it. One important insight offered by these events has been that much software is insecure, making it easy for even an unskilled hacker to compromise a vast number of machines. Although software companies regularly offer patches to fix software vulnerabilities, not all users implement the updates, and their computers remain vulnerable to criminals wanting to launch DoS attacks. In 2003 the Internet service provider PSINet Europe connected an unprotected server to the Internet. Within 24 hours the server had been attacked 467 times, and after three weeks more than 600 attacks had been recorded. Only vigorous security regimes can protect against such an environment. Despite the claims about the pacific nature of the Internet, it is best to think of it as a modern example of the Wild West of American.

Vocabulary:

To orchestrate – інструментувати,

to overwhelm – вражати,

to legitimate – узаконити,

traffic – потік повідомлення в мережі передачі даних,

to cripple – приводити в непридатність,

a wrongdoing – злочин,

to salt – закидати, засмічувати

array – маса, безліч

to trigger – пустити в хід, привести в рух,

benign – доброякісний,

at a predesignated time – у заздалегідь визначений час,

to compromise – піддавати ризику,

to tie up – обмежувати свободу дій,

a hacker – користувач обчислювальної системи, який займається пошуком

незаконних способів отримати доступ до захищених даних,
a patch – "латка", зміна, внесена в об'єктну програму у вигляді набору
машинних команд, а не в текст на мові програмування,
vulnerability – уразливість,
implement – виконувати, здійснювати,
update – модернізація,
to launch – запускати,
vigorous security regimes – енергійний режим безпеки.

Comprehensive Questions

1. What had moved cybercrime to being a matter of national security?
2. What does DoS stand for? Give its definition.
3. How can computer be affected by an external computer user?
4. Is it easy to compromise a vast number of machines?
5. How can software vulnerabilities be fixed?
6. Why do many computers remain vulnerable to criminals wanting to launch DoS attacks?
7. Is the Internet nature pacific?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

A series of "denial of service" attacks, to overwhelm the vendors' computers, to legitimate commercial traffic, an issue of individual wrongdoing, a matter of national security, a special kind of hacking, Trojan horse program, to compromise a vast number of machines, to implement the updates, an unprotected server.

Exercise 2. Complete the sentences using the information of the text.

1. DoS attacks are a
2. Cybercrime had moved to being
3. A criminal salts an array of computers with computer programs that
4. Trojan horse program enter the unknowing users' computers as
5. Software companies regularly offer
6. Only vigorous security regimes can
7. Criminals launch DoS attacks to
8. It is best to think of the Internet as a
9. In 1988 the Internet was important only for
10. By 2000 the Internet had become essential to

Exercise 3. Fill in the gaps in the passage below with the words from the box in the appropriate form.

software vulnerability	insecure	DoS attack
update	protect	
cybercrime (x 2)		

Rapid evolution of the Internet has changed its role in the life of the society. It resulted in ... increase. DoS attacks are a special kind of One important insight have been that much software is ... because not all users implement the So it is

a matter of national security now to fix Only vigorous security regimes can ... computers against

Exercise 4. Translate into English.

1. Я не знав, що ця програма може привести у непридатність цей комерційний сайт. 2. Кіберзлочини стали справою національної безпеки. 3. Я думаю, що багато програмного забезпечення є ненадійним. 4. Не всі користувачі здійснюють модернізацію їхніх комп'ютерів, і вони залишаються чутливими до злочинних програм. 5. Хакери засмічують безліч комп'ютерів комп'ютерними програмами, які є небезпечними для всіх комп'ютерів. 6. Програма «Троянський кінь» піддає ризику твій комп'ютер. 7. Вам необхідно використати енергійний режим безпеки, щоб захистити свій ПК. 8. Програма «Троянський кінь» входить у ваш комп'ютер, як фото чи документ прикріплений до електронної пошти. 9. Я не знаю, що може допомогти відхилити сервісні атаки. 10. Інтернет сьогодні відіграє важливу роль у житті кожного.

Lesson 23

Read and translate the text:

Cybercrimes: Spam

E-mail has spawned one of the most significant forms of cybercrime - spam, or unsolicited advertisements for products and services, which experts estimate to comprise roughly 50 percent of the e-mail circulating on the Internet. Spam is a crime against all users of the Internet since it wastes both the storage and network capacities of ISPs, as well as often simply being offensive. Yet, despite various attempts to legislate it out of existence, it remains unclear how spam can be eliminated without violating the freedom of speech in a liberal democratic polity. Unlike junk mail, which has a postage cost associated with it, spam is nearly free for perpetrator ... it typically costs the same to send 10 messages as it does to send 10 million—and some of the most prolific originating states for spammers (particularly China) have been slow to act.

E-mail also serves as an instrument for both criminals and terrorists. While libertarians laud the use of cryptography to ensure privacy in communications, criminals and terrorists may also use cryptographic means to conceal their plans. Law-enforcement officials report that some terrorist groups embed instructions and information in images via a process known as steganography, a sophisticated method of hiding information in plain sight.

Even recognizing that something is concealed in this fashion often requires considerable amounts of computing power; actually decoding the information is nearly impossible if one does not have the key to separate the hidden data.

Vocabulary:

Cyber – відноситься до комп'ютерів, інформаційних технологій, Інтернету,
to spawn – народжувати (винаходити),

spam – спам, масова розсилка реклами електронною поштою,
 unsolicited – наданий добровільно,
 to estimate – оцінювати, встановлювати вартість,
 to comprise – включати, містити,
 to circulate – циркулювати,
 to waste – розтрачувати,
 to legislate – узаконювати,
 to eliminate – усувати,
 to violate – порушувати,
 a polity – держава,
 junk mail – «макулатурна» пошта (реклама, запрошення),
 a post cost – поштові витрати,
 a perpetrator – правопорушник, злочинець,
 privacy – секретність, конфіденційність,
 to conceal – приховувати,
 to embed – вставляти,
 cryptography – криптографія (від cryptos – таємний) мистецтво і технологія
 забезпечення таємності важливої інформації і методів захисту її від змін та
 неавторизованого доступу при передачі по каналах зв'язку або зберіганні,
 steganography – стеганографія (грец. "тайнопис") – набір засобів і методів
 приховування факту передачі повідомлення, напр., кодування повідомлення
 у графічних і звукових файлах,
 sophisticated – складний, модернізований,
 law-enforcement – правоохоронний,
 considerable – значний, істотний,
 to decode – розшифровувати,
 to ensure – забезпечувати,
 via – через,
 in plain sight – неозброєним оком.

Text Study

Exercise 1. Read the text again. Find the sentences containing the word combinations given below and translate them.

E-mail circulating on the Internet, storage and network capacities, legislate spam out of existence, eliminate spam, ensure privacy in communications, cryptographic means, embed instructions and information in images, a sophisticated method of hiding information, considerable amounts of computing power, decode information, hidden data.

Exercise 2. Choose the necessary word and put it in the sentence.

- | | |
|---|---------------------------------------|
| 1. E-mail has spawned one of the most significant forms of cybercrime | 1. steganography |
| 2. Spam is a crime against | 2. spam |
| 3. E-mail also serves as | 3. to ensure privacy in communication |
| 4. Criminals and terrorists may also | 4. all users of the Internet |

use cryptographic means

5. to conceal their plans

5. ... is a sophisticated method of hiding information in plain sight.

Exercise 4. Find in the text the English equivalents for the following sentences.

1. Спам – одна з найзначніших форм комп'ютерних злочинів.
2. Спам – добровільне розсилання реклам товарів і послуг.
3. Спам – це правопорушення проти усіх користувачів Інтернету.
4. Спам майже нічого не коштує, (безкоштовний) для правопорушників.

Exercise 5. Say whether these sentences are true or false.

1. Spam wastes the Internet resources.
2. Spam can be eliminated without violating the freedom of speech in a liberal democratic polity.
3. Spam has been spawned by e-mail.
4. Spam has a postage cost.
5. Spam is offensive only for criminals and terrorists.

Ex.6 Find in the text two sentences with the conjunction “both ... and” and translate them.

Ex.7 Read the text again and write down 5 or 6 sentences about the features of spam.

**Additional Text
(for individual work)**

Read and translate the text.

History of SPAMming

SPAM is an unsolicited message in most cases with commercial content. Spamming means sending a message to a lot of email addresses owners of which don't want to receive this message.

The first SPAM was sent as an advertisement through the ARPANET network to 393 recipients in year 1978. The subject of this message signed by David Rhodes was “MAKE MONEY FAST!” (very similar spams are sent till today).

The first really massive spam was the “Green Card Lottery” sent by lawyer Company to about 6000 discuss networks in 1994. The very similar communication was the “Global Alert for All: Jesus is Coming Soon”.

The Czech best-known spam is a massive email by Media Online Company about server Tvujdum.cz: in the body of the email information about news and the web was placed. Later this company apologized for it and let know that they will send 50 000 Czech crowns to the foundation Člověk v tísni (Human in dire straits). But after many people complained about this, Media Online was penalized.

The next spammer was a student Richard Slaby with a spam about cloning a SIM card.

A very known spam is “Hotel U Lípy”: this year Mr. Geyer was penalized, he must pay 250 000 Czech crowns.

There is the law of 1994 against spammers in the Czech Republic. It is important for our country, but as usually it isn't perfect because “look at www.business-offer.cz “ can't be considered as a spam.

Kinds of SPAMs

1. Email spams unwanted email messages. This problem arose when the Internet was opened to the common users.
2. Instant Messaging – “spim” – Instant Messenger, ICQ, Live Messenger, QIP, Miranda...
3. Newsgroup and forum spams, blogs, wiki, guest books spams
4. Mobile phone spams – SpaSMS
5. Video sharing: YouTube links to the malware software.

Statistics

- language: 99% English, next are Japanese, Spanish and Russian
- domain name: .com 66%, .net 13%, .uk 4%
- size: 80% less than 10 kB , 3% more than 30 kB
- theme (subjects): 15% sex (erotic), 10% pharmacy, 8 % software, 5% luxury products (Rolex etc.)
- 80-90% of all emails are spams
- 100 billions spam emails are sent every day
- the company costs in 2007 amounted approximately 250 millions USD
- influence of the first letter of an email address: mostly the addresses beginning with letters A,M,S,R,P are often abused, with Q,Y, Z – less.

How to prevent (chiefly companies) from receiving spams

1. Don't use email addresses in the company's homepage or don't use @ – it is better to write “name zavinac domain.cz” or use a form with a certificate (it is necessary to fill in 4 characters in the form) because spammer robots try to get email addresses from webpages looking for strings with “@”.
2. Don't use the company email in web forms, chats, discuss groups – users should use private email addresses.
3. Use antivirus, firewall, antispymware, update the operating system.
4. Don't use unsafely web addresses and don't download unknown files.
5. Use antispam both on the server and in a local email client (outlook).
6. Configure SMTP server – use only emails to the own domain.

1. Put the questions to the text.

2. Discuss it with your groupmates.

Lesson 24

Read and translate the text:

Computer Viruses

The Maltese Amoeba may sound like a cartoon character, but if it attacked your computer, you wouldn't be laughing. The Maltese Amoeba is a computer virus. It is a form of software which can «infect» your system and destroy your data. Making computer viruses is only one type of computer crime. Others include hacking (changing data in a computer without permission) and pirating (illegally copying software programs).

Viruses are programs which are written deliberately to damage data. Viruses can hide themselves in a computer system. Some viruses are fairly harmless. They may flash a message on screen, such as «Gotcha! Bet you don't know how I crept in.» The Yankee Doodle virus plays this American tune on the computer's small internal speaker every eight days at 5 p.m. Others have serious effects. They attach themselves to the operating system and can wipe out all data or turn it into gobbledegook. When the Cascade virus attacks, all the letters in a file fall into a heap at the bottom of the screen. This looks spectacular but it's hard to see the funny side when it's your document.

Most viruses remain dormant until activated by something. For example, the Jerusalem B virus is activated every Friday the 13th and erases any file you try to load from your disk. The Michelangelo virus was programmed to become active on March 6th 1992, the 517th birthday of Michelangelo. It attacked computer systems throughout the world, turning data on hard disks into nonsense.

Viruses are most commonly passed via discs but they can also spread through bulletin boards, local area networks and e-mail attachments. The best form of treatment is prevention. Use an antivirus program to check a disk before using it. Always download email attachments onto a disk and check for viruses. If you do catch a virus, there are antivirus programs to hunt down and eradicate the virus. The problem is that around 150 new viruses appear every month and you must constantly update your antivirus package to deal with these new forms.

Vocabulary:

A cartoon character – мультиплікаційний персонаж,
to attack one's computer – атакувати чийсь комп'ютер,
to «infect» one's system – вразити комп'ютерну систему,
to remain dormant – залишатися у стані спокою,
to fall into a heap at the bottom of the screen – бути поваленим в купу в нижній частині монітора,
to turn data into nonsense – перетворити дані в нісенітницю,
to hunt down and eradicate the virus – зловити і знищити вірус,
to check for viruses – перевірити на наявність вірусів,
to pass via disk – проходити / потрапити через диск.

Comprehensive Questions

1. What is only one type of computer crime?
2. What is a computer virus?
3. What are the viruses deliberately written for?
4. Where can viruses hide themselves?
5. What should be done in order not catch a virus?

6. What are antivirus programs used for?
7. How many new viruses appear every month?
8. What should one constantly do to deal with the new forms of viruses?
9. Do you know any present day viruses? What are their effects?
10. What is the best form of treatment?

Text Study

Exercise 1. Read and translate the word-combinations from the text.

A form of software, to destroy data, to be written deliberately, fairly harmless, to attach themselves to the operating system, to wipe out all data, to erases any file you try to load from your disk, to spread through bulletin boards, the best form of treatment, to update your antivirus package.

Exercise 2. Fill in the chart according to the contents of the text.

<i>Virus name</i>	<i>Characteristics and effect produced</i>
<i>Yankee Doodle</i>	
<i>Cascade</i>	
<i>Michelangelo</i>	
<i>Jerusalem B</i>	

Exercise 3. Find the proper terms for the following definitions.

- | | |
|---|---|
| 1. Changing data in a computer without any permission. | a) virus |
| 2. Illegally copying software Programs. | b) data |
| 3. A program written with the purpose of causing damage | c) hacking or causing a computer to behave in an unusual way. |
| 4. A computer program or set of programs used to | d) pirating detect, identify and remove viruses from a computer system. |
| 5. A file that is attached to an email message. | e) antivirus program/ software |
| 6. The information processed by a computer | f) e-mail attachment |

Exercise 4. Points to ponder.

1. Computer viruses.
2. The way they spread.
3. Computer system prevention.

Exercise 5. Learn these synonyms.

1. to flash – to blaze
2. to hide – to cover, to shelter
3. to attack – to assault, to assail, to charge
4. to check – to verify

5. to update – to correct, to bring up to date
6. to wipe out – to destroy, to eradicate
7. to creep in – to crawl
8. to spread – to extent, to expanse

Exercise 6. Translate into English.

1. Багато комп'ютерних вірусів подібні до мультиплікаційних персонажів. 2. Якщо комп'ютерний вірус атакуватиме твій комп'ютер, то буде не до сміху. 3. Є велика кількість вірусів, і 150 нових з'являється кожен місяць. 4. Віруси – це програми, які свідомо знищують всі дані. 5. Якщо вірус Мікеланджело атакуватиме твою комп'ютерну систему, він перетворить дані у нісенітницю. 6. Створення комп'ютерних вірусів є комп'ютерним злочином. 7. Вірус Ерусалим Б витирає будь-який файл, який ви намагаєтесь загрузити з вашого диску. 8. Необхідно використовувати антивірусні програми, щоб зловити і знищити комп'ютерні віруси. 9. Ти повинен модернізувати антивірусний пакет, щоб передбачити атаки нових вірусів. 10. Вірус Каскад щойно вразив мою комп'ютерну систему.

Additional Text (for individual work)

Read, translate and memorize the given information.

Virus is a piece of program code that spreads by making copies of itself. The term *virus* was first used in print by Fred Cohen in his 1984 paper “Experiments with Computer Viruses” where he credits Len Adleman with coining it. Although Cohen’s use of *virus* may have been the first academic use, it had been in the common parlance long before that. A mid-1970s science fiction novel by David Gerrold, *When H.A.R.L.I.E. was One* includes a description of a fictional computer program called VIRUS that worked like a virus (and was countered by a program called ANTIBODY). The term “computer virus also appears in the comic book “Uncanny X-Men” No.158, published in 1982. A computer virus’s basic function is to insert its own executable code into that of other existing executable files, literally making it the electronic equivalent to the biological virus, the basic function of which is to insert its DNA code into the DNA code of other existing cells.

Lesson 25

Read and translate the text:

Software Engineering

Computer programs or the software are growing more and more complicated, requiring teams of programmers and years of effort to develop. As a consequence, a new subdiscipline, software engineering, has arisen. The development of a large piece of software is perceived as an engineering task to be approached with the same care as the construction of a skyscraper, for example, and with the same

attention to cost, reliability, and maintainability of the final product. The software-engineering process in general consists of several phases: (1) identification and analysis of user requirements, (2) development of system specifications (both hardware and software), (3) software design (perhaps at several successively more detailed levels), (4) implementation (actual coding), (5) testing, and (6) maintenance.

Even with such an engineering discipline in place, the software-development process is expensive and time-consuming. Since the early 1980s, increasingly sophisticated tools have been built to aid the software developer and to automate as much as possible the development process. Such computer-aided software engineering (CASE) tools span a wide range of types, from those that carry out the task of routine coding when given an appropriately detailed design in some specification language to those that incorporate an expert system to enforce design rules and eliminate software defects prior to the coding phase.

As the size and complexity of software has grown, the concept of reuse has become increasingly important in software engineering, since it is clear that extensive new software cannot be created cheaply and rapidly without incorporating existing program modules (subroutines, or pieces of computer code). One of the attractive aspects of object-oriented programming is that code written in terms of objects is readily reused. As with other aspects of computer systems, reliability – usually rather vaguely defined as the likelihood of a system to operate correctly over a reasonably long period of time – is a key goal of the finished software product. Sophisticated techniques for testing software have therefore been designed. For example, a large software product might be deliberately "seeded" with artificial faults, or "bugs"; if they are all discovered through testing, there is a high probability that most actual faults likely to cause computational errors have been discovered as well. The need for better trained software engineers has led to the development of educational programs in which software engineering is either a specialization within computer science or a separate program. The recommendation that software engineers, like other engineers, be licensed or certified is gaining increasing support, as there is the momentum toward the accreditation of software engineering degree programs.

Vocabulary:

To perceive – сприймати,
maintainability – ремонтпридатність,
implementation – виконання,
maintenance – обслуговування,
sophisticated tools – складні інструменти,
routine coding – процедура кодування,
to eliminate – виключати, ліквідовувати,
the concept of reuse – концепція повторного використання,
extensive – обширний,
subroutines – підпрограми,
likelihood – ймовірність,
a key goal – основна мета,

deliberately – свідомо.

Comprehensive Questions

1. What do the computer programs require?
2. Why has software engineering arisen as a new subdiscipline?
3. What phases does software engineering process consist of?
4. What is software development process?
5. What do the types of CASE (computer-aided software engineering) do?
6. What concept has become increasingly important?
7. What is the main advantage of object-oriented programming?
8. What is a key goal of the finished software product?
9. What are the capabilities of software testing techniques?
10. What has led to the development of educational programs?

Text Study

Exercise 1. Read and translate the words and word-combinations with them paying attention to word formation.

code – coding

computer – computational

use – user – reuse

program – programmer – programming

develop – development – developer

engineer – engineering

maintenance – maintainability

Software engineering, software design, software-development process, software developer, computer-aided software engineering (CASE), software defects, computer code, software product, computational error, development of educational programs, actual coding, object-oriented programming, program module.

Exercise 2. Translate these sentences into Ukrainian paying attention to the function of the Infinitive.

1. Computer programs are growing more complicated, requiring teams of programmers and years of effort *to develop*.
2. The development of a large piece of software is perceived as an engineering task *to be approached* with the same care as the construction of a skyscraper.
3. Since the early 1980s, increasingly sophisticated tools have been built *to aid* the software developer and *to automate* as much as possible the development process.
4. As with other aspects of computer systems, reliability – usually rather vaguely defined as the likelihood of a system *to operate* correctly over a reasonably long period of time – is a key goal of the finished software product.

Exercise 3. Say whether these sentences are true or false.

1. The software has grown more in recent years.
2. The construction of a skyscraper is a more difficult engineering task than software development.

3. The software development process is cheap and rapid.
4. Sophisticated tools must be built to automate the software development process.
5. Reliability of computer systems is a key goal of the finished software product.
6. Computational errors can be discovered through software testing.
7. The concept of reuse in software engineering is not very popular now.
8. New software can be created cheaply and rapidly.
9. One of the advantages of object-oriented programming is that code written in terms of objects is readily reused.
10. Sophisticated techniques for testing software haven't therefore been designed.

Exercise 4. Complete the sentences.

1. The software are growing more and more complicated, requiring 2. The software-engineering process in general consists of several phases: 3. The software-development process is 4. Since the early 1980s, increasingly sophisticated tools have been built to aid the software developer and 5. It is clear that extensive new software cannot be created cheaply and rapidly without 6. As the size and complexity of software has grown, the concept of reuse has become 7. One of the attractive aspects of object-oriented programming is that 8. Reliability is usually rather vaguely defined as 9. ... is a key goal of the finished software product. 10. The need for better trained software engineers has led to

Exercise 5. Translate into English.

1. За останні роки програмне забезпечення зросло і стало складнішим. 2. Я не знав, що процес програмної інженерії складається з кількох етапів. 3. Він не думав, що процес створення програмного забезпечення є дорогий і тривалий. 4. Зрозуміло, що нове програмне забезпечення не може буди дешево і швидко створено без об'єднання існуючих модулів програм. 5. Надійність – основна мета закінченого програмного забезпечення. 6. Вчитель сказав, що створення великої частини програмного забезпечення сприймається як інженерне завдання із збудування хмарочоса. 7. Я не знав, як можна виявити комп'ютерні помилки. 8. Складні технологічні прийоми вже спроектовані для перевірки програмного забезпечення. 9. Студент запитав, яка одна з переваг об'єктно-орієнтованого програмування? 10. Зараз є велика потреба у краще підготовлених інженерах-програмістах.

Questions for Selfcontrol

Test yourself

1. Who and when designed the first computer?
2. What is a computer?
3. Where does the word computer come from?
4. What are the input devices of the computer?
5. What are the output devices of the computer?
6. What does the computer science mean?
7. What are the different types of computers based on the operational principle?

8. What are the different types of computers based on their sizes and processing power?
9. What are the several uses of computers?
10. Does the computer have a negative impact on our eyesight?
11. What is CPU?
12. What does a computer motherboard consist of?
13. What is a hard disk?
14. What is RAM?
15. What is ROM?
16. What is a monitor?
17. What is a keyboard?
18. What is a mouse?
19. What is a display?
20. What is a printer?
21. What is storage?
22. What types of disks do you know?
23. What does a system unit house?
24. What is a scanner?
25. What is a scanner resolution?
26. How may hardware elements be defined?
27. What are the software elements?
28. What is programming?
29. What is a computer program?
30. What programming languages do you know?
31. What is the easiest programming language to learn?
32. What are the object-oriented high level programming languages?
33. Who and when founded Microsoft Company?
34. What does Microsoft Company produce?
35. What versions of Windows do you know?
36. What does computer graphics deal with?
37. How is computer screen used in fine arts by artists?
38. When and where did the history of Internet begin?
39. What is the most important Internet service nowadays?
40. What is the most important problem of Internet?
41. What is a computer science?
42. What phases does software engineering process consist of?

Appendix

Advantages and Disadvantages of Computers in Education

Computers are the best way of teaching subjects to students. These days, all schools and colleges have computer labs where they receive practical training from their teachers. Computers assist teachers in teaching their students easily and quickly. With the help of computers and the broadband Internet facility, students can search for the concepts or things which they wish to know, by referring to relevant websites. The Internet is an ocean of information and surfing daily will increase the knowledge of these students greatly. Another [advantage of computers](#)

is that the students will be able to gain knowledge of various subjects and things which are other than their school syllabus. Such form of receiving education is considered to be more effective than only learning from textbooks prescribed by the authorities. Understanding the [role of computers in education](#) is a must for all of us.

Use of computers in the classroom can help teachers to teach much more than they can do without them. The students can be shown charts, diagrams and figures while teaching practical oriented subjects such as Algebra, Geometry, Physics, Biology or Botany. Teachers can give many assignments to students which they can complete with the help of computer packages. Introduction of computers in educational institutes can help students learn different computer software and hardware, under the guidance of their teachers. For example, students will come to know which are the important parts of the computer, what are their functions and how does a computer actually work. They can learn the new packages and software tools early in life so that they can grasp vital concepts in higher studies comfortably. Importance of computer education is highlighted with the fact that computer literate students have a greater chance of grabbing the best jobs in the industry than those who do not have the required computer knowledge. Students need to be aware of all computer uses for their own benefit.

Use of computers in education does not end here. Many times, it happens that students are not able to enroll for degree courses which they are interested in due to lack of money or because the institute is far away from their residence. The introduction of distance learning has solved all these problems. The distance learning programs or online degree programs, which involve learning with the help of computers provides education at much affordable costs than the costs incurred on full-time training. Also, students living far off, in remote areas, need not travel several kilometers and come to the city as they can now learn from the comforts of their home provided they own a desktop computer with an Internet connection.

However, there are certain disadvantages of use of computers in education which we must beware of. Firstly, doing all calculations with the help of software and calculator can affect our own mathematical ability. In simple words, computers can make us a bit lazy and this can cause problems while giving examinations which are not conducted online, but need us to do all calculations by ourselves. With ready-made information available on the Internet, students will not take any interest in reading reference books and searching for information using other sources. Reading less can hamper their progress and educational future.

From this article, on use of computers, we conclude that computers and education have become inseparable from each other. We also understood how has computer technology affected our lives in a positive way. By making wise use of computers, we can learn a lot of new things in a relatively short period. So, learn computers for a bright future!

You wake up in the morning, switch on your PC and check the mail or update your Facebook status. You go to work, switch on your computer and work. You come back from work, and re-check your mails, make entries in your account folder, check your bank balance, etc. You encourage your child to watch *NatGeo*, or undertake grammar test using the latest software. You watch a movie or play

one round of computer game and end your day. But wait, in this busy schedule, have you wondered how much you are dependent on your PC or computer for your daily activities. Take a look at the following points which will help you realize the actual role of computers in daily life.

What to Look for When Buying a Computer

Knowing what to look for when buying a computer, can help you to narrow down your search for buying a personal computer that is economical and has the configuration as per your requirements. This article discusses the most important points that you must ponder over, before buying a computer.

'What to look for when buying a computer' is the common question that many people are concerned about, when they are planning to buy a desktop for their home or office work. While buying a new computer, you will have to focus on various issues like the budget you have fixed to buy the computer and the tasks that you will carry out with the computer.

Your requirements will determine the computer's configuration. For instance, if you love playing online games, then the configuration must be such that it can deliver quality performance without affecting the functioning of the computer (slowing the execution speed, etc.)

You should also consider if the daily tasks like checking mails, writing text documents, browsing internet, listening music and watching movies can be easily carried out on the computer. Since, technology has developed much, the tasks that you carry out daily are convenient in most of the computers available today. So before anything else, you have to assess your requirements as configuration is a very crucial aspect while purchasing computers. There are some differences in buying notebook computers and desktop computers, as the configuration and performances may vary. In this article, we will know about ['what to look for when buying a computer'](#) with a reference to the desktop computers.

Central Processing Units (CPU)

CPU is called the brain of the computer and the chip inside the CPU carries out all the tasks. Among all the computer components, CPU is generally the most expensive one. The performance of a computer depends totally on the quality of the CPU. Choosing a right CPU for your computer can be very technical if you start understanding various intricacies involved in it. Some basic and crucial factors that you must consider before buying processors are the speed (frequency), cores, brand and cache.

Frequency is basically the speed of the computer. The terms like "2.2 GHz" determine the speed of your computer. The more the speed, the better your computer will perform. However, this is not the only factor. The *core* of the computer is also a crucial factor, that determines the performance of the computer. Nowadays, computers have a dual core that is like having more than one CPU in a computer.

Generally, dual core CPU is preferred, however, its performance depends on the programs that are compatible with it. That is why sometimes the performance of the dual core processors is not better than single core processors. Multi-core

processors are generally a viable option for people who are more into stuff like playing video games etc. So, if you are thinking 'what to look for when buying a gaming computer', then do check out the processor speed.

The other things that you should look while buying CPUs is the brand and cache of the CPU. The two best brands that are manufacturers of the processors are Intel and AMD processors. Cache is another factor that helps the CPU to reduce the average time required for processing their information. Since, the speed of processor determines the proper functioning of cache, you needn't think too much about the technicalities of cache memory. Look out for better processors and rest all will be managed. So, what to look for when buying a computer? Undoubtedly, a good processor.

Monitor Size

There are many sizes and styles of computer monitors available nowadays and besides giving an attractive display, the monitors serve various purposes. The size of your monitor must be considerably big, if you want picture clarity for games and movies. The monitor size is the diagonal of the screen. Size, to some extent, determines resolution and price of the computer. Bigger the size of the monitor, higher would be its price. You should also look into matters like resolution, inputs, sound, adjustability, mounting, aspect ratio and various other other options for the monitor.

Operating Systems

A computer operating system is the computer's software and the functionality of the computer depends on the operating system you have installed in the computer. Among the many options that are available to the consumers, Windows, Linux, and Apple's OS X are some of the good options for one to choose. Windows 7 has become popular among the consumers these days. Depending on your choices and preferences, you can get the required OS installed in your computer.

RAM

Technically speaking, memory is nothing but Random Access Memory (RAM) of the computer. Computer memory is not necessarily the memory of the hard drives. Generally, more the memory of the RAM better it would be for the computer. Latest OS like Windows 7 are 64 bit, that means they can handle huge amounts of RAM. The chief feature of the desktop computer is that the memories can be upgraded even after you have already purchased the computer.

Hard Drives

Hard drive is that part of the computer that stores the data and information on your computer. Most hard drive cases nowadays can hold at least three 3.5 inches drives. The capacities of these hard drives can range between 500 GB to 2 TB.

Graphics Card

Graphics card is an essential requirement if your purpose is to watch videos and enjoy gaming. E-mail and word processing software don't need very high graphic power, but the video games need good graphics power. This feature is generally not found in all laptops and this is where the desktop computers have an

advantage. Generally, gaming laptops have quality graphic cards and only a few selected laptops have graphic cards.

So, hope by now you must have some idea on, 'what to look for when buying a computer'. In case you are thinking that 'what to look for when buying a used computer', then I would suggest, make sure that the hardware of the computer is in proper condition and do ask about the warranty period.

The Internet

The Internet is a huge network of computers spanning this planet and is now started to bring in the surrounding area like space. Some computers like servers share data, others just surf the web as clients downloading the data. Public Internet began in the late 70's. In the 70's web users used an interface called telnet, but now that program is mainly obsolete. Telnet is most widely deployed in accessing college email accounts. The Internet is very helpful, because it's a huge database of knowledge, from the pictures of family trips to an analysis of quantum mechanics. Everyone should have the Internet because of its near instantaneous communication and huge wealth of knowledge. But how to go on the Internet and do a search for information we need. There are two ways to do it.

The first is when you know an internet address of data you need and the second one is when you try to find information you need by using a search program. In the beginning we have got to enter any browser you like. It could be an Internet Explorer, Netscape Navigator or Opera, etc. If we have a broadband connection, we connect to the Internet at once. If not, we have to set up and connect to our dial-up service. Finally, if we want to find some information in the Internet, we are to type an address of this data in the browser we use or simply use the existing search-programs such as the Google search program, rambler search program, yandex search program or yahoo search program. They are very simple and popular networks of sites. In these programs we can just type the word or name of thing, we would like to find and then press enter. A search program solves this problem. We get our results in the same window. After we get our results, we simply choose whatever site best matches our query or keeping searching.

Besides data, one can get from the Internet, we can also send and receive e-mail or electronic mail. This internet service is cheaper than ordinary mail and much quicker. It is becoming popular day by day. We can get some news from the Internet, because there are many informational servers in the web.

Electronic Mail (E-Mail)

Electronic mail is a means of sending and receiving messages – internally, nationally, or internationally.

Subscribers to e-mail need a terminal, such as personal computer, a telephone line, and a modem, which is a device for converting signals to text. Messages appear on the receiver's computer screen. E-mail users can also have access to a *mailbox*, which they can call from anywhere in the world and retrieve messages. They receive a mailbox number and a password for confidentiality. Messages can be printed out and kept for reference.

In comparison with telex, e-mail is relatively low in cost, and does not require a trained operator. It is also fast, relatively reliable, and messages can be sent or picked up anywhere in the world, and stored in the mailbox until they are retrieved.

This can be particularly advantageous for users who are communicating across international time zones.

Advantages of Using Internet with Education

The Internet is the largest set of computer networks that use the Internet Protocol. The invention and development of the Internet was the biggest discovery by mankind in the 20th century that led to a revolution. Today, the Internet is used by more than 50% of the world population as its applications are found in nearly every field of life: be it communication, knowledge, news, shopping, marketing, entertainment, education, etc. Here we will see more on the importance or advantages of the Internet in education. So how exactly does the [Internet technology](#) benefit the students for education? Let us take a look at it in detail.

The fast and relatively low cost access is one of the major benefits of Internet to people and students all over the world as getting an Internet connection is easy. Communication and information are the two most important advantages of the Internet in education. Secondly, information can be updated or modified at any time and for any number of times, which helps in learning and better understanding. Let us take a look at the [role of computers in education](#).

Easy Contact

As mentioned above, communication is one of the biggest advantages of the Internet in education. Students can contact other students or their teachers via the E-mail if they have queries about any information. Sharing of information, discussions on a particular subject, etc. can be easily carried out using the Internet. At the same time, teachers can also contact the parents and guardians easily using Internet.

School / College Projects

The Internet can be most useful for completing projects in schools and colleges. As the Internet is an ocean of information, covering nearly all subjects known to man, one can literally find information, research work, etc. required for one's projects. Going through the information on the Internet is definitely faster than reading an entire book on the subject. Homework is also made easier with the help of the Internet which is also one of the important [use of computers in education](#).

Encyclopedia

Sometimes, encyclopedia may not always be available to students and they may have difficulty in gaining access to the books in the library. In that case, the encyclopedia of different subjects available on the Internet can be helpful. This is more useful for students who belong to communities not having English as their mother tongue. Kids and younger children can also be benefited by the Internet by using the pictures, videos, etc. which is one of the major advantages when thinking of [textbooks versus computer teaching](#).

News

All the latest news are constantly updated on the Internet on different news sites which is one of the major advantages of the Internet in education. Students, learning politics, can have an access to all the current affairs through the Internet in the school campus, at home, or at any other place. Historical accounts like speeches, biographies, etc. are also easily available on the Internet in detailed and accurate versions. This is one of the biggest use of Internet in education.

Online Learning

Another [positive effects of Internet](#) in education is the onset of distance education or online learning. With this facility, you can take up short term courses with the course material available online, learn and give exams. One of the benefits of online learning is that people from any part of the world can gain knowledge on different subjects, complete courses, etc. with the help of online learning. With these points, we find that the importance of Internet in education cannot be denied and hence, every student should be given access to the Internet for deeper understanding and knowledge of a subject. However, lots and lots of information can be termed as both, [advantages and disadvantages of the Internet](#) as students can also have an access to unwanted or unethical information and sites. Therefore, it is only wise for parents to make students understand what is good and what not for them or keep a watch on their surfing.

These were some of the advantages of the Internet in education. Lastly, although the Internet cannot replace books or classroom education, it is one of the best substitute for those who wish to gain deeper knowledge on literally every subject. Good luck!

Computer Games Reaching the Next Level

Nowadays computer games are far from mindless and aggressive timewasting. For years skilled game designers and developers create virtual worlds, which we can use later as an educational material.

One sunny afternoon in Los Angeles, I stole a car. Racing through the streets, I ran over about ten people, including a man walking his dog. I was on my way to save my brother from a gang of drug dealers, I stopped in front of a dirty house and ran inside, where, unfortunately, I was shot and killed.

This crash course in *Grand Theft Auto* took place in the land of electronic software entertainment, more commonly known as computer or video games. The games industry is estimated to be worth at least \$ 30 billion a year worldwide, and it now pulls in more money than movie-making does.

If you are a non-gamer like me, or if you haven't played in years, the first thing that you notice about a game is the graphics. Hardware and software technology have improved enormously, and high-definition artwork has made the environments look wonderfully realistic and the virtual players surprisingly human. The characters also act like real people, showing preferences, personalities, and emotions.

Since the first computer game, *Spacewar*, was developed 45 years ago at the Massachusetts Institute of Technology (MIT), games have grown up. Technical universities produce highly skilled game designers and developers, and the academic study of games, called ludology, looks at the psychology of gaming.

Creating top-level products can take up to five years and may involve more than a hundred people, including teams of animators and programmers, combining the elements that make a game feel authentic. These include architecture, history, film-video sequences, motion capture of athletes for sports scenes, voices of actors, and an original soundtrack. It costs tens of millions to make an AAA game, so it's an incredibly expensive, risky business.

These AAA games generally run best on consoles – such as Microsoft's Xbox 360, Sony PlayStation 3, or Nintendo Wii – that connect to television sets, and are aimed mainly at hard-core players, roughly 15 percent of the gaming community. Every game generation gets more complicated, and more challenging to finish. Yet, to attract new players, a game has to be easy to learn. The art of good game design is taking this unbelievably complex technology, huge pieces of software code and art, and presenting it all to people in the simplest way.

The true revolution is the rise of online games, which are currently played more on computers than consoles. *World of Warcraft*, which claims to be the largest “massively multiple online role playing game” (MMORPG), has some 8.5 million registered players, who, after buying and installing the software, pay about \$ 20 a month to take part. Players create online characters, called avatars, who organize into opposing alliances in the beautiful fantasy land of Azeroth (www.worldofwarcraft.com).

But reality needn't be far behind when you enter a game world. Lots of games are based on history, sports, or even commerce. For example, in the online simulation *Second Life* (<http://secondlife.com>), avatars spend time buying and selling objects that players have created using simple programming techniques. Many real companies have opened stores in *Second Life*, too. Their marketing specialists have recognized that games can keep users' attention better than newspapers or TV, because players interact with their environment. In computer games, you do not discover what is happening, you make things happen. That's why it's so hard to stop playing once you're inside a virtual world.

Yet, far from being mindless and violent time wasters, games switch on our curiosity and satisfy our desire to seek rewards. By presenting just a few new elements at a time – whether weapons or sandwiches – game developers force players to make one decision after another. We keep probing just a little farther, continually testing our hypotheses about what will happen next. As situations and scenes change, we learn by doing at every turn.

Recognizing the benefits of this mental exercise, older people are discovering gaming as a way to keep their minds fit – about one in four gamers is aged 50 or older. Although teenage boys and young men make up the majority of hard-core players, the number of female gamers is also rising, from under 15 percent in 1987 to about 40 percent today, According to the U.S. Electronic Software Association. Women tend to prefer more reality-based simulations such

as *SimCity*, a game about building and running a city (also online, at <http://simcity.ea.com>).

There are also serious games, those used for education, training, and public policy. The aim of these games is to encourage the use of computer games to solve problems in the public and private sectors (www.seriousgames.org).

Many of today's managers have grown up using joysticks and consoles, so they understand the power of games to get and hold someone's attention. Simulations are already being used to prepare for life-and-death situations, for example in flight training and in various fields of medicine. Firms that are experimenting with games include Alcoa, a U.S. aluminum producer, which is training workers in loading-dock safety. Financial-management and market-strategy games are offered at leading business schools – it's likely that even anti-game campaigners would rather beat off a hostile takeover in a computer game than struggle through books full of lifeless theory.

What games bring to business and academic training is the trial-and-error nature of game play. Serious games are also taking on the big issues of the day: oil shortage, war, terrorism, climate change. These subjects are hugely complicated and constantly changing. But making complex things seem simple is what game developers do best.

Game Crazy.

The world's most game-crazy country may be South Korea, where computer and video gaming is a national sport. Professional gamers are as popular as rock stars. Top games are shown on television, and tens of thousands of fans watch the finals in stadiums. Young South Koreans meet in public gaming rooms called "PC bangs" to play with their friends.

Glossary

Access (to sth.) 1) the chance or right to use or have sth.: Do you have access to a personal computer? 2) to find information on a computer: Click on the icon to access a file.

address a series of words and /or numbers that tells you where you can find sth using a computer: What's your e-mail address?

buffer an area in a computer's memory where data can be stored for a short time.

CD-R a CD on which information, sound and pictures can be recorded once only (an abbreviation for "compact disc recordable").

CD-RW a CD on which information, sound and pictures can be recorded and removed more than once (an abbreviation for “compact disc rewritable”).

CD-ROM a CD on which large amounts of information, sound and pictures can be stored, for use on a computer (an abbreviation for “compact disc read-only-memory”): The software package contains 5 CD-ROMs.

chat room an area on the Internet where you can join in a discussion.

computer an electronic machine that can store, find and arrange information, calculate amounts and control other machines: The bills are all done by computer * a computer programme * a home/personal computer computer software / games.

computer-literate able to use a computer.

computerize (also –ise) to use computers to do a job or to store information: The whole factory has been computerized.
We have now computerized the library catalogue.

computing the use of computers: She did a course in computing.

cybercafé a place with computers where customers can pay to use the Internet.

data facts or information: to gather/collect data * data capture/retrieval (= ways of storing and looking at information on a computer).

database a large amount of data that is stored in a computer and can easily be used, added to, etc.

desktop 1) a computer screen on which you can see icons (= symbols) showing the programmes, information, etc that are available to be used; 2) also desktop computer – a computer that can fit on a desk.

disk drive a piece of electrical equipment that passes information to or from a computer disk.

display words, pictures, etc. that can be seen on a computer screen.

DOS (abbr.) disc operating system.

download to copy a computer file, etc. from a large computer system to a smaller one.

DVD (digital videodisc or digital versatile disc) a disc on which large amounts of information, especially photographs and video, can be stored, for use on a computer or DVD player: Is it available on DVD yet? * a DVD-ROM drive.

e-mail (email) 1) a way of sending electronic messages and data from one computer to another: to send a message by email; 2) a message or messages sent by email: I’ll send you an e-mail tomorrow.

FAQ (abbr.) used in writing to mean “frequently asked questions”.

fax (fax machine) 1) the machine that you use for sending faxes: Have you got a fax? * What’s your fax number?
2) a copy of a letter, etc. that you can send by telephone lines using a special machine: They need an answer today so I’ll send a fax. The company contacted us by fax.

file a collection of information or material on one subject that is stored together in a computer or on a disk, with a particular name: to open/close a file * to create/delete/save/copy a file.

floppy disk (also floppy (pl. floppies) or diskette) a square piece of plastics that can store information from a computer: Don’t forget to back up your

files onto a floppy disk.

gamer a person who likes playing computer games.

game play the features of a computer game, such as its story or the way it is played, rather than the images or sounds it uses.

gaming playing computer games.

hard disk a piece of hard plastic that is fixed inside a computer and is used for storing data and programmes permanently.

hardware the machinery and electronic parts of a computer system.

icon a small picture or symbol on a computer screen that represents a programme:

Click on the printer icon with the mouse.

input 1) the act of putting information into a computer:

The computer breakdown means we have lost the whole day's input.

2) to put information into a computer: to input text/data figures.

Internet (usually the Internet (also informal the Net) the international system of computers that makes it possible for you to see information from all round the world on your computer and to send information to other computers: I read about it on the Internet. * Do you have Internet access?

keyboard the set of keys on a piano, computer, etc.

laptop a small computer that is easy to carry and that can use batteries for power:

Kate took her laptop to Korea.

log in/on to perform the actions that allow you to start using a computer system:

You need to key in your password to log on.

log off/out to perform the actions that allow you to finish using a computer system.

look sth. up to search for information in a book, in the Internet:

to look up a word in a dictionary.

megabyte (MB) a unit of computer memory, equal to 2^{20} bytes (= small units of information): a 40-megabyte hard disk.

memory the part of a computer where information is stored:

This computer has a 640 k memory/ 640 k of memory.

message a written or spoken piece of information that you send or leave for a person when you cannot speak to them: an email message.

message board a place on a website where a user can write or read messages:

I posted a question on the message board.

microprocessor a small unit of a computer that contains all the functions of the Central Processing unit.

modem a piece of equipment that connects two or more computer together by means of a telephone line so that information can go from one to the other.

monitor a machine that shows information or pictures on a screen like a TV: a PC with a 17-inch colour monitor.

mouse a piece of equipment, connected to a computer, for moving around the screen and entering commands without touching the keys:

Use the mouse to drag the icon to a new position.

mouse mat (US mouse pad) a small piece of material that is the best kind of surface on which to use a computer mouse.

network a number of computers that are connected together so that information

can be shared: The network allows users to share files.

online controlled by or connected to a computer or to the Internet: an online ticket booking system * I'm studying French online.

offline not directly controlled by or connected to a computer or the Internet:
For offline orders, call this number. * Could you tell me how to write an email offline?

output the information that a computer produces: data output.

password a series of letters or numbers that you must type into a computer or computer system in order to be able to use it:
Please enter your password.

PC (personal computer) a computer that is designed for one person to use at work or at home.

print sth. out to print information from a computer onto paper:
I'll just print out this file.

printer a machine that prints out information from a computer onto paper:
a laser printer.

process to deal with information, for example on a computer: It will take about ten days to process your application.

program a set of instructions that you give to a computer so that it will do a particular task: to write a program.

programmer a person whose job is to write programs for a computer.

RAM (random access memory) computer memory in which data can be changed or removed and can be looked at in any order: 32 megabytes of RAM.

retrieve to find information that has been stored on a computer:
The computer can retrieve all the data about a particular customer.

ROM (read-only-memory) computer memory that contains instructions or data that cannot be changed or removed.

scan to pass light over a picture or document using a scanner (= an electronic machine) in order to copy it and put it in the memory of a computer.

scanner an electronic machine that can look at, record or send images or electronic information: I used the scanner to send the document by email.

screen the glass surface of a TV or computer where the picture or information appears.

search engine a computer program that searches the Internet for information.

searcher a program that allows you to look for particular information on a computer.

software the programs, etc. used to operate a computer:
There's a lot of new educational software available now.

spreadsheet a computer program for working with rows of numbers, used especially for doing accounts.

store to keep sth. or a supply of sth. for future use: to store information on a computer.

surf the Net to use the Internet.

telnet a computer system which allows you to use data and programs on another computer; a connection made using this system.

telex 1) an international system of communication in which messages are typed on

a special machine and sent by the telephone system; 2) a message sent or received by telex; 3) (informal) a machine for sending and receiving messages by telex; 4) to send a message by telex.

terminal the computer that one person uses for getting information from a central computer or for putting information into it.

type to write sth. using a computer or typewriter: How fast can you type?
 * Type (in) the filename, then press "Return".

upload to move data to a larger computer system from a smaller one.

URL (uniform/universal resource locator) the address of a World Wide Web page.

usenet a service on the Internet used by groups of users who email each other because they share a particular interest.

user a person who uses a service, machine, place, computer, etc.: computer software users.

usergroup a group of people who use a particular thing and who share information about it, especially people who share information about computers on the Internet.

username the name you use in order to be able to use a computer program or system: Please enter your username.

VDU (visual display unit) a screen on which you can see information from a computer.

virus instructions that are put into a computer program in order to stop it working properly and destroy information.

virtual made to appear to exist by using a computer: virtual reality.

web (the Web) = World Wide Web: I looked it up on the Web.

webcam a video camera that is connected to a computer so that what it records can be seen on a website as it happens.

weblog (blog) a personal record that smb. puts on their website. In their blogs, people usually write about things that interest them and about other websites that they have visited.

web page a document connected to the World Wide Web, usually forming part of a website, that anyone with an Internet connection can see:
 We learned how to create and register a new web page.

website (also site) a place connected to the Internet where a company, an organization or an individual person puts information:
 I found it on their website. * Visit our website to learn more.

Wi-Fi a system for sending data over a computer networks using radio waves instead of wires (the abbreviation for "wireless fidelity").

window an area within a frame on a computer screen, in which a particular program is operating or in which information of a particular type is shown: to create / to open a window.

word processor (processing) a type of computer that you can use for writing letters, reports, etc. You can correct or change what you have written before you print it out.

Abbreviations

A

ADP – automated data processing – автоматизована обробка даних,

ALU – arithmetic-logical unit – арифметико-логічний пристрій (блок центрального процесора, який виконує всі дії мікропроцесора на основі математичних і логічних операцій),

APL – application programming interface – інтерфейс прикладного управління,

APL – A Programmable language – високорівнева мова програмування,

AU – arithmetic unit – арифметичний пристрій,

a.v.c. – automatic volume control – автоматичне регулювання гучності.

В

BASIC – (Beginner's All-purpose Symbolic Instruction Code) – проста у використанні мова програмування високого рівня, розроблена у 1964 р.,
BDOS – basic disk operating system – базова дискова операційна система,
BIOS – basic input/output system – базова система введення-виводу,
b.o.p.s. – Billion operations per second – мільярд операцій в секунду (одиниця вимірювання швидкодії системи),
bpi – Bits per inch – число біт на дюйм,
b.p.s. – число біт в секунду (одиниця вимірювання щільності запису на носії).

С

CAD – computer-aided design – комп'ютерне проектування,
CAI – computer-aided instruction – комп'ютерне навчання,
CAN – cancel – символ сканування,
CAT – computer-aided testing – комп'ютерний контроль (тестування),
CD – compact-disk – компакт-диск,
CDD – compact-disk drive – дисковод для компакт-дисків,
CD-DA – compact-disk-digital audio – цифровий аудіо компакт-диск,
CD-ROM – compact-disk, read only memory – неперезаписуваний компакт-диск,
CMI – computer-managed instruction – команди, що подаються комп'ютером,
COBOL – Common Business Oriented Language – високорівнева мова програмування для загального комерційного використання,
cps – characters per second – число символів в секунду (одиниця вимірювання швидкості друку принтера),
CPU – central processing unit – центральний процесор (ЦП),
CRT – cathode-ray tube – електронно-променева трубка (дисплея),
CU – control unit – пристрій керування.

Д

DB – database – база даних,
DEL – delete – символ видалення,
DMA – direct memory access – прямий доступ до пам'яті,
DOS – disk operating system – дискова операційна система,
DS – double-sided – двосторонній,
DVD – digital video disk – цифровий відеодиск.

Е

ECC – error-correction code – код з виправленням помилок,
EDI – Electronic Data Interchange – електронний обмін даними,
EDP – electronic data processing – електронна обробка даних,
EPROM – erasable programmable read-only memory – той, що можна витерти програмований постійний запам'ятовуючий пристрій (ППЗУ),
ETB – end of transmission block – кінець блоку передачі (символ).

Ф

FCB – file control block – блок управління файлами,
FD – floppy disk – гнучкий диск,

FDD – floppy disk drive – дисковод для гнучких дисків,
FORTRAN – скор. fourth generation programming language – Фортран
(високорівнева мова програмування, орієнтована на вирішення завдань
математичного характеру),
FTR – File Transfer Protocol – протокол передачі файлів.

G

GB, Gb – gigabyte гігабайт, Gc – gigacycle – гігацикл,
GP – general purpose – загального призначення,
GUI – Graphic User Interface – графічний інтерфейс користувача.

H

HD – high density – висока щільність,
HDD – high-disk drive – дисковод для жорсткого диска,
Hi-Fi – high fidelity – високонадійний; з високою точністю відтворення,
HF – high frequency – високочастотний,
HW, hw – hardware – апаратні засоби.

I

IBM – International Business Machine – фірма з виробництва комп'ютерів,
IC – integrated circuit – інтегральна схема,
I/O – input/output – пристрій вводу-виводу,
Intel – найбільша у світі корпорація з виробництва мікропроцесорів (США),
IP – Internet Protocol – протокол маршрутизації,
ISOC – Internet Society – Суспільство Інтернет,
IT – information technology – інформаційна технологія/техніка.

K

KB, Kbyte – кілобайт,
K/B, KBD, kbd – keyboard – клавіатура,
Kc – kilocycle – кілоцикл,
KHz – kilohertz – кілогерц.

L

LAN – local-area network – локальна мережа,
LCD – liquid-crystal display – рідкокристалічний дисплей,
LSI – large scale integration – високий рівень інтеграції.

M

MB, Mb – megabyte – мегабайт,
M/B – motherboard – материнська плата,
MCB – memory control block – блок управління пам'яттю,
MMCD – Multimedia Compact Disk – мультимедійний компакт-диск,
MP – microprocessor – мікропроцесор,
MPU – microprocessor unit – мікропроцесорний пристрій,
MS DOS – Microsoft Disk Operational System – стандартна операційна система
для IBM IBM-сумісних комп'ютерів, розрахована на одного користувача,
MSI – medium-scale integrated circuit – середня інтегральна схема.

N

NAK – negative acknowledgement – непідтвердження прийому (символів),
NetBIOS – Network Basic Input/Output System – базова система вводу-виводу
мережі,

О

OCR – optical character reader (recognition) – оптичне зчитування (розпізнавання) символів,
OMR – optical mark reader – оптичний пристрій зчитування знаків,
OS – operating system – операційна система.

Р

PC – personal computer – персональний комп'ютер,
PFM – pulse-frequency modulation – частотно-імпульсна модуляція,
PIF – program information file – інформаційний файл програми,
PL – Programming Language – мова програмування,
PROLOG – PROgramming in LOGic – високорівнева мова програмування, яка використовується в дослідженнях, пов'язаних зі штучним інтелектом,
PROM – programmable read-onle memory – програмований постійно-запам'ятовуючий пристрій.

Р

RAM – random-access memory – оперативний запам'ятовуючий пристрій,
r.c. – remote control – дистанційне керування,
r.mt. – reverse motion – зворотній рух,
ROM – read-only memory – постійний запам'ятовуючий пристрій,
R/W – read/write – читання/запис.

С

SCSI – Small Computer System Interface – Інтерфейс малих комп'ютерних систем,
SNOBOL – String-Oriented Symbolic Language – високорівнева мова програмування орієнтована на обробку символьних послідовностей,
SOM – start of message – початок повідомлення,
SP – space character – символ пробілу,
SSI – small-scale integration – інтеграція малого рівня.

Т

TCP – Transmission Control Protocol – транспортний протокол,
TF – time factor – коефіцієнт часу Turbo Pascal – швидкодіючий компілятор для мови Паскаль (1984 р.).

U

UNIVAC – UNIVersal Automatic Computer – універсальний комп'ютер,
UNIX – операційна система, яка використовується в багатьох комп'ютерах (від персональних до мейнфреймів),
UPS – uninterruptured power supply – безперебійне джерело харчування,
URL – Universal Resource Locator – універсальний покажчик ресурсів.

V

VDT – visual display terminal – відеотермінал,
v.f. – velocity factor – коефіцієнт швидкості
VLSI – very large-scale integration – інтеграція надвисокого рівня,
VR – virtual reality – віртуальна реальність,
v.p. – voltage regulator – регулятор напруги,
VRML – Virtual Reality Modeling Language – мова моделювання віртуальної реальності,

VT – vertical tabulator – вертикальний табулятор.

W

WAN – wide-area network – глобальна мережа,

WWW – World Wide Web – Всесвітня інформаційна мережа.

Для нотаток

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