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МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
МИКОЛАЇВСЬКИЙ НАЦІОНАЛЬНИЙ АГРАРНИЙ УНІВЕРСИТЕТ

Факультет культури й виховання
Кафедра іноземних мов

АНГЛІЙСЬКА МОВА

Методичні рекомендації та навчальний матеріал для аудиторної та самостійної роботи здобувачів вищої освіти освітнього ступеня «Молодший бакалавр» початкового рівня (короткий цикл) спеціальності 122 «Комп’ютерні науки» денної форми навчання

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ПЕРЕДМОВА

Методичні рекомендації та навчальний матеріал з англійської мови призначені для аудиторної роботи здобувачів ступеня вищої освіти «Молодший бакалавр» спеціальності «Комп'ютерні науки». Методичні рекомендації розроблені згідно з Типовою програмою Міністерства освіти і науки України, програмою «English for Specific Purposes» на засадах компетентнісного, комунікативного та системного підходів.

Метою методичних рекомендацій є розвиток навичок професійно орієнтованої комунікації англійською мовою, засвоєння нових лексичних одиниць за професійним спрямуванням, повторення та закріплення граматичних конструкцій у поєднанні з фаховою лексикою. Професійно спрямовані тексти та вправи сприяють реалізації зазначеної мети. Автентичні тексти є важливим джерелом спеціальної лексики з фаху, лексичні вправи спрямовані на закріплення лексичних знань, умінь і навичок сприяють поетапному цілеспрямованому формуванню лексичної компетенції з фаху.

Методичні рекомендації складається з 6 уроків, кожен з яких містить фахові тексти, різноманітні вправи та завдання на знання фахової лексики.

На опрацювання кожного розділу відводиться по 2 години аудиторної та 4 години самостійної роботи.

104. underscore - знак підкреслення
105. upper case / uppercase - великі букви (великі літери)
106. USB (Universal Serial Bus) - універсальна послідовна шина
107. USB flash drive - USB-накопичувач / флеш-накопичувач
108. username - ім'я користувача / логін
109. video card / video adapter / graphics-accelerator card / display adapter / graphics card - відеокарта / графічна плата / графічний прискорювач / графічна карта / відеоадаптер
110. virus ['vaiərəs] - вірус
111. web hosting - веб-хостинг / хостинг
112. webmaster - веб-майстер / вебмастер
113. website / web site - вебсайт / сайт
114. wireless internet (= WiFi) - бездротовий інтернет / бездротовий доступ в інтернет
115. wireless router - бездротовий маршрутизатор
116. word processor - текстовий процесор / текстовий редактор
117. World Wide Web (WWW) / the Web - Всесвітня павутина / веб

82. pixel ['piksil] - піксель
83. power cable - мережевий кабель / шнур живлення / кабель електроживлення
84. processor speed / processor frequence / CPU speed / CPU frequency - швидкість процесора / частота процесора
85. program [' prəugræm] - програма
86. random-access memory (RAM) - пристрій, що запам'ятовує з довільним доступом (ЗУПД) / пристрій з довільною вибір-кой (ЗУПВ) (також часто позначає оперативну пам'ять комп'ютера, оперативний пристрій (ОЗУ))
87. Read Only Memory (ROM) - постійний запам'ятовуючий пристрій (ПЗУ)
88. resolution – роздільна здатність
89. screen - екран
90. screenshot - знімок екрана / скріншот / скрін (зображення, яке показує те, що користувач бачить на екрані)
91. search engine - пошукова система
92. server - сервер
93. shortcut - ярлик (файл, службовець покажчиком на який-небудь об'єкт, про-граму, команду, і т.п.)
94. slash - слеш / коса риска
95. smartphone - смартфон
96. software / computer software - програмне забезпечення
97. sound card / audio card - звукова плата / звукова карта / аудіокарта
98. space - пробіл
99. space bar - клавіша "пробіл"
100. speakers - колонки
101. spreadsheet - електронна таблиця
102. tablet computer / tablet - планшетний комп'ютер / планшет
103. TFT (Thin Film Transistor) - тонкоплівковий транзистор

LESSON 1
COMPUTING BASICS

1. Read and translate the text.

The first computers were used primarily for numerical calculations. However, as any information can be numerically encoded, people soon realized that computers are capable of general-purpose information processing. Their capacity to handle large amounts of data has extended the range and accuracy of weather forecasting. Their speed has allowed them to make decisions about routing telephone connections through a network and to control mechanical systems such as automobiles, nuclear reactors, and robotic surgical tools. They are also cheap enough to be embedded in everyday appliances and to make clothes dryers and rice cookers “smart.” Computers have allowed us to pose and answer questions that could not be pursued before. These questions might be about DNA sequences in genes, patterns of activity in a consumer market, or all the uses of a word in texts that have been stored in a database. Increasingly, computers can also learn and adapt as they operate.

Computers also have limitations, some of which are theoretical. For example, there are undecidable propositions whose truth cannot be determined within a given set of rules, such as the logical structure of a computer. Because no universal algorithmic method can exist to identify such propositions, a computer asked to obtain the truth of such a proposition will (unless forcibly interrupted) continues indefinitely – a condition known as the “halting problem.” Other limitations reflect current technology. Human minds are skilled at recognizing spatial patterns – easily distinguishing among human faces, for instance – but this is a difficult task for computers, which must process information sequentially, rather than grasping details overall at a glance. Another problematic area for computers involves natural language interactions. Because so much common knowledge

and contextual information is assumed in ordinary human communication, researchers have yet to solve the problem of providing relevant information to general-purpose natural language programs (from https://www.britannica.com/technology/computer).

2. Fill in the gaps in the sentences with the suitable words (the first letter of the word is given as a clue).

1. A C _____can store much data.
2. The module provides 16Mb of m _____ .
3. A computer v_____ can cause system failure, wasting computer resources, corrupting data, etc.
4. We c _____ large files to reduce downloading time.
5. People use a search engine such as Google to locate data via the w_____ .
6. I sat down at the computer, moved the m_____and opened a browser.
7. It is easy to c ___ and p _____ the text if necessary.
8. This allows the user to move the c _____ to the edge of the screen and as a result, the camera will move in the same direction.
9. A m _____and a computer k _____are fine for word processing but not for recording and mixing.

3. Use the correct form of the verb "to be" in the following sentences:

1) An application *is/are* a program designed to fulfil a particular purpose.

2) A program *are/is* a series of coded software instructions to control the operation of a computer or other machine.

3) A cursor *am/is* a movable indicator on a computer

55. hertz (Hz) - Герц (Гц)
56. home page / homepage - головна сторінка / домашня сторінка / початкова сторінка
57. hotspot - точка доступу
58. hypertext ['haipəˌtekst] - гіпертекст
59. icon [' aikɔn] - іконка / значок / піктограма
60. installation [instə'leiʃn] - інсталяція / установка (програми)
61. interface [' intəfeis] - інтерфейс
62. Internet service provider (ISP) - інтернет -провайдер / провайдер / постачальник послуг інтернету
63. IP (Internet Protocol) address - ай-пі адреса (унікальний адреса вузла (комп'ютера) в мережі)
64. keyboard [' ki: bɔ: d] - клавіатура
65. laptop / notebook - ноутбук
66. link - посилання
67. local area network (LAN) - локальна обчислювальна мережа (ЛОМ)
68. lower case / lowercase - у нижньому (малі літери)
69. mail box - поштовий ящик
70. memory - пам'ять
71. menu ['menju:] - меню
72. microphone / mic [maik] - мікрофон
73. motherboard - материнська плата
74. mouse - миша, мишка, маніпулятор "миша"
75. mouse mat (BrE) / mousepad (AmE) - килимок для миші
76. network - мережа
77. operating system (OS) - операційна система (ОС)
78. page / web page / webpage - сторінка / веб-сторінка / інтернет-сторінка
79. palmtop ['pɑ: mtɒp] - кишеньковий комп'ютер / "надолонник"
80. password - пароль
81. PDA (Personal Digital Assistant) - КПК (кишеньковий персональний комп'ютер)

36. digital computer - цифровий комп'ютер
37. DOS (Disk Operating System) - ДОС (дискова операційна система)
38. dot [dɔt] - точка (використовується в адресі сайту))
39. downloading and uploading - скачування і закачування (терміни, примі-няющих щодо даних, що передаються між двома обчислювач-ними системами)
40. driver - драйвер (спеціальне програмне забезпечення, що дозволяє комп'ютеру працювати з будь-яким пристроєм (наприклад, з принте-ром))
41. DVD (= Digital Versatile Disc / Digital Video Disc) - диск DVD (цифровий багатоцільовий диск / цифровий відеодиск)
42. earpieces / earbuds / earphones - навушники (вставляються в вухо)
43. ebook ['i: buk] - електронна книга (текст , який можна завантажити і прочитати на комп'ютері або іншому пристрої)
44. electronic mail / email / email - електронна пошта
45. email address - адреса електронної пошти FAQ (Frequently Asked Questions)
46. firewall - брандмауер / мережевий екран
47. flash drive / USB flash drive - флеш карта / USB-флеш-накопичувач
48. folder / directory [di'rektəri] - папка / директорія
49. font - шрифт format ['fɔ: mæt] - формат
50. Fortran / FORTRAN (Mathematical Formula Translating System) - Фортран (перша мова програмування високого рівня)
51. hard disk drive (HDD) / hard disk / hard drive - жорсткий диск, накопичувач на жорстких магнітних дисках (НЖМД)
52. hardware ['hɑ: dwɛə] - апаратне забезпечення
53. HD (High Definition) - висока якість
54. headphones - навушники

screen.

4) A keyboard *is/are* a panel of keys that operate a computer or typewriter.

5) A mouse pad *are/is* a piece of rigid material on which a computer mouse is moved.

6) Files *are/is* collections of data, programs, etc., stored in a computer's memory or on a storage device under a single identifying name.

4. Read and translate the text.

What is a computer?

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.

What is a computer? Computer, device for processing, storing, and displaying information. *Computer* once meant a person who did computations, but now the term almost universally refers to automated electronic machinery.

Most computers rely on a binary system that uses two variables, 0 and 1, to complete tasks such as storing data, calculating algorithms, and displaying information. Computers come in many different shapes and sizes, from handheld smartphones to supercomputers weighing more than 300 tons.

Who invented the computer? Many people throughout history are credited with developing early prototypes that led to the modern computer. During World War II, physicist John Mauchly, engineer J. Presper Eckert, Jr., and their colleagues at the University of Pennsylvania designed the first programmable digital computer, the Electronic Numerical Integrator and Computer (EINAC).

*What is the most powerful computer in the world?*As of June 2020 the most powerful computer in the world is the Japanese supercomputer Fugaku, developed by Riken and Fujitsu. It has been used to model COVID-19 simulations.

How do programming languages work? Popular modern programming languages, such as JavaScript and Python, work through multiple forms of programming paradigms. Functional programming, which uses mathematical functions to give outputs based on data input, is one of the more common ways code is used to provide instructions for a computer.

What can computers do? The most powerful computers can perform extremely complex tasks, such as simulating nuclear weapon experiments and predicting the development of climate change. The development of quantum computers, machines that can handle a large number of calculations through quantum parallelism (derived from superposition), would be able to do even more complex tasks.

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5. Match words a-d to words 1-4. Use a dictionary if necessary.

1)	to evolve	a) to help
2)	to aid	b) to calculate
3)	to compute	c) to make possible
4)	to enable	d) to develop

6. Read the text and fill in the blanks with the appropriate phrase a-d.

a) which enables them to perform a vast number of calculations or computations in less than no time.

порушує правильну роботу)

16. cable - кабель
17. cache [kæʃ] - кеш / кешування (вид швидкої пам'яті, використовуваної для тимчасового зберігання даних)
18. cell phone - стільниковий телефон
19. central processing unit (CPU) - центральний процесор (ЦП), центральний процесорний пристрій (ЦПУ)
20. character ['kærəktə] - символ (будь-символьне позначення - цифра, буква, і т.п.)
21. click - клік
22. clipboard - буфер обміну (тимчасове сховище даних в пам'яті комп-ютера, призначене для перенесення і копіювання між додатки-ми)
23. COBOL ['kəubəl] (Common Business-Oriented Language) - Кобол (мова програмування, призначений, в першу чергу, для розробки бізнес-додатків)
24. compact disc (= CD) - компакт диск
25. compiler - компілятор (програма, яка переводить текст програми на мові високого рівня в еквівалентну програму на машинній мові)
26. computer case / computer chassis / system unit / case - системний блок
27. computer cooling - система охолодження комп'ютера
28. cookies - куки (дані, що містять інформацію про час і дату відвідування вебсайтів)
29. crash - збій / поломка
30. cursor ['kɜ:sə] - курсор
31. cyberspace [' saibə¸speis] - кіберпростір
32. data ['deitə] - дані (інформація, що зберігається на комп'ютері, в будь-якому вигляді - текстовому, графічному, аудіо, відео, і т.д .)
33. database - база даних
34. debugging - налагодження (програми)
35. desktop computer - настільний комп'ютер, стаціонарний комп'ютер

C. 1) flicker in and out of existence	a) важко зрозуміти
2) at a rapid clip	b) з'являтися і зникати
3) hard to grasp	c) швидко

СЛОВНИК-МІНІМУМ ЛЕКСИКИ З ФАХУ

1. analog computer - аналоговий комп'ютер
2. account [ə'kaunt] - обліковий запис / обліковий запис
3. antivirus software / antivirus software - антивірус / антивірусне програмне забезпечення / антивірусна програма
4. application / app - додаток / програма
5. artificial intelligence (AI) - штучний інтелект (ШІ)
6. assembler [ə ' semblə] - асемблер (мова програмування низького рівня)
7. at sign (= @) - а комерційне / комерційне at / знак "собака"
8. backup ['bækʌp] - резервна копія
9. BASIC (Beginner's All-purpose Symbolic Instruction Code) - бейсик (уні-версальная код символічних інструкцій для початківців)
10. BD / BRD (= Blu-ray Disc) - диск
11. binary numeral system / base-2 number system - двійкова система обчислення (що використовує тільки нулі і одиниці)
12. bit / binary digit - біт (найменша одиниця зберігання і обробки цифрової інформації)
13. boot disk - завантажувальний диск (диск (як правило, жорсткий диск), з якого відбувається завантаження і настройка ПО для комп'ютера)
14. broadband Internet - широкосмуговий інтернет / широкосмуговий доступ в інтернет browser ['brausə] / web browser / internet browser - веб-оглядач, браузер
15. bug - помилка / "баг" (помилка в програмі, що

b) which were invented in the last century, and have evolved into modern computers we use today.

c) where input, output and processing are simply the act of moving the beads into new positions, seeing the changed positions, and counting.

d) which aids humans in performing various kinds of computations or calculations.

7. Fill in the gaps with suitable words:

In its most basic form a computer is any device 1) _____ . The earliest computer was the abacus, used to perform basic arithmetic operations. Every computer supports some form of input, processing, and output. This is less obvious on a primitive device such as the abacus 2) _____ . Nevertheless, this is what computing is all about. We input information; the computer processes it according to its basic logic or the program currently running, and outputs the results. Modern computers do this electronically 3) _____ the fact that we currently use computers to process images, sound, text and other non-numerical forms of data, all of it depends on nothing more than basic numerical calculations. Graphics, sound, etc. are abstractions of the numbers. Every image, every sound, and every word have a corresponding binary code. While abacus may have technically been the first computer most people today associate the word “computer” with electronic computers 4) _____ .

8. Define sentences as True (T) and False (F).

a) The abacus was the first type of the computer._____

b) The use of the computer depends on basic numerical calculations._____

c) Binary codes belong to images, sounds, and words.

9. Give the English equivalents to the following word-

combinations:

Рахівниця, пристрій, тим не менш, в цьому суть процесу комп'ютерних обчислень, дозволяти / давати можливість, вводити дані, видавати результат, обробляти.

10. Answer the questions.

- Does the computer aid humans in performing various kinds of computations or calculations?
- What does every computer support?
- What depends on basic numerical calculations?
- What do most people today associate the word "computer" with?

LESSON 2
FROM THE HISTORY OF COMPUTERS

1. Read and translate the text.

The very first calculating device used was the ten fingers of a man's hands. This, in fact, is why today we count in tens and multiply of tens. Then the abacus was invented, a bead frame in which the beads are moved from left to right. People went on using some form of abacus well into the 16th century; it is being used in some parts of the world because it can be understood without knowing how to read.

During the 17th and 18th centuries many people tried to find easy ways of calculating. J.Napier, a Scotsman, devised a mechanical way of multiplying and dividing, which is how the modern slide rule works. Henry Briggs used Napier's ideas to produce logarithm which all mathematicians used today.

Calculus, another branch of mathematics, was independently invented by Sir Isaac Newton, an Englishman, and Leibnitz, a German mathematician. The first real

5. True or False. Correct false.

1) In the late 1990s, the typical webpage lasted for around 100 days.
2) The number of websites increased by 33 hundred percent from 1994 to 2014.
3) It's rather difficult to give the precise number of websites.
4) The average person visits about 96 separate domains per year.
5) In 2000 Google was fielding 3 million search queries per day.
6) The search engine IFindIt.com is still live and active.
7) The Internet is always changing.

6. Compare the English and Ukrainian equivalents and translate the sentences with the highlighted words into Ukrainian.

A. 1) average	a) тривалість життя
2) lifespan	b) мінливість, швидкоплинність
3) antique	c) сліди
4) traces	d) дивний, незрозумілий
5) iterations	e) середній
6) ephemerality	f) антикваріат
7) weird	g) версії, варіанти
B. 1) to last (for)	a) визнавати
2) to fluctuate	b) перевищувати
3) to exceed	c) тривати, існувати
4) to venture	d) відповідати
5) to field	e) різко змінюватися
6) to leap	f) коливатися, змінюватися
7) to acknowledge	g) наважитися

sites are live but inactive. The web's ephemerality also means the precise number of websites at any given time fluctuates quite a bit. For instance, according to the site Internet Live Stats, there are now 935,950,654 websites as of this writing. (Now 935,950,713. Wait, 935,950,801. You get the idea.) «This is due to the monthly fluctuations in the count of inactive websites», according to the site. «We do expect, however, to exceed 1 billion websites again sometime in 2016».

The weird thing is most of these sites exist without being seen. The average person doesn't venture very far across the web, only visiting 96 separate domains per month, according to a Nielsen estimate in 2013.

In August 1999, Google was fielding 3 million search queries per day. A year later, that number had leaped to 18 million search queries per day. In 2016 Google was serving more than 3.5 billion searches per day - equivalent to searches every second.

Even as most websites flicker in and out of existence at a rapid clip, you can still find some real antiques out there. There still exist some ancient websites like CNN's 1996 year in review, the old Bob Dole presidential-campaign website, and the search engine IFindIt.com, which you can see but it doesn't seem to actually work.

When I started writing this morning, Internet Live Stats told me there were 935,939,044 websites online. Now there are 935,951,027 - almost 12,000 more websites! I have no idea how many disappeared in this time. Which brings me back to a truth about the Internet that's often acknowledged but still hard to grasp: It's always changing. I mean, always, ALWAYS. And though the web is never what it used to be, you can still find little traces of its previous iterations, if you know where to look. (from https://www.theatlantic.com/technology/archive/2015/09/how-many-websites-are-there/408151/).

calculating machine appeared in 1820 as the result of several people's experiments. This type of machine, which saves a great deal of time and reduces the possibility of making mistakes, depends on ten-toothed gear wheels.

In 1830 Charles Babbage, an Englishman, designed a machine that was called 'The Analytical Engine'. This machine, which Babbage showed at the Paris Exhibition in 1855, was an attempt to cut out the human being altogether, expert for providing the machine with the necessary facts the problem to be sowed. He never finished this work, but many of his ideas were the basis for building today's computers.

In 1930, the first analog computer was built by American named Vannevar Bush. The device was used in World War II to help aim guns. Mark I, the name given to the first digital computer, was completed in 1944. The men responsible for this invention were Professor Howard Aiken and some people from IBM. This was the first machine that could figure out long of mathematical problems all at a very fast speed.

In 1946 two engineers at the University of Pennsylvania, J.Eckert and J.Mayshly, built the first digital computer using parts called vacuum tubes. They named their new invention UNIAC. The first generation of computers, which used vacuum tubes, came out in 1950. UNIAC I was an example of these computers which could perform thousand of calculations per second.

In 1960, the second generation of computers was developed and could perform work ten times faster than their predecessors. The reason for this extra speed was the use of transistors instead of vacuum tubes. Second-generation computers were smaller, faster and more dependable than firstgeneration computers.

The third-generation computers appeared on the market in 1965. These computers could do a million calculations a second, which is 1000 times faster than the

first generation computers. Unlike second-generation computers, these are controlled by tiny integrated circuits and are consequently smaller and more dependable.

Fourth-generation computers have now arrived, and the integrated circuits that are being developed have been greatly reduced in size. This is due to microminiturization, which means that the circuits are much smaller than before; as many as 1000 tiny circuits now fit onto a single chip. A chip is a square or rectangular piece of silicon, usually from 1/10 to 1/4 inch, upon which several layers of an integrated circuit are attached or imprinted, after which the circuit is encapsulated in plastic metal. Fourth-generation computers are 50 times faster than third-generation computers and can complete approximately 1.000.000 instructions per second.

2. Give the Ukrainian equivalents to the following word-combinations:

to calculate, ten-toothed gear wheels, to aim guns, responsible, to devise, a chip, rectangular, to encapsulate, dependable, a slide rule, an abacus, a bead frame, to reduce, to figure out, a generation, a predecessor, a layer, attached

3. Fill in the gaps with the suitable words from the list:

Machine, chip, speed, figure out, calculating, vacuum tubes, dependable, reduces, analog, abacus, tiny, logarithm, devised, microminiturization

1. The very first ..... device used was 10 fingers of a man's hand.
2. Then, the ..... was invented.
3. J.Napier ..... a mechanical way of multiplying and dividing.
4. Henry Briggs used J.Napier's ideas to produce ..... .
5. The first real calculating ..... appeared in 1820.
6. This type of machine ..... the possibility of making mistakes.

1. The word interface refers to the way you output information.
2. You interact with the computer by responding to what's on the screen.
3. Many people consider Windows awkward and intimidating as a user interface.
4. DOS commands can be confusing and difficult to remember.
5. With Windows it is difficult to enter and move data around.
6. Windows runs each program or a document in its own separate circle.
7. You can have many windows on the screen at a time.
8. If you want to switch between programs in Windows you have to close one

down and open the next.

9. Clipboard is a facility that lets you copy material between similar document types.
10. All applications that run in Windows use similar commands and procedures.
11. Windows comes supplied with handy programs.
12. Paint is a word-processing program.

4. Read and translate the text.

Websites

Most webpages die after a couple of months. The average lifespan is something like 100 days. That's longer than it used to be. In the late 1990s, the typical webpage lasted for around 44 days.

According to statistics, in 1994 there were fewer than websites online. By 2014, there were more than 1 billion. That represents a 33 million percent increase in 20 years. That's nuts!

Various estimates say about three-quarters of web-

management. The highly successful XP standard was succeeded in late 2006 by Windows Vista, which experienced a troubled rollout and met with considerable marketplace resistance, quickly acquiring a reputation for being a large, slow, and resource-consuming system. Responding to Vista's disappointing adoption rate, Microsoft in 2009 released Windows 7, an OS whose interface was similar to that of Vista but was met with enthusiasm for its noticeable speed improvement and its modest system requirements.

Windows 8 in 2012 offered a start screen with applications appearing as tiles on a grid and the ability to synchronize settings so users could log on to another Windows 8 machine and use their preferred settings. In 2015 Microsoft released Windows 10, which came with Cortana, a digital personal assistant like Apple's Siri, and the Web browser Microsoft Edge, which replaced Internet Explorer. Microsoft also announced that Windows 10 would be the last version of Windows, meaning that users would receive regular updates to the OS but that no more large-scale revisions would be done.

2. Answer the questions to the text:

1. What program is called Windows?
2. Why is it called Windows?
3. What is another feature of Windows?
4. What are the advantages of Windows?
5. What operating system do you use and why?
6. What is a utility program?
7. Why will it be easier for anyone to learn how to use new programs?
8. What versions of Windows are there nowadays? Which of them are the best?

3. Agree or disagree with the statements using phrases of agreement and disagreement.
If you disagree, give the correct variant.

7. In 1930 the first ..... computer was built.
8. This was the first machine that could .... mathematical problems at a very fast speed.
9. In 1946 was built the first digital computer using parts called .... .
10. The reason for this extra ..... was the use of transistors instead of vacuum tubes.
11. The second generation computers were smaller, faster and more ..... than first-generation computers.
12. The third-generation computers are controlled by ..... integrated circuits.
13. This is due to ....., which means that the circuits are much smaller than before.
14. A ..... is a square or rectangular piece of silicon, usually from 1/10 to 1/4 inch.

4. Give the English equivalents for the following words and word combinations:

Винаходити рахівницю; вдосконалення комп'ютерів; математичні задачі; важливе досягнення; застарілий, цифрові комп'ютери; запам'ятовуючий пристрій; значний внесок; двійковий код; висока напруга; низька напруга; електричні імпульси; тисячна частка секунди; відбуватися; завершувати; продовжувати використовувати; механічний спосіб множення і ділення; зменшувати ймовірність помилок; обчислювати довгі списки математичних задач; попередник; більш надійний; прямокутний шматочок кремнію; технічні електронні трубки; вдосконалення; відповідальний за винахід; обчислювати; зберігати команди всередині комп'ютера; запам'ятовувати інформацію; запам'ятовувати команди; сприяти; використовувати одиницю і нуль; спрощувати дизайн; посилювати сигнали; виконувати обчислення.

5. Arrange the items of the plan in a logical order according to the text:

1. J.Napier devised a mechanical way of multiplying and dividing.
2. The very first calculating device was the ten fingers of a man's hands.
3. Babbage showed his analytical engine at Paris Exhibition.
4. The first real calculating machine appeared in 1820.
5. The first analog computer was used in World War II.

6. Look through the text and decide if the sentences are true (T) or false (F). Change the false sentences to make them true:

1. The slide rule was invented hundreds of years ago.
2. During the early 1880s, many people worked on inventing a mechanical calculating machine.
3. Charles Babbage, an Englishman, can well be called the father of computers.
4. The first computer was invented and built in the USA.
5. Instructions used by computers have always been kept inside the computer's memory.
6. Using transistors instead of vacuum tubes did nothing to increase the speed at which calculations were done.
7. As computers evolved, their size decreased and their dependability increased.
8. Today's computers have more circuits than previous computers.
9. Computer technology has developed to a point from which new developments in the field will take a long time to come.

LESSON 6
WINDOWS

1. Read and translate the text.

Microsoft Windows, also called **Windows** and **Windows OS**, computer operating system (OS) developed by Microsoft Corporation to run personal computers (PCs). Featuring the first graphical user interface (GUI) for IBM-compatible PCs, the Windows OS soon dominated the PC market. Approximately 90 percent of PCs run some version of Windows. The first version of Windows, released in 1985, was simply a GUI offered as an extension of Microsoft's existing disk operating system, or MS-DOS. Based in part on licensed concepts that Apple Inc. had used for its Macintosh System Software, Windows for the first time allowed DOS users to visually navigate a virtual desktop, opening graphical "windows" displaying the contents of electronic folders and files with the click of a mouse button, rather than typing commands and directory paths at a text prompt.

Subsequent versions introduced greater functionality, including native Windows File Manager, Program Manager, and Print Manager programs, and a more dynamic interface. Microsoft also developed specialized Windows packages, including the networkable Windows for Workgroups and the high-powered Windows NT, aimed at businesses. The 1995 consumer release Windows 95 fully integrated Windows and DOS and offered built-in Internet support, including the World Wide Web browser Internet Explorer.

With the 2001 release of Windows XP, Microsoft united its various Windows packages under a single banner, offering multiple editions for consumers, businesses, multimedia developers, and others. Windows XP abandoned the long-used Windows 95 kernel (core software code) for a more powerful code base and offered a more practical interface and improved application and memory

15) printer technology when images output directly to the printing plates, without requiring film as an intermediate step.

10. Answer the questions:

1. What device is called “a printer”?
2. What are the functions of a printer spooler?
3. What are dot-matrix printers and its main disadvantages?
4. Describe impact printing technology
5. How do inkjet printers generate image?
6. What are the advantages / disadvantages of inkjet printers?
7. What is a laser printer?
8. Why are laser printers preferred by experts?
9. What technology do thermal transfer printers use?
10. What is an imagesetter?
11. What technology is called computer to plate and why?
12. Where are used plotters and why?

11. Give the Ukrainian equivalents to the following word-combinations:

дозволити змінити порядок документів у черзі і скасувати певні завдання на друк; перетворювати дані в форму, зрозумілу вашому комп'ютеру; відносно низький розширення; комп'ютер, на якому зберігаються файли, які очікують друку; порівняно з більшістю принтерів; якість на виході або розширення; програма на вашому комп'ютері, названа драйвером принтера; відрізнятися за вартістю, швидкістю, якістю друку; швидкість вимірюється в сторінках у хвилину.

7. Answer the questions.

1. When was the first analog computer built?
2. Where and how was that computer used?
3. When did the first digital computers appear?
4. Who was the inventor of the first digital computer?
5. What could that device do?
6. What is ENIAC? Decode the word.
7. What was J. Neumann's contribution into the development of computers?
8. What were the advantages of EDVAC in comparison with ENIAC?
9. What does binary code mean?
10. Due to what invention could the first digital computers be built?

8. Give the Ukrainian equivalents to the following word-combinations:

Process, create, data network, learning tool, electronic digital computers, hardware, software, price has dropped, exceed, computers were running.

9. Mark the sentences in the text that answer the questions.

- What is the computer’s main function?
- What do computers do to process information?
- What kind of information can computers process?
- How has the computer changed the world?
- How has hardware advanced since 1946?
- How has the technology of software changed?
- Why has the price of computer dropped sharply?

LESSON 3
THE COMPUTER-BASED INFORMATION SYSTEM

1. Read and translate the text.

A computer-based information system involves collecting data (input), processing it into information, and storing the information for future reference and output. The system, as you remember, has five basic components – hardware, software, people, procedures, and data/information – and four major phases of activity – input, processing, output, and storage. People are most directly involved during the input and output phases. Each organization has different processing requirements, depending on the nature of its business and activities and how quickly the data needs to be processed. To accommodate these differing needs, the computer-based information system can be designed to use one or both of two basic types of processing approaches: batch and on-line. These approaches differ in terms of the methods for collecting the data for input, the amount of time that passes between data input and actual processing, and the speed with which the output is produced. In the batch approach, data recorded manually on source documents is gathered together in batches and input all at one time. In the on-line approach, data is input immediately, on a case-by-case basis, and is processed immediately. On-line processing used for immediate decision making is often called real-time processing. In many organizations, we can see a direct relationship between computer-related functions and management's organizational philosophy. As a result, organizations set up their computer facilities differently, using either a centralized, decentralized, or distributed computer facility. A centralized computer facility has all its equipment in one location. This equipment serves all the company's departments. A decentralized facility has separate computer equipment for each department in the company. A

5. With appropriate software, you can view the images on a computer, manipulated them, or send them to a … and produce excellent quality colour copies.

6. A … … is a dedicated computer that connects a printer to a network. It enables users to share printing resources.

7. A … … is a utility that organizes and arranges any documents waiting to be printed.

8. In computers, a … … is a program installed to control a particular type of printer.

9. Give the definitions to the following:

1) designs and images used in magazines, books, etc.;

2) output quality, measured in dots per inch;

3) a particular colour within the colour spectrum;

4) an ink powder used in laser printers and copiers;

5) set of characters that can be resized (enlarged or reduced) without introducing distortion;

6) a rectangular pattern of black lines of magnetic ink printed on an object so that its details can be read by a computer system;

7) surface that carries a reproduction of the image, from which the pages are printed;

8) in-between; middle;

9) a container that holds the ink in an ink-jet printer;

10) small needles that press on the inked ribbon to make the character on paper;

11) printer technology that produces text and pictures by hammering pins against a ribbon and the paper;

12) a language that tells a printer how to print a document;

13) a peripheral which combines a printer, a fax machine and photocopying and scanning capability into one device;

14) they use a wax-based ink while producing colour images;

analog data transmission to about 48 kilobits per second. Standard cable modems operate in a similar manner over cable television networks, which have a total transmission capacity of 30 to 40 megabits per second over each local neighbourhood "loop." (Like Ethernet cards, cable modems are actually local area network devices, rather than true modems, and transmission performance deteriorates as more users share the loop.) Asymmetric digital subscriber line (ADSL) modems can be used for transmitting digital signals over a local dedicated telephone line, provided there is a telephone office nearby – in theory, within 5,500 metres (18,000 feet) but in practice about a third of that distance. ADSL is asymmetric because transmission rates differ to and from the subscriber: 8 megabits per second "downstream" to the subscriber and 1.5 megabits per second "upstream" from the subscriber to the service provider. In addition to devices for transmitting over telephone and cable wires, wireless communication devices exist for transmitting infrared, radiowave, and microwave signals (from https://www.britannica.com/technology/computer/Output-devices).

8. Fill in the gaps with suitable words:

1. The differences in … are noticeable: the more dots per inch, the clearer the image.
2. A print resolution of between 600 … and 2,400 … ensured that even text as small as 2 pt. was legible.
3. Passengers with an electronic ticket will need a … of ticket confirmation or a boarding pass to be admitted to secured gate areas.
4. The key advance of recent years is printing speed: the latest generation of ink-jets prints black-and-white text at 15 … … … (…).

distributed facility combines aspects of both the centralized and the decentralized facilities: users have microcomputers with communication programs so that they may switch to the main computer from time to time. They have the choice of working independently or with the central computer. (from https://en.wikipedia.org/wiki/Information_system).

2. Match words with their definitions:

financial, Internet, electronic, print, design, microchips

1) tiny pieces of silicon containing complex electronic circuits;
2) to make or draw plans for something;
3) relating to money or how money is managed;
4) involving the use of electric current in devices such as TV sets;
5) the large system of connected computers around the world;
6) to produce text and pictures using a printer.

3. Choose the most suitable answer:

1. . … is the product of data processing.
a. data
b. information
c. software
d. a computer
e. none of the above
2. The most common input device used today is the … .
a. motherboard
b. central processing unit
c. keyboard
d. system unit
e. semiconductor
3. Software instructions intended to satisfy a user's specific processing needs are

called … .
a. systems software
b. a microcomputer
c. documentation
d. applications software
e. all of the above

4. Read and translate the text.

Parts of a computer

A computer is an electronic machine that accepts, processes, stores and outputs information. A typical computer consists of two parts: hardware and software.

Hardware: is any electronic or mechanical part of the com-puter system that you can see or touch.

The physical elements of a computer, its hardware, are generally divided into the central processing unit (CPU), main memory (or random-access memory, RAM), and peripherals. The last class encompasses all sorts of input and output (I/O) devices: keyboard, display monitor, printer, disk drives, network connections, scanners, and more.

The CPU and RAM are integrated circuits (ICs) – small silicon wafers, or chips, that contain thousands or millions of transistors that function as electrical switches. In 1965 Gordon Moore, one of the founders of Intel, stated what has become known as Moore's law: the number of transistors on a chip doubles about every 18 months. Moore suggested that financial constraints would soon cause his law to break down, but it has been remarkably accurate for far longer than he first envisioned. It now appears that technical constraints may finally invalidate Moore's law, since sometime between 2010 and 2020 transistors would have to consist of only a few atoms each, at which point the laws of quantum physics imply that they would cease to function reliably.

Software is a set of instructions called a program, which tells a computer what to do.*Software* denotes programs that run on computers. John Tukey, a statistician at Princeton

printers in most commercial settings. Laser printers employ a focused beam of light to etch patterns of positively charged particles on the surface of a cylindrical drum made of negatively charged organic, photosensitive material. As the drum rotates, negatively charged toner particles adhere to the patterns etched by the laser and are transferred to the paper. Another, less expensive printing technology developed for the home and small businesses is inkjet printing. The majority of inkjet printers operate by ejecting extremely tiny droplets of ink to form characters in a matrix of dots –much like dot matrix printers.

Computer display devices have been in use almost as long as computers themselves. Early computer displays employed the same cathode-ray tubes (CRTs) used in television and radar systems. The fundamental principle behind CRT displays is the emission of a controlled stream of electrons that strike light-emitting phosphors coating the inside of the screen. The screen itself is divided into multiple scan lines, each of which contains a number of pixels – the rough equivalent of dots in a dot matrix printer. The resolution of a monitor is determined by its pixel size. More recent liquid crystal displays (LCDs) rely on liquid crystal cells that realign incoming polarized light. The realigned beams pass through a filter that permits only those beams with a particular alignment to pass. By controlling the liquid crystal cells with electrical charges, various colours or shades are made to appear on the screen.

Communication devices

The most familiar example of a communication device is the common telephone modem (from modulator/demodulator). Modems modulate, or transform, a computer's digital message into an analog signal for transmission over standard telephone networks, and they demodulate the analog signal back into a digital message on reception. In practice, telephone network components limit

2. How is the screen size measured?
3. What technology is used by active-matrix LCDs?
4. Which unit of frequency is used to measure the brightness of a display?
5. What is Aspect Ratio? Which is the most common aspect ratio of computer displays?
6. What part inside the computer processes images and sends signals to the monitor?
7. What substance produces light and colour when hit by electrons in a CRT monitor?
8. What are the three advantages of OLED displays?

7. Read and translate the text.

Output Devices

Printers are a common example of output devices. New multifunction peripherals that integrate printing, scanning, and copying into a single device are also popular. Computer monitors are sometimes treated as peripherals. High-fidelity sound systems are another example of output devices often classified as computer peripherals. Manufacturers have announced devices that provide tactile feedback to the user – "force feedback" joysticks, for example. This highlights the complexity of classifying peripherals – a joystick with force feedback is truly both an input and an output peripheral.

Early printers often used a process known as impact printing, in which a small number of pins were driven into a desired pattern by an electromagnetic printhead. As each pin was driven forward, it struck an inked ribbon and transferred a single dot the size of the pinhead to the paper. Multiple dots combined into a matrix to form characters and graphics, hence the name *dot matrix*. Another early print technology, daisy-wheel printers, made impressions of whole characters with a single blow of an electromagnetic printhead, similar to an electric typewriter. Laser printers have replaced such

University and Bell Laboratories, is generally credited with introducing the term in 1958 (as well as coining the word *bit* for binary digit). Initially software referred primarily to what is now called system software – an operating system and the utility programs that come with it, such as those to compile (translate) programs into machine code and load them for execution. This software came with a computer when it was bought or leased. In 1969 IBM decided to "unbundle" its software and sell it separately, and software soon became a major income source for manufacturers as well as for dedicated software firms.

5. Match the terms with their definitions:

1 CD/DVD drive	A any socket into which a peripheral device may be connected
2 speaker	B device used to produce voice output and play back music
3 modem	C mechanism that reads and/or writes to optical discs
4 port	D device that converts data so that it can travel over the Internet
5 CPU (Central Processing Unit)	E a set of keys on a computer which you press to produce letters, numbers, etc.
6 keyboard	F the part of a computer that controls what it does
7 mouse	G the box of a computer that contains the hardware
8 case	H a small object connected to a computer, that you move with your hand and press to make the computer do things

6. Memorize the words:

to imply - мати на увазі
a mixture of integrated parts - суміш пов'язаних деталей
equipment - обладнання
to direct the processing of data - направляти обробку даних
to interact - взаємодіяти
application software - прикладне програмне забезпечення
internal resources - внутрішні ресурси

to run (execute programs) - запускати (виконувати) програми
to store data and programs - зберігати дані і програми
word processing - текстова обробка
payroll checks - перевірка платіжних відомостей
explore - досліджувати, вивчати
a pointing device - вказівний пристрій
to roll on the desktop - кататися (ковзати) на поверхні столу
to direct the insertion point (cursor) - направляти покажчик (курсор)
to glide the mouse - ковзати мишкою
to move in the direction of your movement - рухатися в напрямку вашого руху
to press and release the button one time - натиснути і відпустити кнопку один раз
the system unit - системний блок
to double-click the mouse - робити подвійне клацання мишею
to hold the processed information - містити оброблену інформацію
temporary storage - тимчасове сховище
if the electrical power is disrupted or cut off - якщо електрику переривається або відключається
the electrical power is on - електрику включено
to store permanently - зберігати постійно
the turning off the electrical power - вимикання електрики
to have much greater capacity - мати набагато більшу ємність
to access information - отримати доступ до інформації
to resemble - нагадувати
to display text characters - показувати текстові символи
image - зображення
to be made up of tiny dots - складатися з крихітних точок
resolution - роздільна здатність
to send and receive data - відправляти і отримувати дані
to convert the electronic signals - перетворювати електронні сигнали
external unit - зовнішній елемент

7. Give the Ukrainian equivalents for the following word combinations:

1. A long key at the bottom of the key-board. Each time it is pressed, it produces a blank space.
2. It moves the cursor to the beginning of a new line. It is also used to confirm commands.
3. It works in combination with other keys. For example, you press this key and C to copy the selected text.
4. It removes the character to the left of the cursor or any selected text.
5. It produces upper case characters.
6. It produces upper case letters, but it does not affect numbers and symbols.
7. It moves the cursor horizontally to the right for a fixed number of spaces (in tabulations and data fields).
8. They are used to move the cursor, as an alternative to the mouse.

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

1. The images shown on monitor are not generated by the video card.
2. All visible colours can be made from mixing the three primary colours of red, yellow and blue.
3. Typical CRT-based displays occupy less space than LCD displays.
4. Active-matrix LCDs do not use a technology called thin film transistor or TFT.
5. The size of the screen is measured horizontally.
6. Display Resolution, also known as dots per inch (DPI), this determines the number of pixels per linear inch.
7. CRTs are more expensive than LCDs, but they are heavy, can flicker and emit radiation.
8. LCDs offer better quality and take up less space, so they are replacing CRTs.

6. Answer the questions:

1. What do CRT and LCD stand for?

information can be stored in a multitude of formats depending on the user's requirement.

Voice input devices

Voice input devices are used to capture sound. In some cases, an audio output device can be used as an input device, in order to capture produced sound. Audio input devices allow a user to send audio info to a computer for processing, recording, or carrying out commands. Devices such as microphones allow users to speak to the computer in order to record a voice message or navigate software. Aside from recording, audio input devices are also used with speech recognition software (from https://en.wikipedia.org/wiki/Input_device).

2. Which input device (keyboard, mouse, light pen, scanner, trackball, joystick, graphics tablet, touch screen, barcode reader, touchpad, game controller, microphone, digital camera, webcam) would you use for these tasks?

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

3. Answer the questions:

1. What is an input device? What input devices do you know?
2. What groups of keys does a standard PC keyboard have?
3. What are the functions of dedicated keys?
4. What is a mouse?
5. What are mouse actions?

4. Give the definitions to the following:

1) custom programs might compute payroll checks; 2) to be contained on a single integrated circuit; 3) programs prewritten by professional programmers; 4) to imply a mixture of integrated parts working together; 5) to enable the application software to interact with the computer hardware; 6) more advanced applications; 7) to fall into five categories; 8) to look like a typewriter keyboard; 9) to direct the insertion point; 10) a browser to navigate, explore, and find information in the Internet; 11) to depend on the number and size of the pixels; 12) internal or external unit; 13) to distribute full-length motion pictures; 14) a protective sturdy plastic cover; 15) to be located on the tiny memory chips.

8. Read and translate the text.

Central processing unit

The CPU provides the circuits that implement the computer's instruction set—its machine language. It is composed of an arithmetic-logic unit (ALU) and control circuits. The ALU carries out basic arithmetic and logic operations, and the control section determines the sequence of operations, including branch instructions that transfer control from one part of a program to another. Although the main memory was once considered part of the CPU, today it is regarded as separate. The boundaries shift, however, and CPU chips now also contain some high-speed cache memory where data and instructions are temporarily stored for fast access.

The ALU has circuits that add, subtract, multiply, and divide two arithmetic values, as well as circuits for logic operations such as AND and OR (where a 1 is interpreted as true and a 0 as false, so that, for instance, 1 AND 0 = 0; *see* Boolean algebra). The ALU has several to more than a hundred registers that temporarily hold results of its computations for further arithmetic operations or for transfer to main memory.

The circuits in the CPU control section provide branch instructions, which make elementary decisions about what instruction to execute next. For example, a branch instruction might be "If the result of the last ALU operation is negative, jump to location A in the program; otherwise, continue with the following instruction." Such instructions allow "if-then-else" decisions in a program and execution of a sequence of instructions, such as a "while-loop" that repeatedly does some set of instructions while some condition is met. A related instruction is the subroutine call, which transfers execution to a subprogram and then, after the subprogram finishes, returns to the main program where it left off.

In a stored-program computer, programs and data in memory are indistinguishable. Both are bit patterns – strings of 0s and 1s – that may be interpreted either as data or as program instructions, and both are fetched from memory by the CPU. The CPU has a program counter that holds the memory address (location) of the next instruction to be executed.

At the end of these steps the cycle is ready to repeat, and it continues until a special halt instruction stops execution.

Steps of this cycle and all internal CPU operations are regulated by a clock that oscillates at a high frequency (now typically measured in gigahertz, or billions of cycles per second). Another factor that affects performance is the "word" size – the number of bits that are fetched at once from memory and on which CPU instructions operate. Digital words now consist of 32 or 64 bits, though sizes from 8 to 128 bits are seen.

Processing instructions one at a time, or serially, often creates a bottleneck because many program instructions may be ready and waiting for execution. Since the early 1980s, CPU design has followed a style originally called reduced-instruction-set computing (RISC). This design minimizes the

appears. Touchscreens and light pens involve direct input. Examples involving indirect input include the mouse and trackball.

- Whether the positional information is absolute (e.g. on a touch screen) or relative (e.g. with a mouse that can be lifted and repositioned)

For pointing devices, direct input is almost necessarily absolute, but indirect input may be either absolute or relative. For example, digitizing graphics tablets that do not have an embedded screen involve indirect input and sense absolute positions and are often run in an absolute input mode, but they may also be set up to simulate a relative input mode like that of a touchpad, where the stylus or puck can be lifted and repositioned. Embedded LCD tablets which are also referred to as graphics tablet monitors are the extension of digitizing graphics tablets. They enable users to see the real-time positions via the screen while using.

High-degree of freedom input devices

Some devices allow many continuous degrees of freedom as input. These can be used as pointing devices, but are generally used in ways that don't involve pointing to a location in space, such as the control of a camera angle while in 3D applications. These kinds of devices are typically used in virtual reality systems (CAVEs), where input that registers six degrees of freedom is required.

Composite devices

Input devices, such as buttons and joysticks, can be combined on a single physical device that could be thought of as a composite device. Many gaming devices have controllers like this. Technically mice are composite devices, as they both track movement and provide buttons for clicking, but composite devices are generally considered to have more than two different forms of input.

Video input devices

Video input devices are used to digitize images or video from the outside world into the computer. The

- whether the input is discrete (e.g. pressing of key) or continuous (e.g. a mouse's position, though digitized into a discrete quantity, is fast enough to be considered continuous)
- the number of degrees of freedom involved (e.g. two-dimensional traditional mice, or three-dimensional navigators designed for CAD applications)

Keyboard

A 'keyboard' is a human interface device which is represented as a layout of buttons. Each button, or key, can be used to either input a linguistic character to a computer, or to call upon a particular function of the computer. It acts as the main text entry interface for most users. Traditional keyboards use spring-based buttons, though newer variations employ virtual keys, or even projected keyboards. It is typewriter like device composed of a matrix of switches. There also happens to be another keyboard that is like an input device for musical instrument which helps to produce sound.

Computer Mouse

Pointing devices are the most commonly used input devices today. A pointing device is any human interface device that allows a user to input spatial data to a computer. In the case of mouse and touchpads, this is usually achieved by detecting movement across a physical surface. Analog devices, such as 3D mice, joysticks, or pointing sticks, function by reporting their angle of deflection. Movements of the pointing device are echoed on the screen by movements of the pointer, creating a simple, intuitive way to navigate a computer's graphical user interface (GUI).

Pointing devices, which are input devices used to specify a position in space, can further be classified according to:

- Whether the input is direct or indirect. With direct input, the input space coincides with the display space, i.e. pointing is done in the space where visual feedback or the pointer

transfer of data between memory and CPU (all ALU operations are done only on data in CPU registers) and calls for simple instructions that can execute very quickly. As the number of transistors on a chip has grown, the RISC design requires a relatively small portion of the CPU chip to be devoted to the basic instruction set. The remainder of the chip can then be used to speed CPU operations by providing circuits that let several instructions execute simultaneously, or in parallel.

There are two major kinds of instruction-level parallelism (ILP) in the CPU, both first used in early supercomputers. One is the pipeline, which allows the fetch-decode-execute cycle to have several instructions under way at once. While one instruction is being executed, another can obtain its operands, a third can be decoded, and a fourth can be fetched from memory. If each of these operations requires the same time, a new instruction can enter the pipeline at each phase and (for example) five instructions can be completed in the time that it would take to complete one without a pipeline. The other sort of ILP is to have multiple execution units in the CPU – duplicate arithmetic circuits, in particular, as well as specialized circuits for graphics instructions or for floating-point calculations (arithmetic operations involving noninteger numbers, such as 3.27). With this “superscalar” design, several instructions can execute at once.

Both forms of ILP face complications. A branch instruction might render preloaded instructions in the pipeline useless if they entered it before the branch jumped to a new part of the program. Also, superscalar execution must determine whether an arithmetic operation depends on the result of another operation, since they cannot be executed simultaneously. CPUs now have additional circuits to predict whether a branch will be taken and to analyze instructional dependencies. These have become highly sophisticated and

can frequently rearrange instructions to execute more of them in parallel.

(from https://www.britannica.com/technology/computer/).

9. Match the terms with their definitions:

1 Expansion cards	A handles all processor control signals. It directs all input and output flow, fetches code for in-structions from microprograms and directs other units and models by providing control and tim-ing signals.
2 motherboard	B determines how much data can be transmitted.
3 control unit (CU)	C extra circuit boards that are used to increase the functions of a computer.
4 arithmetic logic unit	D is a firm slotted board onto which computer circuitry is attached.
5 bus width	E is a major component of the central processing unit of a computer system. It does all processes related to arithmetic and logic operations that need to be done on instruction words.

10. Answer the questions:

1. What is the main function of a computers processor?
2. What unit of frequency is used to measure processor speed?
3. What are the main parts of the CPU?
4. What does ALU stand for? What does it do?
5. What is the function of the system clock?
6. What is a bus, backside bus, front-side bus?
7. What do you know about multiple processors?

11. Read and translate the text.

Main memory

The earliest forms of computer main memory were mercury delay lines, which were tubes of mercury that stored data as ultrasonic waves, and cathode-ray tubes, which stored data as charges on the tubes' screens. The magnetic drum,

18. Find the corresponding sentences in English in the text.

- Ми постійно знаходимося в напрузі, що і викликає у нас емоції.
- Недоліки очевидні.
- Я снідаю, слухаючи музику на Спотіфай.
- Безсумнівно, бути на зв'язку весь час має позитивні і от¬ріцательние боку.
- Постійне використання телефону - хвороба століття, особливо в раз¬вітих країнах.
- Смартфони і Інтернет є якби джерелом щастя, який знаходиться в нашій кишені.
- ... обмеження вторгнення мобільних телефонів, планшетів та інших пристроїв зв'язку в наше повсякденне життя.
- Програми можуть бути представлені в різній формі і мета кожної програми звернути увагу і енергію на продуктивну і приємну діяльність, і знову знайти задоволення в реальному житті.

LESSON 5

INPUT AND OUTPUT DEVICES

1. Read and translate the text.

Input devices

In computing, an input device is a piece of equipment used to provide data and control signals to an information processing system such as a computer or information appliance. Examples of input devices include keyboards, mouse, scanners, cameras, joysticks, and microphones.

Input devices can be categorized based on:

- modality of input (e.g. mechanical motion, audio, visual, etc.)

2. The case also contains _____for expansion boards.
3. _____ is a computer designed to fit comfortably on top of a desk, typically with the monitor sitting on top of the computer.
4. Desktop model computers are broad and low, whereas _____ computers are narrow and tall.
5. _____are laptops that are extremely thin (less than 20 millimeters), and lightweight along with long battery life, near instant-on and instant-resume capabilities, and fast storage, typically via SSDs, all in a sub $1,000 package.
6. _____computers cost about twice as much as equivalent regular-sized computers.

17. Fill in the gaps using the words from the list

Compressed, configured, devices, compatible, download, errors, mail, modem, packets, password, ports, printer, sysop, throughput, logged, protocol.

1. The *modem* connects to one of the serial, or COM, *ports* in your computer.
2. _____ If the system is not correctly it may halt, or you may find there are data _____
3. Hayes is recognized as the industry standard, and most _____ are Hayes _____ .
4. Data is split into _____ before it is sent down the line using a specific such as Zmodem.
5. When you are _____ to the system you will need to give a name and a_____ to enter.
6. Once you are _____on to a BBS you can chat with other users or send and receive _____and data.
7. If you have a modem with a low data e.g. 14400bps, it can take several hours to _moderately large files.
8. The (the person who runs the BBS) will generally store files in a format.

invented about 1948, used an iron oxide coating on a rotating drum to store data and programs as magnetic patterns.

In a binary computer any bistable device (something that can be placed in either of two states) can represent the two possible bit values of 0 and 1 and can thus serve as computer memory. Magnetic-core memory, the first relatively cheap RAM device, appeared in 1952. It was composed of tiny, doughnut-shaped ferrite magnets threaded on the intersection points of a two-dimensional wire grid. These wires carried currents to change the direction of each core's magnetization, while a third wire threaded through the doughnut detected its magnetic orientation.

The first integrated circuit (IC) memory chip appeared in 1971. IC memory stores a bit in a transistor-capacitor combination. The capacitor holds a charge to represent a 1 and no charge for a 0; the transistor switches it between these two states. Because a capacitor charge gradually decays, IC memory is dynamic RAM (DRAM), which must have its stored values refreshed periodically (every 20 milliseconds or so). There is also static RAM (SRAM), which does not have to be refreshed. Although faster than DRAM, SRAM uses more transistors and is thus more costly; it is used primarily for CPU internal registers and cache memory.

In addition to main memory, computers generally have special video memory (VRAM) to hold graphical images, called bitmaps, for the computer display. This memory is often dual-ported—a new image can be stored in it at the same time that its current data is being read and displayed.

It takes time to specify an address in a memory chip, and, since memory is slower than a CPU, there is an advantage to memory that can transfer a series of words rapidly once the first address is specified. One such design is known as synchronous DRAM (SDRAM), which became widely used by 2001.

Nonetheless, data transfer through the "bus" – the set of wires that connect the CPU to memory and peripheral

devices – is a bottleneck. For that reason, CPU chips now contain cache memory – a small amount of fast SRAM. The cache holds copies of data from blocks of main memory. A well-designed cache allows up to 85–90 percent of memory references to be done from it in typical programs, giving a several-fold speedup in data access.

The time between two memory reads or writes (cycle time) was about 17 microseconds (millionths of a second) for early core memory and about 1 microsecond for core in the early 1970s. The first DRAM had a cycle time of about half a microsecond, or 500 nanoseconds (billionths of a second), and today it is 20 nanoseconds or less. An equally important measure is the cost per bit of memory. The first DRAM stored 128 bytes (1 byte = 8 bits) and cost about $10, or $80,000 per megabyte (millions of bytes). In 2001 DRAM could be purchased for less than $0.25 per megabyte. This vast decline in cost made possible graphical user interfaces (GUIs), the display fonts that word processors use, and the manipulation and visualization of large masses of data by scientific computers (from https://www.britannica.com/technology/computer/).

12. Answer the questions:

1. What are three main memory circuit boards types? Which type is used more than others?
2. What type of memory is permanent and includes instructions needed by the CPU?
3. What is the difference between two main types of RAM?
4. How can RAM be increased?
5. What do you know about the BIOS?
6. What is a firmware?
7. What is a MaskROM?

13. Give the definitions to the following meanings:

1. Read-only memory
2. Random access memory (RAM)
3. Volatile/non-volatile

e) manufacturers

f) a portable computer

1. A device that is easily carriedor moved, especially because it is of alighter and smaller version than usual
2. A type of computer that is smallenough to fit on the top of a desk
3. Tools, machinery, and other du-rable equipment
4. Devices that are able to be at-tached to and used with a computer,though not an integral part of it.
5. People who purchase goods andservices for personal use
6. A person or company that makes goods for sale.

15. Ask questions to the sentences

1) Years ago notebook computers had a smaller display than a laptop.

2) A laptop is a small, portable computer, small enough to sit on your lap.

3) Today technology allows devices to be slimmer, smaller and better for mobile computing by design, so the size of portable computers (both in thickness and weight) is decreasing.

4) To be a more mobile device, the notebook was a thinner design and it weighed less than the laptop, simply because it didn't come packed with features and multiple devices and drives.

5) Many mobile computing manufacturers have actually dropped the term laptop completely from their product lineup in favor of the term notebook.

16. Fill in the gaps using the words from the list

maintenance, notebook, convertible, tower model, slate, desktop model, specs, ultrabooks, chassis, slots

1. Every computer system requires at least one _____ to house the circuit boards and wiring.

Today, technology allows devices to be slimmer, smaller and better for mobile computing by design, so the size of portable computers (both in thickness and weight) is decreasing. For this reason, options that once defined the difference between a laptop and notebook computer are separated by a small, almost invisible fine line today.

When we first compiled information for this article in 2008 there was still a difference between laptop and notebook computers. By 2012, however, we could see the term laptop used less frequently because a portable "comparable to desktop" system could easily lead to heat discomfort and possible injury if left in your lap for extended periods of time. By calling a laptop a notebook, it basically removes the association that device is well-suited to being used only on your lap. (from https://www.webopedia.com/insights/laptop-notebook/).

13. Answer the questions:

1) What kind of PC is a notebook?

2) Notebooks are very popular among children because they weigh less than six pounds, aren't they?

3) What techniques are used to produce a lightweight display screen?

4) Is it possible to run a notebook computerwithout plugging it in for 24 hours?

5) In what terms can modern notebook computers be equivalent to personal computers?

6) Batteries for notebook computers are expensive, aren't they?

14. Match words with definitions.

a) a desktop
b) hardware
c) peripherals
d) consumers

4. Dynamic random access memory (DRAM)
5. Narrow printed circuit board
6. Static RAM (SRAM)
7. Rewrite the data
8. Dual in-line package
9. SIMMs (single in-line memory modules)
10. DIMMs (dual in-line memory modules)
11. RIMMs (Rambus in-line memory modules)
12. BIOS (basic input/output system)
13. Essential for boot-up
14. Dual in-line memory modules (DlMMs)
15. To hold programs or software instructions
16. Embedded into a hardware device
17. Firmware
18. MaskROM (MROM)
19. Erasable programmable ROM (EPROM)

14. Read and translate the text.

Peripherals

Computer peripherals are devices used to input information and instructions into a computer for storage or processing and to output the processed data. In addition, devices that enable the transmission and reception of data between computers are often classified as peripherals.

Input devices

A plethora of devices falls into the category of input peripheral. Typical examples include keyboards, mice, trackballs, pointing sticks, joysticks, digital tablets, touch pads, and scanners.

Keyboards contain mechanical or electromechanical switches that change the flow of current through the keyboard when depressed. A microprocessor embedded in the keyboard interprets these changes and sends a signal to the computer. In addition to letter and number keys, most keyboards also include "function" and "control" keys that modify input or send special commands to the computer.

Mechanical mice and trackballs operate alike, using a rubber or rubber-coated ball that turns two shafts connected

to a pair of encoders that measure the horizontal and vertical components of a user's movement, which are then translated into cursor movement on a computer monitor. Optical mice employ a light beam and camera lens to translate motion of the mouse into cursor movement.

Pointing sticks, which are popular on many laptop systems, employ a technique that uses a pressure-sensitive resistor. As a user applies pressure to the stick, the resistor increases the flow of electricity, thereby signaling that movement has taken place. Most joysticks operate in a similar manner.

Digital tablets and touch pads are similar in purpose and functionality. In both cases, input is taken from a flat pad that contains electrical sensors that detect the presence of either a special tablet pen or a user's finger, respectively.

A scanner is somewhat akin to a photocopier. A light source illuminates the object to be scanned, and the varying amounts of reflected light are captured and measured by an analog-to-digital converter attached to light-sensitive diodes. The diodes generate a pattern of binary digits that are stored in the computer as a graphical image (from https://www.britannica.com/technology/computer/).

15. Agree or disagree with the statements using phrases of agreement and disagreement. If you disagree, give the correct variant.

1. System software is one of the kinds of application software.

2. The operating system interacts between the application software and the computer.

3. System software may be packaged or custom-made.

4. Packaged software is programs written for a specific purpose and for a specific organization.

5. One of the general-purpose programs is a browser to navigate, explore, and find information in the Internet.

computers. They have the same CPUs, memory capacity and disk drives. However, all this power in a small package is expensive.

Notebook computers come with battery packs that enable you to run them without plugging them in. However, the batteries need to be recharged every few hours.

A laptop is a small, portable computer — small enough that it can sit on your lap. Nowadays, laptop computers are more frequently called notebook computers, though technically laptops are somewhat larger in size than notebooks, in both thickness and weight.

The laptop was originally designed to be similar to a desktop, but be small and light enough to be used sitting in your lap. For this reason, years ago, you would find that a laptop had more features than notebooks did, but the trade-off was being larger and heavier than a notebook. This is because the notebook style of portable computers was for *mobility*, not *portability*. To be a more mobile device, the notebook was a thinner design and it weighed less than the laptop, simply because it didn't come packed with features and multiple devices and drives.

Years ago, notebook computers would have a smaller display than a laptop, fewer internal drives (hard drive or CD/DVD-ROM – depending on the year manufactured), and the sound, modem, and such would be integrated – not separate upgradable hardware devices. Laptops were considered to be desktop replacements; portable computers with features, functions, and options comparable to your desktop computer.

So while there technically is a difference between the two – and that is the size and weight of the device (which in turn impacts the system's features) – today there is even less of a difference between the two since technology advancements means that most common computer devices and peripherals are much smaller now.

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

2) a typical computer found in many businesses and popular for home use;

3) a large computer used for intensive data processing and of-ten linked to many terminals;

4) a small computer that fits into items of clothing;

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

6) a full-function PC, though it only weighs 1.1 kg – you can go to a meeting and write your notes on it, like a paper notepad; its screen mode can be changed from portrait to landscape.

11. Complete these sentences:

1. A computer … hardware and software.
2. Peripherals … three types: input, output and storage devices.
3. A word processing program … which lets the user create and edit text.
4. … of network architecture: peer-to-peer, where all compu-ters have the same capabilities, and client-server (e.g. the Internet), where servers store and distribute data, and clients access this data.
5. Digital computers can … into five main types: mainframes, desktop PCs, laptops, tablet PCs and handheld PDAs.

12. Read the text and answer the question:

What is the difference between a laptop and a notebook?

A notebook is an extremely light weight personal computer. Notebook **computers** typically weigh less than six pounds and are small enough to fit easily in a briefcase. Notebook computers use a variety of techniques, known as flat-panel **technologies**, to produce a lightweight and non-bulky display screen. In terms of computing power, modern notebook computers are nearly equivalent to personal

6. Microcomputer hardware consists of input devices, the system unit, secondary storage, output devices and communications devices.

7. The processor is often referred to as CPU.

8. The keyboard and the mouse are output devices.

9. Memory is a permanent storage.

10. Hard disk is a secondary storage device.

11. The capacity of floppy disks is far greater than CD's.

12. The monitor is an input device with the help of which you enter information into the computer.

13. A modem converts the electronic signals that can travel over a telephone line.

16. Match the words from right side with the statements with the words from left side.

hardware	the physical, electronic devices
software	a pointing device that rolls on the desktop
memory	"background software"
secondary storage	"end-user software"
system software	the programs
application software	temporary storage
a mouse	permanent storage
custom-made software	programs written for a specific purpose

LESSON 3
FUNCTIONS OF A COMPUTER

1. Read and translate the text.

The four functions of a computer actually explain the core reasons why it was built. They include:

– Data input.
– Data processing.
– Information output.
– Data and information storage.

Data Input

Every computer is designed with data input as a first function, an activity which is accomplished via input devices.

Data entry is done manually, automatically or both. Manual input is done via add-on peripherals like the keyboard, mouse and stylus. Input can also be accomplished via vocal dictation applica-tions and body gestures peripherals like Kinect and biometric de-vices.

Data may be entered into a database, spreadsheet or other forms of a computerized work area.

Data Processing

Data processing is the core function of a computer. Processing involves manipulation of raw data into before converting it into meaningful information. Usually, data is in raw form, and will thus undergo processing before dissemination for user consumption.

The ”brain” of the computer where data is processed is re-ferred to as the microprocessor. It is also commonly known as the central processing unit (CPU) or accelerated processing unit (APU).

Information Output

When raw data has been manipulated by the microprocessor, the outcome is meant to be disseminated for useful purposes. The output is thus referred to as information and is beneficial to the computer user.

Processed data or information can be:

– viewed as alphanumeric, images and video via a display hardware;
– listened to as audio files by use of a speaker;
– printed as hard copy output onto paper;
– printed as 3D models.

smaller screen. Modern notebooks have a TFT (Thin Film Transistor) screen that produces very sharp images.

Instead of a mouse, they have a touchpad built into the key-board – a sensitive pad that you can touch to move the pointer on the screen. They offer a lot of connectivity options: USB (Univer-sal Serial Bus) ports for connecting peripherals, slots for memory cards, etc.

They come with battery packs, which let you use the computer when there are no electrical outlets available.

A tablet PC looks like a book with an LCD-screen on which you can write using a special digital pen. You can fold and rotate the screen 180 degrees. Your handwriting can be recognized and converted into editable text. You can also type at the detached keyboard or use voice recognition. It’s mobile and versatile.

Pen-based which main input device is an electronic pen.

A personal digital assistant or PDA is a tiny computer which can be held in one hand. The term PDA refers to a wide variety of hand-held devices, palmtops and pocket PCs.

For input, you type at a small keyboard or use a stylus – a spe-cial pen used with a touch screen to select items, draw pictures, etc. Some models incorporate handwriting recognition, which ena-bles a PDA to recognize characters written by hand. Some PDAs recognize spoken words by using voice recognition software.

They can be used as mobile phones or as personal organizers for storing notes, reminders and addresses. They also let you ac-cess the Internet via wireless technology. Without cables.

Note that the term PC usually refers to an IBM compatible personal computer i.e. an Apple Mac personal computer is not re-ferred to as a PC. A computer that provides a service on a network e.g. storing files, sharing a printer, is known as a server computer. Server computers usually have a UPS (uninterruptible power sup-ply) attached to them. This is a battery that automatically provides an electricity supply to allow the server to shut itself down proper-ly if the main supply fails.

10. Which type of computer do these descriptions refer to?

8. Compose questions for the following answers

1. The Tianhe-1A
2. Over 2.5 thousand trillion operations a second
3. For processing satellite data, weather
4. Because it is prestigious
5. 7,000
6. Forecasts
7. Over 150 tons
8. Yes, it can
9. 14,000
10. 30 %
11. Japan did

9. Read and translate the text.

Types of computers

There are different types of computer of varying size and power, including the following:

Supercomputer is the most powerful type of mainframe.

Mainframe is large, very powerful, multi-user i.e. can be used by many people at the same time, multi-tasking i.e. can run many programs and process different sets of data at the same time. Main-frames are used for large-scale computing purposes in banks, big companies and universities.

Minicomputer is smaller than a mainframe, powerful, multi-user, multi-tasking.

Personal computer (PC) is designed for a single user.

Desktop computer has a suitable size for sitting on an office desk.

Workstation is the most powerful type of desktop computers, used for graphic design, etc.

Portable computer can be carried around, can operate with batteries.

Laptop is large portable, can be rested on user's lap. A laptop (also called a notebook PC which has a size of a sheet of notebook paper) is a lightweight computer that you can transport easily. It can work as fast as a desktop PC, with similar processor, memory, capacity and disk drives, but it is portable and has a

Data and Information Storage

The fourth and equally very important function of a computer is data and information storage. After sleepless nights of video and animation creation and editing, the user wants to have the finished product stored for future dissemination and additional editing.

A computer can store information internally and externally. The hard disk drive (HDD) and/or solid-state disk drive (SSD) are internal storage devices and serve to protect and house all data and information on a computer. In bigger systems, the RAID system is used. Multiple disk drives operate simultaneously to ensure data and information integrity.

External storage is achieved through accessories that attach externally to the computer. They include external drives and optical disks (from https://turbofuture.com/computers/The-Four-Functions-Of-A-Computer).

2. Remember the four functions of a computer and com-plete the following sentences:

1. Computer … is the visible or audible result of data processing – information that can be read, printed or heard by the user.

2. The CPU will process data as instructed by the programmes you're running. … includes functions like calculating, sorting, ed-iting, drawing and searching.

3. DVDs were expected to replace CDs as … devices twenty years ago.

4. As a scanner the Sigma-100 can be used to … photographs as well as documents into the computer.

3. Answer the questions:

1. What are the four functions of a computer?
2. Describe the first function of a computer.
3. What is a core function of a computer?
4. What are the ways of information output?

5. How can information be stored?

4. Complete the gaps with appropriate words:

A computer like any other machine is used because 1) _____ . It can receive more information and process it faster than any human. The speed at which a computer works means it can replace weeks or even months of pencil-and-paper work. Therefore computers are used when the time saved offsets their cost which is one of the many reasons 2) _____ .

Modern accounting firms use spreadsheet software to do complicated calculations. They can provide their clients with an up-to-date report 3)_____. This software has many functions and can be integrated with other software. The spreadsheet's basic component is a cell. This may contain a formula 4)_____ . It could also contain a label or data. The former describes the information on the worksheet. The latter is the information itself.

The worksheet is the basic work area of a spreadsheet program. It is made up of cells arranged in rows and columns. The number of these varies depending on the software you are using.

You can change the width and formatof cells. Such parameters are usually quite easy 5) _____ .

5. Put in right order.

- the computer, is, why, used, widely?
- speed, what, the computer, does, mean?
- do, what modern, use, account firms?
- the worksheet, what, is?

6. Translate the sentences.

1) Комп'ютери обробляють дані швидше і ефективніше, ніж людина.

2) Комп'ютери використовують в промисловості, якщо виграш за часом перевищує грошові витрати на їх

6) Minicomputers are (powerful) than workstations but (powerful) than mainframes.

7) Minicomputers are (small) than mainframes but (big) than workstations.

8) Large minicomputers are as powerful (as/ than) small mainframes.

9) A workstation has a (fast) microprocessor, a (large) amount of RAM than a PC.

10) PDA is (small) of the devices mentioned in the text.

7. Fill in the gaps with the suitable words from the list:

theoretical calculations, research, forecasts, graphic processors, supercomputer, perform, chips, store, weigh, replaced

Scientists in China have built the world's fastest computer. The Tianhe-1A can 1) _____ over 2.5 thousand trillion operations a second. With this new computer China has overtaken America in this section of technology. The Chinese 2)_____ is 30% faster than the fastest American computer. The Tianhe-1A has over 7,000 3)_____ processors and 14,000 Intel 4)_____ . The processors 5) _____over 150 tons. The computer can 6)_____ information equal to about a hundred million books. The new computer will be used for biomedical 7)_____, processing satellite data, weather 8)_____, development of new materials and 9)_____ in science. The Chinese have even more plans in computing technology. In the future American Intel chips are to be 10)____by Chinese home-made ones. The race for the world's fastest computer is a prestigious one. Before America got the title, Japan had the world's fastest computer. Seven of the world's top computers are in the USA, two are in China and one is in Germany (from https://www.english-online.at/news-articles/technology/china-builds-worlds-fastest-computer.htm).

4. Fill in the gaps with available words

1) Please call this number if you_____any further information.
2) A lot of money has been_____into research in that particular field.
3) We need to get an assistant who's _____and efficient.
4) Their report is deliberately_____ on future economic prospects.

5. Translate sentences and phrases using the vocabulary of the text.

1. Універсальна ЕОМ; робоча станція / дисплейний термінал; персональний цифровий асистент; кишеньковий / ручний комп'ютер; комп'ютер з пір'яним введенням даних
2. За останні роки стерлася відмінність між великим мінікомп'ютером і невеликою універсальною ЕОМ.
3. Персональний комп'ютер призначений для роботи і відпочинку.
4. В кишеньковий комп'ютер закладена функція розпізнавання рукописного тексту і голосових повідомлень.

6. Put the words in the brackets in correct forms

1) Supercomputer is the (fast) and (expensive) type of computer.
2) Mainframes are (expensive) than supercomputers.
3) Supercomputers are (good) at executing a few programs as fast as possible, whereas mainframes are (good) at executing many programs concurrently.
4) In some ways, mainframes are (powerful) than supercomputers because they support (many) simultaneous programs.
5) But supercomputers can execute a single program (fast) than a mainframe.

обслуговування.

3) Швидкість роботи комп'ютера дозволяє виконати за годину тижневий обсяг паперової роботи.

4) Основним елементом великоформатної електронної таблиці є комірка.

LESSON 4
CLASSES AND TYPES OF COMPUTERS

1. Read the text and answer the question:

Types of computers

Supercomputer

Supercomputer is the fastest type of computer. Supercomputers are very expensive and are employed for specialized applications that require immense amounts of mathematical calculations. Weather forecasting, animated graphics, fluid dynamic calculations, nuclear energy research, and petroleum exploration require a supercomputer.

Mainframe

Mainframe is a very large and expensive computer capable of supporting hundreds, or even thousands, of connected users simultaneously. In some ways, mainframes are more powerful than supercomputers because they support more simultaneous programs. But supercomputers can execute a single program faster than a mainframe.

Minicomputer

Minicomputer is a midsized computer. In size and power, minicomputers lie between workstations and mainframes. But in general, a minicomputer is a multiprocessing system capable of supporting from 4 to about 200 users simultaneously.

Microcomputer

The term microcomputer is generally synonymous

with personal computer (PC), or a computer that depends on a microprocessor. Microcomputers are designed to be used by individuals, whether in the form of PCs, workstations or notebook computers. A microcomputer contains a central processing unit (CPU) on a microchip (the microprocessor), a memory system (typically read-only memory (ROM) and random access memory (RAM)), a bus system and I/O ports, typically housed in a motherboard.

Workstation

Workstation is a computer intended for individual use that is faster and more capable than a personal computer. It's intended for business or professional use (rather than home or recreational use). Workstations and applications designed for them are used by small engineering companies, architects, graphic designers, and any organization, department, or individual that requires a faster microprocessor, a large amount of random access memory, and special features such as high-speed graphics adapters.

PDA

PDA is short for personal digital assistant, is a handheld device that combines computing, telephone/fax, Internet and networking features. A typical PDA can function as a cellular phone, fax sender, Web browser and personal organizer. PDAs may also be referred to as a palmtop, hand-held computer or pocket computer.

Unlike portable computers, most PDAs began as pen-based, using a stylus rather than a keyboard for input. This means that they also incorporated handwriting recognition features. Some PDAs can also react to voice input by using voice recognition technologies. PDAs are available in either a stylus or keyboard version.

Apple Computer, which introduced the Newton MessagePad in 1993, was one of the first companies to offer PDAs. As technology changed the world of mobile devices, the PDA has become obsolete as devices like touch-screen

smartphones and tablets grow in popularity.

2. Find the answers to the questions in the text: Which of the devices ...

1) is capable of supporting 300-3000 users simultaneously?
2) is intended for business or professional use?
3) can function as a cellular phone?
4) is used for animated graphics?
5) incorporates handwriting recognition features?
6) is used by small engineering companies?
7) is capable of supporting 15-150 users simultaneously?
8) is employed for specialized applications that require immense amounts of mathematical calculations?
9) has come out of use because of new technologies?
10) reacts to voice input by using voice recognition technologies?
11) is referred to as hand-held computer?
12) is used by graphic designers?
13) is used for nuclear energy research?
14) is used by architects?
15) is the fastest type of computers?

3. Match words with similar meaning and their translation:

1. need	a.capable
2. erform	b. direct
3. huge	c. require
4. concurrent	d. obsolete
5. channel	e. vague
6. able	f. immense
7. outmoded	g. simultaneous
8. blurred	h. execute