МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ
РОССИЙСКОЙ ФЕДЕРАЦИИ
Федеральное государственное автономное
образовательное учреждение высшего образования
«СЕВЕРО-КАВКАЗСКИЙ ФЕДЕРАЛЬНЫЙ УНИВЕРСИТЕТ»
Пятигорский институт (филиал) СКФУ

Методические указания

по выполнению практических работ
по дисциплине
«ИНОСТРАННЫЙ ЯЗЫК В СФЕРЕ ПРОФЕССИОНАЛЬНОЙ КОММУНИКАЦИИ»

для студентов направления подготовки
10.03.01 Безопасность компьютерных систем

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ВВЕДЕНИЕ

Дисциплина «Иностранный язык в сфере профессиональной коммуникации» ориентирована на

- развитие навыков понимания устной речи общей и профессиональной тематики, включая понимание речи носителей языка и восприятие речи с медиа-источников;
- понимание особенностей стилей общения в рамках деловых ситуаций и ситуаций повседневного общения;
- преодоление языкового барьера и улучшение навыков разговорного французского языка;
- повышение грамотности устной и письменной речи;
- расширение активного словарного запаса по тематике общего и делового французского языка;
- повышение общего уровня владения языком.

Таким образом, целью освоения дисциплины «Иностранный язык в сфере профессиональной коммуникации» является формирование у студентов компетенций УК-4 как средства, позволяющего обеспечить свои коммуникативно-познавательные потребности в сферах академической, профессиональной и социально-гуманитарной деятельности.

Процесс изучения дисциплины направлен на формирование таких компетенций как: овладение монологической, диалогической и письменной речью; основами самооценки уровня сформированности языковой, речевой и социокультурной компетенции и формирования потребности языкового самообразования.

В результате освоения дисциплины обучающийся должен
знать:
- лексику профессиональной направленности;
- нормы употребления лексики английского языка в профессиональной сфере;
- особенности грамматики профессионального английского языка;
- специфику иноязычной речевой культуры профессионального коллектива;
- особенности иноязычного речевого этикета;
уметь:
- осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке;
- читать и переводить специальную литературу для пополнения профессиональных знаний;
- использовать этикетные формулы приветствия, прощания, просьбы в рамках коммуникации в иноязычном профессиональном коллективе;
- формулировать письменные обращения на иностранном языке;
владеть:
- навыками профессионального общения на английском языке;
- способами пополнения профессиональных знаний из оригинальных источников на английском языке;
- навыком использования норм иностранного языка в межличностном и профессиональном общении;
- навыком иноязычного взаимодействия в письменной форме.

СОДЕРЖАНИЕ ПРАКТИЧЕСКИХ ЗАНЯТИЙ

Раздел 1. Information-Dependent Society / Информационно зависимое общество

Практическое занятие № 1.

Тема занятия: Computer Literacy/ Компьютерная грамотность

Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.
В результате освоения темы студент должен:
знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;
уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;
владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.
Актуальность темы: обусловлена необходимостью овладения компетенцией УК-4.

Теоретическая часть:

COMPUTER LITERACY

Informed citizens of our information-dependent society shoud be computer-literate, which means that they should be able to use computers as everyday problem-solving devices. They should be aware of the potential of computers to influence the quality of life.

There was a time when only priviliged people had an opportunity to learn the basics, called the three R's: reading, writing, and arithmetics. Now, as we are quickly becoming an information-becoming society, it is time to restate this right as the right to learn reading, writing and *computing*. There is little doubt that computers and their many applications are among the most significant technical achievements of the century. They bring with them both economic and social changes. "Computing" is a concept that embraces not only the old third R, arithmetics, but also a new idea — computer literacy.

In an information society a person who is computer-literate need not be an expert on the design of computers. He needn't even know much about how to prepare *programs* which are the instructions that direct the operations of computers. All of us are already on the way to becoming computer-literate. Just think of your everyday life. If you receive a subscription magazine in the post-office, it is probably addressed to you by a computer. If you buy something with a bank credit card or pay a bill by check, computers help you process the information. When you check out at the counter of your store, a computer assists the checkout clerk and the store manager. When you visit your doctor, your schedules and bills and special services, such as laboratory tests, are prepared by computer. Many actions that you have taken or observed have much in common. Each relates to some aspect of a data processing system.

Vocabulary

Computer literacy [kəm'pjutə 'litərəsi] — компьютерная грамотность

problem-solving device — устройство, обеспечивающее решение задачи

be aware of [biə'wɛərɔv] — понимать, сознавать
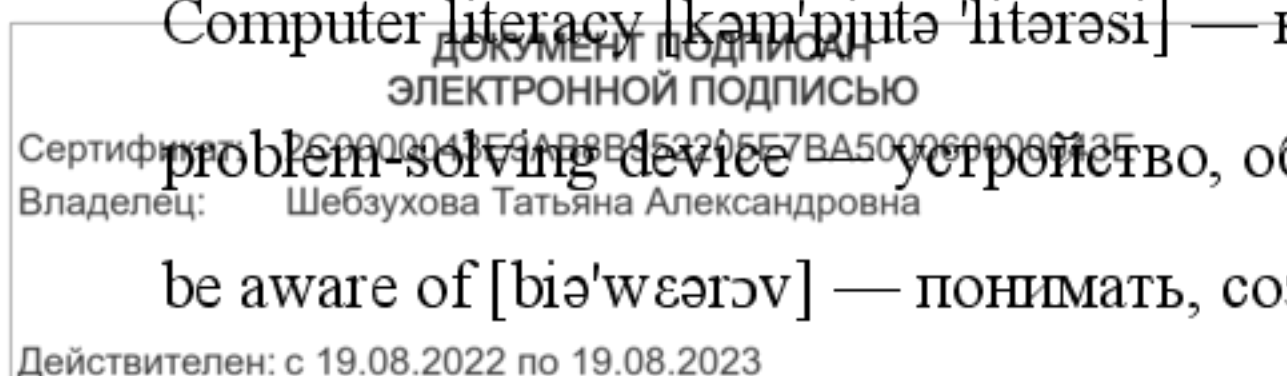
opportunity [ɔpə'tjuːniti] — возможность

basics ['beisiks] — основы

application [əpli'keiʃn] — применение; использование

to restate [ri'steit] — пересмотреть, переосмыслить

significant [sig'nifikənt] — значительный

achievement [ə'tʃiːvmənts] — достижения

computing [kəm'pjuːtiŋ] — вычисление; счет; работа на компьютере

to embrace [imb'reis] — охватывать

dimension [di'menʃn] — измерение

instruction [in'strʌkʃn] — команда, инструкция, указание

to direct the operation — направлятьработу

to process [prou'ses] — обрабатывать

subscription magazine [səb'skripʃhmægə'ziːn] — журналпоподписке

data processing system ['deitəprə'səsiŋ 'sistəm] — системаобработкиданных

store manager ['stɔː 'mænədʒə] — директормагазина

to have much in common — иметьмногообщего

Вопросы и задания:

1. Просмотрите текст еще раз. Ответьте на вопросы, используя информацию текста.

1. What does "a computer-literate person" mean? 2. Are you aware of the potential of computers to influence your life? 3. What do the people mean by "the basics"? 4. What is the role of computers in our society? 5. What is "computing"? 6. What is a program? 7. Prove that we all are on the way to becoming computer-literate. 8. Give examples of using computers in everyday life.

2. Прочтите, переведитеизапомнитеследующиевыражения:

An information-dependent society; a computer-literate citizen; an everyday problem-solving device; to be aware; to influence the quality of life; to have an opportunity; to learn the basics; to learn computing; the most significant technical achievements; to embrace computer literacy; to prepare programs; to direct the operations of a computer; to be on the way of becoming computer-literate; to process information; to have much in common; a data processing system.

3. Вспомните образование и случаи употребления ThePastSimpleTense.

А. Назовите три формы следующих неправильных глаголов:

To be; to have; to mean; to learn; to become; to bring; to know; to think; to buy; to pay; to take; to do; to begin; to give; to make;, to keep; to get; to read; to show.

Б. Преобразуйте следующие предложения в PastSimple.

1. Many people have an opportunity to use computers.
2. There is no doubt that computers solve problems very quickly.
3. Instructions direct the operation of a computer.
4. Computers bring with them both economic and social changes.
5. Computing embraces not only arithmetics, but also computer literacy.

6. It is well known that computers prepare laboratory tests.
7. Those persons are computer literate and think of buying a new computer.
8. They receive a subscription magazine once a month.
9. My mother is ill and visits her doctor every other day.
10. Experts know much about how to prepare programs.

4. Выберите правильный вариант из предложенных.
1. What is that? *[A — They / B — It / C — There]* is my computer.
2. My brother is *[A — one /B — a/C — an]* officer.
3. *[A — This/ B— These/C— That]* flowers are very beautiful.
4. Are *[A — those / B — that / C — there]* books interesting?
5. *[A — It has/B — It is/C — There is]* a dog in the garden.
6. I *[A — has / B— have / C— had]* to go to the library tomorrow.
7. Kate is here, but her parents *[A — isn't/ B — wasn't/C— aren't]*.
8. You ought *[A — stay/B— to stay/ C— staying]* at home.
9. He should/!4 — *write/ B— to write/ C— writing]* a letter.
10. Mike *[A — like/ B— likes/C — can]* to speak English.
11. I hope you've got *[A — a / B — any / C— some]* money.
12. Do you want *[A — know/ B— to know/C — knowing]* the news?
13. We've got *[A — a few/B— a little/C — a number]* apples left.
14. There aren't *[A — a lot/ B— many / C— much]* people here today.
15. *[A — Is/B— Has/ C— Does]* she get up early every day?
17. Were you in Moscow last year? — No, I *[A — didn't/B— weren't / C — wasn't]*.
18. I *[A — have never been /B — was never /C — am never being]* to Moscow yet.
19. *[A —Isn't/B — Doesn't/C— Hasn't]* she going to clean the room today?
20. The boys *[A — play / B — is playing /C — are playing]* football at the moment.
21. She *[A — caught/B— catches /C— will catch]* the 7. 30 train yesterday.
22. Kate *[A — loses/B— has lost/ C— lost]* her pencils very often.
23. *[A — Did you do/ B — Do you do/C — Have you done]* much work yesterday?
24. He *[A ~ hurries/B~ hurried/C — is hurrying]* because he was late.
25. Who is she looking *[A — on/B— at/C — to]*.
25. Our holidays are *[A — in / B— at/ C — on]* August.
26. What's the matter *[A — by/B — on/C — with]* him?
27. This book is *[A — my / B— me / C — mine]*.
28. Don't help him. He will do everything *[A — myself/ B— himself/ C — yourself]*.
29. We are playing *[A — ours / B — our/ C— us]* favourite game.
30. It is much *[A — warm / B — warmer/ C— more warm]* here.
31. She is not as old *[A — that / B — than /C — as]* I am.
32. Ann is *[A — very/B— more/C — much]* intelligent than Max.
33. Yesterday was the *[A — shortest/ B — most short/ C — very short]* day this year.
34. We'll listen to Professor's lecture and *[A — therefore/B -then/C — than]* we'll have a break.
35. He *is the [A ~very good/ B — best/C — better]* student in the group.

36. *[A — Where/B — Why/Q— Who]* wrote that letter?
37. She went home early *[A — because/B — while/C — till]* she had finished her work.
38. *[A - Who/ B - Where/C- When]* did you put my book?

39. *[A-How/B- Why/C- Where] is Bill?-Very well,* thanks.

40. He drives *[A — more careful / B — very carefully / C — very careful].*

5.Прочтитеипереведитетекст:

The Evolution of Artificial Intelligence

The evolution of artificial intelligenceis now proceeding so rapidly that by the end of the century cheap computers no larger than portable type-writers will exist that will be able to solve almost any problemfaster and more efficiently than we can.

"Intelligence" in a machine, as in a human, is best defined as the ability to solve complex problems swiftly. This may involve medical diagnosis and prescriptions, resolving legal matters or playing war-games: in other words advising governments whether or not to go to war.

While computers have already enhanced the deadliness of weapons, the prospect for the future is that they will play the more beneficial role of preventing wars, if asked to assess the chances of victory; the computer will analyze facts quite differently from the life-long military expert with his martial enthusiasm and ambitions.

When the same statistics are fed into the emotionless machine each to be weighed with cold objectivity and then assessed against each other, the answer, far more often than in human decision-making, will be "if you start this war you will lose". The computer cooly appraises the chances of success before the conflict begins, may well advise that the fight is unwinnable — or that the chances of victory are unacceptably low and needless disaster can be avoided.

At what point do we decide that their mental capacity is approaching the human level? This question will be answered by an ingenious trick known as the Turing Test.

We most easily assess people's intelligence by communicating with them. The late British mathematician, Alan Turing, proposed a simple test. A person would sit alone in a room talking by teleprinterwith two other beings elsewhere, one of them human and the other a computer. When after substantial conversation he no longer knew which was which, the computer would have passed the Turing Test, and arguably would have attained human intelligence.

No machine today comes near to passing the Turing Test. These are early days, however, and we may suspect that the rise of machine's IQ will be swift.

What will happen when this moment arrives? The most likely outcome is a world-wide slave empire, in which we are the masters and the computers virtually run the planet for us.

6. Опираясьнасодержаниепрочитанноготекста, закончитепредложения, используяпредлагаемыеварианты: by communicating with them; the planet for us; the Turing Test; swiftly; Test; advising governments whether or not to go to war; one of them human and the other a computer; approaching the human level.

1. "Intelligence" in a machine, as in a human, is best defined as the ability to solve complex problems…

2. This question will be answered by an ingenious trick known as…

3. We most easily assess people's intelligence…

4. No machine today comes near to passing the Turing…

5. The most likely outcome is a world-wide slave empire in which we are the masters and the computers virtually run…

6. This may involve medical diagnosis and prescriptions, resolving legal matters or playing war-games: in other words…

7. A person would sit alone in a room talking by teleprinter with two other beings else-where…

8. At what point do we decide that their mental capacity is…

7. Ответьтенавопросы:

1. How can the "intelligence" of a computer be defined best?

2. What does the Turing Test consist of?

3. Why do we decide that computer's mental capacity is approaching the human level?

4. Are you enthusiastic or skeptical about the planet "run by the computers"?

5. Do you agree that the evolution of artificial intelligence is now proceeding very rapidly? Givereasonsforyouranswer.

8. Подготовьте сообщение о разработках российских учёных в области искусственного интеллекта. Представьте своё сообщение в письменной форме.

Практическое занятие №2.
Тема занятия: ApplicationofComputers / Применение компьютеров

Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.

В результате освоения темы студент должен:

знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;

уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;

владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.

Актуальность темы: обусловлена необходимостью овладения компетенцией УК-4.

Теоретическаячасть:

WHAT IS A COMPUTER?

A computer is a machine with an intricate network of electronic circuits that operate switches or magnetize tiny metal cores. The switches, like the cores, are capable of being in one or two possible states, that is, on or off; magnetized or demagnetized. The machine is capable of storing and manipulating numbers, letters, and characters (symbols).

The basic idea of a computer is that we can make the machine do what we want by inputting signals that turn certain switches on and turn others off, or magnetize or do not magnetize the cores.

The basic job of computers is processing of information. For this reason computers can be defined as devices which accept information in the form of instructions, called a program, and characters, called data, perform mathematical and / or logical operations on the information, and then supply results of these operations. The program, or part of it, which tells the computers what to do and the data, which provide the information needed to solve the problem, are kept inside the computer in a place called memory.

It is considered that computers have many remarkable powers. However most computers, whether large or small, have three basic capabilities.

First, computers have circuits for performing arithmetic operations, such as: addition, subtraction, division, multiplication and exponentiation.

Second, computers have a means of communicating with the user. After all, if we couldn't feed information in and get results back, these machines wouldn't be of much use. Some of the most common methods of inputting information are to use terminals, diskettes, disks and magnetic tapes. The computer's input device (a disk drive or tape drive) reads the information into the computer. For outputting information two common devices used are: a printer, printing the new information on paper, and a cathode-ray-tube display, which shows the results on a TV-like screen.

Third, computers have circuits which can make decisions. The kinds of decisions which computer circuits can make are not of the type: "Who would win the war between two countries?" or "Who is the richest person in the world?" Unfortunately, the computer can only decide three things, namely: Is one number less than another? Are two numbers equal? and, Is one number greater than another?

A computer can solve a series of problems and make thousands of logical decisions without becoming tired. It can find the solution to a problem in a fraction of the time it takes a human being to do the job.

A computer can replace people in dull, routine tasks, but it works according to the instructions given to it. There are times when a computer seems to operate like a mechanical 'brain', but its achievements are limited by the minds of human beings. A computer cannot do anything unless a person tells it what to do and gives it the necessary information; but because electric pulses can move at the speed of light, a computer can carry out great numbers of arithmetic-logical operations almost instantaneously. A person can do the same, but in many cases that person would be dead long before the job was finished.

Vocabulary

intricate [ˈintrikit] — сложный, запутанный

electronic circuit [ələktˈkɔːnikˈsəːkit] — электроннаяцепь, схема

tooperateswitches [ɔpəˈreit ˈswitʃiz] — приводить в действие переключатели

to store numbers [ˈstɔː ˈnʌmbəz] — запоминатьчисла

to manipulate [məˈnipjuleit] — управлять; обращаться; преобразовывать

to input / to feed in — вводить (информацию)

to turn on = to switch on — включать

to turn off = to switch off— выключать

to process data [prouˈses ˈdeitə] — обрабатыватьданные

to supply [səˈplai] — подавать, вводить, снабжать, обеспечивать

addition [əˈdiʃn] — сложение

subtraction [sʌbˈtrækʃn] — вычитание

division [diˈviʒn] —деление

multiplication [ˈmʌltipliˈkeiʃn] — умножение

exponentiation [ekspəˈnenʃiˈeiʃn] — возведениевстепень

user [ˈjuːzə] — пользователь

input device [ˈinput diˈvais] — устройствоввода

diskdrive [ˈdisk ˈdraiv] — дисковое запоминающее устройство, дисковод

tapedrive [ˈteip ˈdraiv] — запоминающее устройство на магнитной ленте

cathode-raytube [ˈkæθədrei ˈtjuːb] — электроннолучевая трубка

to make decisions — принимать решения

instantaneously [´ɪnstən'teinjesli] — мгновенно, немедленно

to maintain records — вести учет

deposits and withdrawal — вклады и изъятие (выемка)

guidance — наведение (на цель); управление; руководство

on-board environment — бортовое окружение

pattern recognition — распознавание образов

Вопросы и задания:

1. Переведите текст. Ответьте на вопросы, используя информацию текста.

1. What is a computer? 2. What are the two possible states of the switches? 3. What are the main functions of a computer? 4. In what way can we make the computer do what we want? 5. What is the basic task of a computer? 6. In what form does a computer accept information? 7. What is a program? 8. What are data? 9. What is memory? 10. What three basic capabilities have computers? 11. What are the ways of inputting information into the computer? 12. What is the function of an input device? 13. What devices are used for outputting information? 14. What decisions can the computer make? 15. What are the computer's achievements limited by?

2. Найдите в тексте английские эквиваленты следующих словосочетаний, запишите их:

Сложная сеть электронных цепей; управлять (приводить в действие) переключателями; возможные состояния; хранить (запоминать) числа; обрабатывать символы; посредством ввода сигналов; включать; выключать; размагничивать сердечники; обработка информации; информация в виде команд; символы, называемые данными; выполнять математические операции; выдавать результаты; обеспечивать необходимую информацию; иметь замечательные возможности; основные свойства; сложение, вычитание, деление, умножение; возведение в степень; средства для общения с пользователем; устройство ввода; дисковод; считывать информацию; вывод информации; катоднолучевая трубка; принимать решения; выполнять тысячи логических операций; без устали; находить решение задачи; значительно меньший промежуток времени; человек; нудная рутинная работа; в соответствии с введенной программой; вырабатывать свои суждения; возможности ограничены программой, заложенной в него человеком; дать требуемую информацию; электрические импульсы; со скоростью света; мгновенно производить огромное количество математических операций; человеку может не хватить всей жизни, чтобы закончить работу.

3. Составьте пары или группы близких по значению слов из перечня, приведенного ниже.

Например: A. to perform, to exercise, to carry out; *B.* a man, a person, a human being;

Verbs: to turn on, to provide, to type, to accept, to help, to learn, to observe, to call, to tell, to keep, to feed, to solve, to relate, to switch off, to communicate, to receive, to supply, to switch on, to assist, to print, to study, to input, to turn off, to decide, to store, to say, to name, to watch.

Nouns: work, machine, fundamentals, display, application, capabilities, job, storage, screen, state, basics, use, concept, specialist, journal, character, memory, idea, expert, magazine, position, symbol, command, data, solution, device, instruction, powers, information, decision.

Adjectives: basic, tiny, common, small, main, significant, routine, general, remarkable, uninterested, intricate, important, wonderful, complex, little.

Adverbs: rapidly, probably, instantaneously, in a moment, quickly, perhaps.

4. Прочтитеипереведитетекст.

APPLICATION OF COMPUTERS

At present a great deal of the work force of most countries is engaged in creating, processing, storing, communicating and just working with information. Computers have become commonplace in homes, offices, stores, schools, research institutes, plants.

The use of computers in business, industry and communication services is widespread today. Computer-controlled robots are able to improve the quality of manufactured products and to increase the productivity of industry. Computers can control the work of power stations, plants and docks. They help in making different decisions and in management of economy.

The work of banks depends upon computer terminals for millions of daily operations. Without these terminals, records of deposits and withdrawals would be difficult to maintain, and it would be impossible to make inquiries about the current status of customer accounts.

Computers form a part of many military systems including communication and fire control. They are applied for automatic piloting and automatic navigation. Space exploration depends on computers for guidance, on-board environment and research.

Computers find application in astronomy and upper atmosphere research. Weather forecasting, library information services can benefit from computers too.

It is interesting to note that computers are widely used in medicine. They became valuable medical diagnostic tools. Computers are used for optical scanning and image processing, ranging from pattern recognition to image processing. Technicians can operate computer tomography scanners which combine x-rays with computer technology to give sectional views of the body of patients. The views then can be combined into a single image shown on the screen.

It should be noticed that learning on a computer can be fun. Students spend more time with computer-aided instruction performing the assigned task, as compared with conventional class-room.

At last air traffic control is impossible without computer application. It fully depends upon computer-generated information.

Many other uses of computers that we cannot imagine at present will become commonplace in the transition from an industrial to post industrial, or information society.

5. Выберите вариант, который лучше всего выражает главную идею текста WHATISACOMPUTER?

a) Computers are devices that accept information in the form of instructions.

в) The switches are usually in one of two states: magnetized or demagnetized.

c) Computers are remarkable devices serving for processing and storage the information and for solving problems.

6. Вставьте необходимые слова вместо пропусков.

1. Information is given into the computer in the form of _____.

   a) ideas; b) characters; c) rules

2. The basic function of a computer is____information.
   a) to switch; b) to keep; c) to process

3. The data needed for solving problems are kept in the _____.
   a) memory; b) input device; c) output device

4. Inputting information into the computer is realized by means of _____.
   a) a printer; b) letters; c) diskettes

5. A computer can carry out arithmetic-logical operations _____.
   a) quickly; b) instantaneously; c) during some minutes

6. Computers have become _____ in homes, offices, research institutes.
   a) commonwealth; b) commonplace; c) common room

7. Space uses computers widely.

a) information; b) production; c) exploration
8. Computers are used for image____.
   a) processing; b) operating; c) producing
9. Computers help in____of economy.
   a) invironment; b) management; c) government.

   10._____ Air traffic control depends on computer-
      _____ information.
   a) generated; b) instructed; c) combined

7. Подберите к терминам, данным в левой колонке, определения, представленные справа.

1. Computer   a) a machine by which information is received from the computer;
2. Data   b) a device capable of storing and manipulating numbers, letters and characters;
3. Input device c) an electronic machine that processes data under the control of a stored program;
4. Memory   d) a disk drive reading the information into the computer;
5. Output device e) information given in the form of characters.

8. Прочтите и переведите текст:

Application of Computers in Business

What is it that the computer can do especially for the manager? Although there are five major applications so far, most businesses only use the first.

The first application of the computer is a mechanical clerk handling large masses of repetitive, but simple, paperwork: payroll, billing, and so on. All that application really uses is the speed of the computer. It makes little use either of its memory or of its calculating capacity. The computer is being used as a large-scale, rapid printer. The second major use of the computer is for collecting, storing, analyzing and presenting information. It is this capacity of the computer that has led to the initials EDP, which stand for electronic data processing. The computer can take data, that is, information, in numerical form and can process it. Very little use is yet made in business of the computer's capacity to analyze. The computer can, if properly instructed, compare the data it receives against the data it has been told to expect, forinstance, budget figures. And it can immediately alert management if things do not go as expected.

The capacity of the computer to provide people with the information they need, in the form and the time they need it, is the great versatility of the tool, one so far not used too well by most businesses. It means that management has to think through what it needs.

The next obvious step is to the design of "geometry", that is, of physical structures. If one programmes into the computer all the considerations that go into designing a highway across country,and then further programmes into the computer the basic features of the country across which the highway has tobe built,the computer can, very rapidly, work out where the highway should go to take the fullest advantage of the physical and economiccharacteristics of the terrain. It can similarly work out many physical arrangements, particularly those inwhich a large mass of consideration has to be worked out into one optimal solution. Here the great capacity of the computer to handle largemasses of variables fast comesinto play.

The next major application of the computer is highly relevant to business. This is the computer's capacity to resolve a process to pre-set conditions - the capacity to "control" the process. If, for example, the computer has been programmed on the desired level of stocks and on the events that determine stock levels, such as volume of sales, volume of shipments, and so

on, the computer can take over control. It can report when stocks of a certain merchandise should be renewed. It can even print out the purchase order or, eventually, instruct the machine to turn out this or that particular kind of merchandise. It can order goods to be assembled for shipping to a customer. It can indeed, if that is desirable (and economical), actuate the machinery that would bring the goods together from their places on the shelves and in the bins and put them together in one shipping order. Finally, the computer will play an increasing part in the strategic decision-making of management - that is, in deciding what course of action to take in respect of the future. This is where the computer can "simulate". It can rapidly work out what would happen if certain things were done under certain assumptions. It cannotdetermine what the things might be that should be done. And it cannot determine the assumptions. Both have to be programmed into the computer. But it can tell management basic facts - that, say, the introduction of new product at such-and-such a price and such-and-such a cost would be justified if one can assume a certain volume of sales.

9. **Опираясьнасодержаниепрочитанноготекста,** **закончитепредложения, используяпредлагаемыеварианты:** collecting, storing, analyzing and presenting information;things do not go as expected; of it's calculating capacity; capacity to analyze; through what it needs; of physical structures; fast comes into play; stocks of a certain merchandise should be renewed.

1. It makes little use either of its memory or …

2. The second major use of the computer is for …

3. Very little use is yet made in business of the computer's …

4. And it can immediately alert management if …

5. It means that management has to think …

6. The next obvious step is to the design of "geometry", that is …

7. Here the great capacity of the computer to handle large masses of variables …

8. Itcanreportwhen …

10. Соответствуют ли следующие утверждения содержанию текста:

1. The computer is being used as a printer only.

2. The computer can compare the data it receives against the data it has been told to expect, for instance, budget figures.

3. Computers will play a diminishing part in the strategic decision-making.

11. Ответьтенавопросы:

1. What can the computer do if properly instructed?

2. When can the computer take over control?

3. What part will the computer play in the strategic decision-making of management?

4. What can the computer rapidly work out?

12. Вы – менеджер коммерческой фирмы. На семинаре для менеджеров поделитесь со своими коллегами из других фирм опытом использования компьютеров в бизнесе.

Практическое занятие № 3.

Тема занятия: DevelopmentofElectronics/ Развитие электроники

Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.

В результате освоения темы студент должен:

знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;

уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;

владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.

Актуальность темы: обусловлена необходимостью овладения компетенцией УК-4.

Теоретическаячасть:

DEVELOPMENT OF ELECTRONICS

Electronics is a field of engineering and applied physics dealing with the design and application of electronic circuits. The operation of circuits depends on the flow of electrons for generation, transmission, reception and storage of information.

Today it is difficult to imagine our life without electronics. It surrounds us everywhere. Electronic devices are widely used in scientific research and industrial designing, they control the work of plants and power stations, calculate the trajectories of space-ships and help the people discover new phenomena of nature. Automatization of production processes and studies on living organisms became possible due to electronics.

The invention of vacuum tubes at the beginning of the 20th century was the starting point of the rapid growth of modern electronics. Vacuum tubes assisted in manipulation of signals. The development of a large variety of tubes designed for specialized functions made possible the progress in radio communication technology before the World WarII and in the creation of early computers during and shortly after the war.

The transistor invented by American scientists W.Shockly, J.Bardeen and W.Brattain in 1948 completely replaced the vacuum tube. The transistor, a small piece of a semiconductor with three electrodes, had great advantages over the best vacuum tubes. It provided the same functions as the vacuum tube but at reduced weight, cost, power consumption, and with high reliability. With the invention of the transistor all essential circuit functions could be carried out inside solid bodies. The aim of creating electronic circuits with entirely solid-state components had finally been realized. Early transistors could respond at a rate of a few million times a second. This was fast enough to serve in radio circuits, but far below the speed needed for high-speed computers or for microwave communication systems.

The progress in semiconductor technology led to the development of the integrated circuit (1C), which was discovered due to the efforts of John Kilby in 1958. There appeared a new field of science — integrated electronics. The essence of it is batch processing. Instead of making, testing and assembling descrete components on a chip one at a time, large groupings of these components together with their interconnections were made all at a time. 1C greatly reduced the size of devices, lowered manufacturing costs and at the same time they provided high speed and increased reliability.

Vocabulary

applied physics — прикладнаяфизика

generation [dʒənə´reiʃn] — создание, формирование, выработка

scientific research [saiən´tifikri´ə:tʃ] — научныеисследования

due to the efforts [´dju: təðə ´efəts] — благодаряусилиям

manipulation [mænipju´leiʃn] — управление; обработка; преобразование

toreplacevacuumtubes — заменятьэлектронныелампы

a piece of semiconductor [´semikən´dʌktə] — полупроводниковыйкристалл

reduced weight [ri´dju:st ´weit] — уменьшенныйвес

power consumption [´pauəkən´sʌmpʃn] — потребление (расход) электроэнергии

to carry out [´kæriaut] — выполнять; осуществлять

solid body — твердое тело; кристалл; полупроводник

to respond [ri´spɔnd] — отвечать; реагировать

at a rate — со скоростью

integrated circuit (1C) [intə´greitid ´sə:kit] — интегральная схема

batch processing [´bætʃprou´sesiŋ] — пакетная обработка

to assemble [ə´sembl] — собирать; монтировать

to lower manufacturing [´louəmənju´fæktʃəriŋ] — снизить производительность

to increase reliability [´inkri:srilaiə´biliti] — увеличитьнадежность

Вопросы и задания:

1. **Просмотрите текст еще раз. Ответьте на вопросы, используя информацию текста.**

   1. What is electronics? 2. Can you imagine modern life without electronics? 3. Where are electronic devices used? 4. What was the beginning of electronics development? 5. What made the progress in radio communication technology possible? 6. What is the transistor? 7. When was the transistor invented? 8. What aim was realized with the invention of the transistor? 9. When were integrated circuits discovered? 10. What advantages did the transistors have over the vacuum tubes?

2. **Догадайтесь о значении следующих интернациональных слов и словосочетаний:**

   Electronics; electrons; physics; information; microelectronics; industrial design; to calculate trajectories; phenomena of nature; automatization of production processes; organisms; vacuum tubes; specialized functions; progress in radio communication technology; transistor; electrode; components; to realize; communication system; technology; descrete components; chip.

3. **Найдите в тексте английские эквиваленты следующих словосочетаний, запишите их:**

   Прикладная физика; передача и прием информации; поток электронов; трудно представить; научные исследования; промышленное проектирование; вычислять траекторию

космических кораблей; обнаруживать явления природы; благодаря электронике; отправная точка; способствовать управлению сигналами; быстрый рост; разнообразие ламп; создание первых компьютеров; полностью заменил; полупроводниковый кристалл; уменьшить вес; сократить стоимость; потребление электроэнергии; высокая надежность; твердотельные компоненты; довольно быстро... но гораздо ниже; высокоскоростной компьютер; микроволновые системы связи; полупроводниковая технология; область науки; интегральная схема; пакетная обработка; сборка дискретных компонентов на кристалле; снизить производственные затраты; обеспечить высокую скорость.

4. Переведите следующие «цепочки существительных». Запомните, что переводить ряд существительных, не связанных предлогами, следует, как правило, с конца. Запишитеивыучитеих.

Power consumption; power consumption change; signals manipulation; transistor invention; circuit functions; communication systems, data processing system; integrated circuits development; science field; process control; automatization processes control; circuit components; size reduction; electronics development; communication means; problem solution; space exploration; pattern recognition; customers accounts; air traffic control.

5.Прочтитеипереведитетекст:

Microelectronics and Microminiaturization

The intensive effort of electronics to increase the reliability and performance of its products while reducing their size and cost led to the results that hardly anyone could predict. The evolution of electronic technology is sometimes called a revolution: a quantitative change in technology gave rise to qualitative change in human capabilities. There appeared a new branch of science — microelectronics.

Microelectronics embraces electronics connected with the realization of electronic circuits, systems and subsystems from very small electronic devices. Microelectronics is a name forextremely small electronic components and circuit assemblies, made by film or semiconductor techniques. A microelectronic technology reduced transistors and other circuit elements to dimensions almost invisible to unaided eye. The point of this extraordinary miniaturization is to make circuits long-lasting, low in cost, and capable of performing electronic functions at extremely high speed. It is known that the speed of response depends on the size of transistor: the smaller the transistor, the faster it is. The smaller the computer, the faster it can work.

One more advantage of microelectronics is that smaller devices consume less power. In space satellites and spaceships this is a very important factor.

Another benefit resulting from microelectronics is the reduction of distances between circuit components. Packing density increased with the appearance of small-scale integrated circuit, medium-scale 1C, large-scale 1C and very-large-scale 1C. The change in scale was measuredby the number of transistors on a chip. There appeared a new type of integrated circuits, microwave integrated circuit. The evolution of microwave 1C began with the development of planar transmission lines. Then new 1Ccomponents in a fineline transmission line appeared. Other more exotic techniques, such as dielectric waveguide integrated circuits emerged.

Microelectronic technique is continuing to displace other modes. Circuit patterns are being formed with radiation having wavelength shorter than those of light.

Electronics has extended man's intellectual power. Microelectronics extends that power still further.

Vocabulary

performance [pə´fɔ:məns] — рабочая характеристика; параметры; производительность; быстродействие

to predict [prə´dikt] — прогнозировать

capability [keipə´biliti] — способность; возможность

branch of science [´bra:ntʃəv ´saiəns] — областьнауки

to embrace [im´breis] — охватывать

circuit assembly [´sə:kitə´sembli] — сборкасхемы

film technique [´film tək´nik] — пленочнаятехнология (метод, способ)

invisibletounaidedeye — невидимый невооруженному глазу

toreact [ri´ækt] — реагировать

speedofresponse — скорость реакции (отклика)

advantage / disadvantage [əd´va:ntidʒ] — достоинство, преимущество / недостаток

benefit [´benəfit] — выгода, польза; помогать, приносить пользу

to result from [ri´zʌltfrəm] — возникать, происходить в результате

packing density [´pækiŋ ´densiti]— плотность упаковки

small-scale integrated circuit — малаяинтегральнаясхема (МИС)

medium-scaleIC — средняя интегральная схема (СИС)

large-scaleIC — большая интегральная схема (БИС)

very-large-scaleIC — сверхбольшая интегральная схема (СБИС)

fineline [´fainlain] — прецизионный; с элементами уменьшенных размеров

transmission line — линия передачи

waveguide [´weivgaid] — волновод

toemerge [i´mə:dʒ] — появляться, возникать

todisplace — перемещать, смещать

mode — вид, метод, способ; режим работы

pattern — шаблон, образец; образ, изображение

power [´pauə] — мощность, энергия, питание; производительность, быстродействие; способность, возможность

6. Просмотрите текст еще раз и ответьте на вопросы, используя информацию текста.

1. What would you say about electronics? 2. Why is the development of electronics called a revolution? 3. What is microelectronics? 4. What techniques does microelectronics use? What

is the benefit of reducing the size of circuit elements? What do you understand by the term of microminiaturization? 7. What does the speed of the signal response depend on? 8. What advantages of microelectronics do you know? 9. What scales of integration are known to you? 10. How are microelectronics techniques developing?

7. Найдите в тексте английские эквиваленты следующих словосочетаний, запишите их:

Интенсивные усилия; увеличить надежность; увеличить параметры; уменьшить размер и стоимость; вряд ли кто-нибудь мог прогнозировать; количественные и качественные изменения; область науки; пленочная технология; полупроводниковый метод; сокращать элементы схемы; суть миниатюризации в том, что; создать схемы с долгим сроком службы; чрезвычайно высокая скорость реакции; чем меньше, тем быстрее; преимущество; расходовать энергию; польза; уменьшение расстояния между элементами схемы; большая интегральная схема; микроволновая интегральная схема; волновод; линия передач; смещать; изображение схем; расширять возможности человека.

8. Переведите следующие слова. Обратите внимание на то, что префиксы *dis-, in-, un-,* *non-, ir-* придают словам отрицательное значение.

dis-: disadvantage; disconnect; disappear, disclose; discomfort; discontinue; discount; discredit; discriminate; disintegrate.

in-: invisible; inaccurate; inactive; incapable; incompact; insignificant; inhuman; informal; ineffective; indifferent; indecisive; inconsumable; incorrect.

un-; uncontrollable; unbelievable; unable; unchanged; uncomfortable; uncommunicative; undisciplined; unexpected; unfavourable; unforgettable; unkind.

non-: non-effective; non-aggressive; noncomparable; non-computable; nonconstant; noncontrollable; nondigital; nondi-mensional; nonprogrammable; nonusable.

ir-; irregular; irrelative; irresponsive; irrational; irreplaceable; irrecognizable.

9. Вспомните образование страдательного залога: глагол to be (в нужном времени) + 3-я форма смыслового глагола.

А. Найдите пять случаев употребления страдательного залога в тексте MICROELECTRONICS AND MICROMINIATURIZATION *и четыре случая — в тексте 2. Переведите предложения.*

Б. Преобразуйте следующие предложения действительного залога в страдательный по образцу:

People widely *use* electronic devices – Electronic devices are widely *used* by people.

1. Electronic devices control the work of power stations. 2. They calculate the trajectories of spaceships. 3. People discover new phenomena of nature due to electronic devices. 4. Scientists designed a variety of tubes for specialized functions. 5. American scientists invented the transistor in 1948. 6. Integrated circuits greatly reduced the size of devices. 7. New types of integrated circuits increased packing density. 8. Electronics has extended man's intellectual power. 9. Scientists are looking for new ways for the improvement of integrated circuits technology. 10. Jack Kilby developed the concept of integrating de vice and built the first 1C in 1958.

10. Прочтите текст (по вариантам) и озаглавьте его. Выполните письменный перевод текста по вариантам.

* * *

1. It is well known that the quick development of electronics began with the invention of transistors. They replaced electronic tubes due to their numerous advantages. One of the main advantages of the transistors in comparison with the vacuum tube is absence of filament power loss. One of the principal causes of damages in electronic circuitry is high temperature. The heat
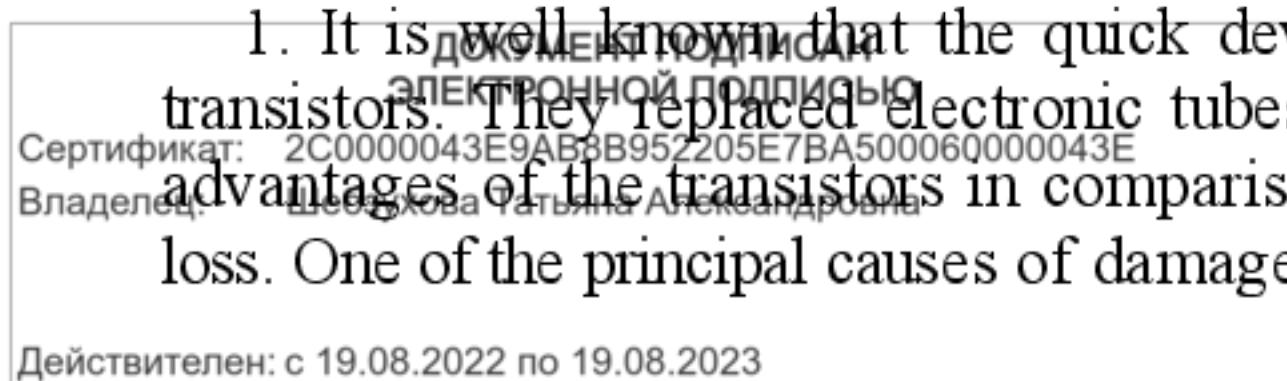
causes breakdown of tubes and other circuit elements that are very sensitive to this influence. The transistor, on the other hand, does not heat its surroundings.

Another advantage of the transistor is its long life. The life of the average transistor is more than ten thousand operating hours. Because of its long lifetime and raggedness, the transistor is very reliable and has much better efficiency in professional equipment.

2. As we know, transistors replaced electronic tubes due to their numerous advantages. One of the advantages of the transistor is its small dimensions. Because of their small size, the absence of heating and other properties, transistors make it possible to produce compact, small-dimensioned electronic devices which consume very little power.

In conclusion it is important to note that transistors revolutionized many fields of technology. They are successfully used for direct transformation of heat energy by means of thermal elements. They are also used to convert radiant energy into electricity with the help of photocells or solar batteries. Light sources and lasers are built on the basis of transistors. They find wide application in computers, automatic devices, aviation, communication, etc.

*Notes*_____

Filamentpowerloss — отсутствие энергии на нити накала

11. Вставьте необходимые слова вместо пропусков.

1. Transistors have many____over vacuum tubes.
   a) patterns; b) advantages; c) scales
2. They_____very little power.
   a) consume; b) generate; c) embrace
3. An integrated circuit is a group of elements connected together by some circuit____technique.
   a) processing; b) assembly; c) manipulation

4. The transistor consists of a small piece of a__...... with three electrods.
   a) diode; b) conductor; c) semiconductor.
5. Modern.......began in the early 20th century with the invention of electronic tubes.
   a) miniaturization; b) electronics; c) microelectronics
6. John Fleming was the_____of the first two-electrode vacuum tube.
   a) generator; b) receiver; c) inventor
7. One of the transistor advantages was lower power......, in comparison with vacuum tubes.
   a) consumption; b) reception; c) transmission.
8. Microelectronics greatly extended man's intellectual
   _____
   a) subsystems; b) capabilities; c) dimensions

12. Раскройте скобки и выберите глагол в требуемом залоге: действительном или страдательном.

1. Electronic devices (help; are helped) people discover new phenomena of nature. 2. The transistor (replaced; was replaced) by vacuum tubes thanks to its numerous advantages. 3. Due to transistors all circuit functions (carried out; were carried out) inside semiconductors. 4. Electronic devices (use; are used) in scientific research. 5. Before the invention of the transistor its function (performed; was performed) by vacuum tubes. 6. The reliability of electronic systems (connect; is connected) with the number of descrete components. 7. Semiconductor integrated circuits (helped; were helped) to increase reliability of devices. 8. New types of integrated circuits (have developed; have been developed) lately.

Практическое занятие № 4.
Тема занятия: TheFirstCalculatingDevices / Первые вычислительные машины

Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.

В результате освоения темы студент должен:

знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;

уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;

владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.

Актуальность темы: обусловлена необходимостью овладения компетенцией УК-4.

Теоретическаячасть:
TheFirstCalculatingDevices

Let us take a look at the history of computers that we know today. The very first calculating device used was the ten fingers of a man's hands. This, in fact, is why today we still count in tens and multiples of tens.

Then the abacus was invented. People went on using some form of abacus well into the 16th century, and it is still being used in some parts of the world because it can be understood with-out knowing how to read.

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

Calculus, another branch of mathematics, was independently invented by both Sir Isaak Newton, an Englishman, and Leibnitz, a German mathematician. The first real calculating machine appeared in 1820 as the result of several people's experiments.

In 1830 Charles Babbage, a gifted English mathematician, proposed to build a general-purpose problem-solving machine that he 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, except for providing the machine with the necessary facts about the problem to be solved. He never finished this work, but many of his ideas were the basis for building today's computers.

By the early part of the twentieth century electromechanical machines had been developed and were used for business data processing. Dr. Herman Hollerith, a young statistician from the US Census Bureau successfully tabulated the 1890 census. Hollerith invented a means of coding the data by punching holes into cards. He built one machine to punch the holes and others — to tabulate the collected data. Later Hollerith left the Census Bureau and established his own tabulating machine company.
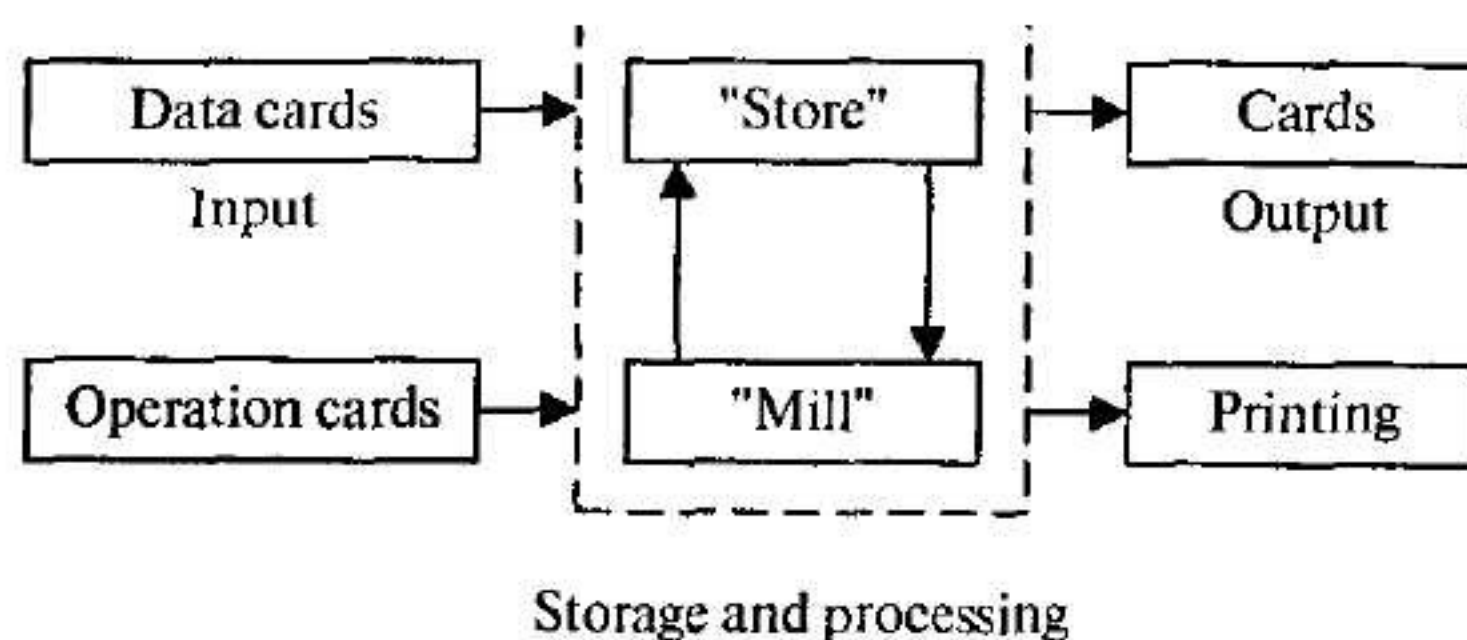
Storage and processing

Fig. 2. Ch. Babbage's analytical engine

Through a series of merges the company eventually became the IBM Corporation.

Until the middle of the twentieth century machines designed to manipulate punched card data were widely used for business data processing. These early electromechanical data processors were called unit record machines because each punched card contained a unit of data.

In the mid—1940s electronic computers were developed to perform calculations for military and scientific purposes. By the end of the 1960s commercial models of these computers were widely used for both scientific computation and business data processing. Initially these computers accepted their input data from punched cards. By the late 1970s punched cards had been almost universally replaced by keyboard terminals. Since that time advances in science have led to the proliferation of computers throughout our society, and the past is but the prologue that gives us a glimpse of the nature.

Vocabulary

calculating device [kəlkjuːˈleitiŋdiˈvais] — вычислительноеустройство

multiple [ˈmʌltiplj — кратный

abacus [ˈæbəkəs] — счеты

slide rule [ˈslaid ˈnruːl] — логарифмическаялинейка

logarithm table [ˈlɔgəriθm ˈteibl] — логарифмическаятаблица

calculus[kælkjːləs] — исчисление; математический анализ

general-purpose [ˈdʒenərə ˈpəːpas] — общего назначения, универсальный

to cut out the human being altogether — полностьюисключитьчеловека

tomanipulate [məˈnipjuleit] — обрабатывать, преобразовывать; управлять

dataprocessing [ˈdeitəpreˈsesiŋ] — обработка данных (информации)

tabulate the census — занести данные по переписи (населения) в таблицу

means of coding [ˈmiːnzəv ˈkoudiŋ] — средства кодирования (шифровки)

to punch the holes [ˈpʌntʃ ðe ˈhoulz] — пробиватьотверстия

punched card [ˈpʌʃt ˈkaːd] — перфокарта

to perform [pəˈfɔːm] — выполнять, производить (действие); осуществлять;

unit of data [ˈjuːnitəv ˈdeitə] — единица информации

keyboardterminals — терминал (вывод) с клавишным управлением

proliferation [prə'lifə'reiʃn] — размножение, быстрое увеличение

Вопросы и задания:

1.Просмотрите текст еще раз. Ответьте на вопросы, используя информацию текста.

1. What was the very first calculating device? 2. What is the abacus? 3. What is the modern slide rule? 4. Who gave the ideas for producing logarithm tables? 5. How did Newton and Leibnitz contribute to the problem of calculation? 6. When did the first calculating machine appear? 7. What was the main idea of Ch.Babbage's machine? 8. How did electromechanical machines appear and what were they used for? 9. What means of coding the data did Hollerith devise? 10. How were those electromechanical machines called and why? 11. What kind of computers appeared later? 12. What new had the computers of 1970s?

2. Найдите в тексте английские эквиваленты следующих словосочетаний:

Вычислительное устройство; легкий способ вычисления; поэтому (вот почему); кратное десяти; изобрести механический способ умножения и деления; логарифмическая линейка; составить таблицы логарифмов; математический анализ; изобрести независимо (друг от друга); в результате; полностью исключить человека; кроме (за исключением); обработка деловой информации; средство кодирования информации; перфокарты; пробивать отверстия; оформить собранные данные в таблицу; работать с данными на перфокарте; устройство, записывающее информацию блоками; единица информации; выполнять вычисления; для научных целей; клавишный терминал

3. Вспомните значение следующих глаголов и подберите к ним производные. Например: to calculate — calculating, calculator, calculation.

To compute, to invent, to know, to multiply, to divide, to depend, to solve, to provide, to process, to code, to punch, to collect, to design, to store, to contribute, to use, to manipulate, to assemble, to connect, to consume, to rely, to divide, to multiply, to inform, to instruct, to discover, to operate.

4. Переведите словосочетания, содержащие:

А. Причастие I — ParticipleI

Computers using vacuum tubes; the machine calculating mathematical problems; the computer keeping instructions in its memory; binary code storing data and instructions; the vacuum tube controlling and amplifying -electronic signals; computers performing computations in milliseconds; electronic . pulses moving at the speed of light; students coding the information by using a binary code; devices printing the information; keyboard terminals replacing vacuum tubes.

Б. Причастие II — Participle II

The given information; the name given to the machine; the coded data; the device used in World War II; the invention named ENIAC; the machine called EDVAC; instructions kept in the memory; the engine designed for storing data; data stored in a binary code; vacuum tubes invented by J. Neumann; the general-purpose machine proposed by Ch. Babbage; the machine provided with the necessary facts.

5. Прочтите и переведите текст:

The First Computers

In 1930 the first *analog* computer was built by American named Vannevar Bush. This device was used in World War II to help aim guns.

Many technical developments of electronic *digital* computers took place in the 1940s and 1950s. Mark I, the name given to the first digital computer, was completed in 1944. The man
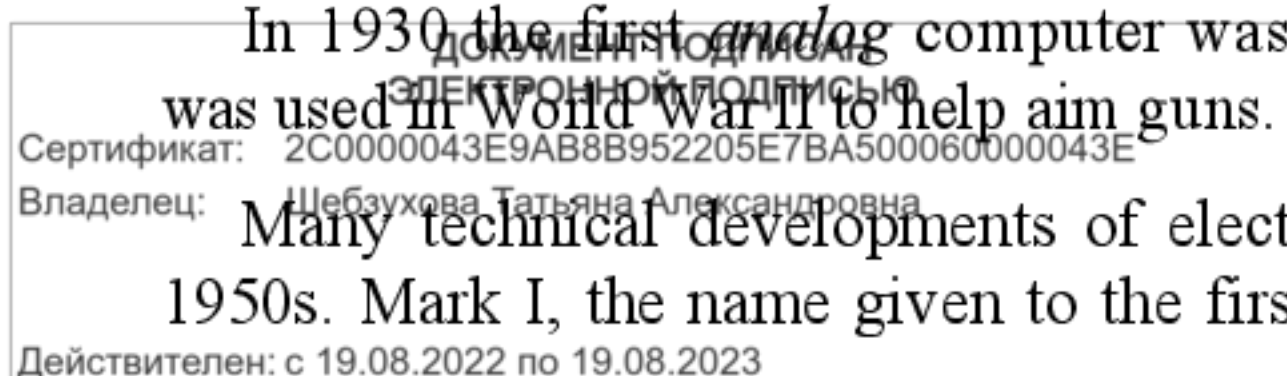
responsible for this invention was Professor Howard Aiken. This was the first machine that could figure out long lists of mathematical problems at a very fast rate.

In 1946 two engineers at the University of Pennsilvania, J.Eckert and J.Maushly, built their digital computer with vacuum tubes. They named their new invention ENIAC (the Electronic Numerical Integrator and Calculator).

Another important achievement in developing computers came in 1947, when John von Neumann developed the idea of keeping instructions for the computer inside the computer's memory. The contribution of John von Neumann was particularly significant. As contrasted with Babbage's analytical engine, which was designed to store only data, von Neumann's machine, called the Electronic Discrete Variable Computer, or EDVAC, was able to store both data and instructions. He also contributed to the idea of storing data and instructions in a *binary code* that uses only ones and zeros. This simplified computer design. Thus computers use two conditions, high voltage, and low voltage, to translate the symbols by which we communicate into unique combinations of electrical pulses. We refer to these combinations as codes.

Neumann's stored program computer as well as other machines of that time were made possible by the invention of the vacuum tube that could control and amplify electronic signals. Early computers, using vacuum tubes, could perform computations in thousandths of seconds, called milliseconds, instead of seconds required by mechanical devices.

Vocabulary

analog computer [ə'næləgkəm'pju:tə] — аналоговыйкомпьютер

digital computer ['didʒitəl] — цифровойкомпьютер

to aim guns ['eim 'gʌnz] — наводитьорудиянацель

to figure out ['figəraut] — вычислять

at a fast rate [ətə 'fa:st 'reit] — свысокойскоростью

memory / storage ['meməri'stɔndʒ] — запоминающееустройство

to store data and instructions — запоминатьинформациюикоманды

stored program computer — компьютер с занесенной в память программой

binary code ['bainəri'koud] — двоичный код

condition [kan'diʃn] — режим, состояние, условие

vacuum tube ['vækjuəmtju:b] — электронная (вакуумная) трубка (лампа)

to amplify ['æmplifai] — усиливать

to perform computations [pə'fɔ:mkəmpju'teiʃn] — выполнятьвычисления

6. Просмотрите текст еще раз и ответьте на вопросы, используя информацию текста.

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
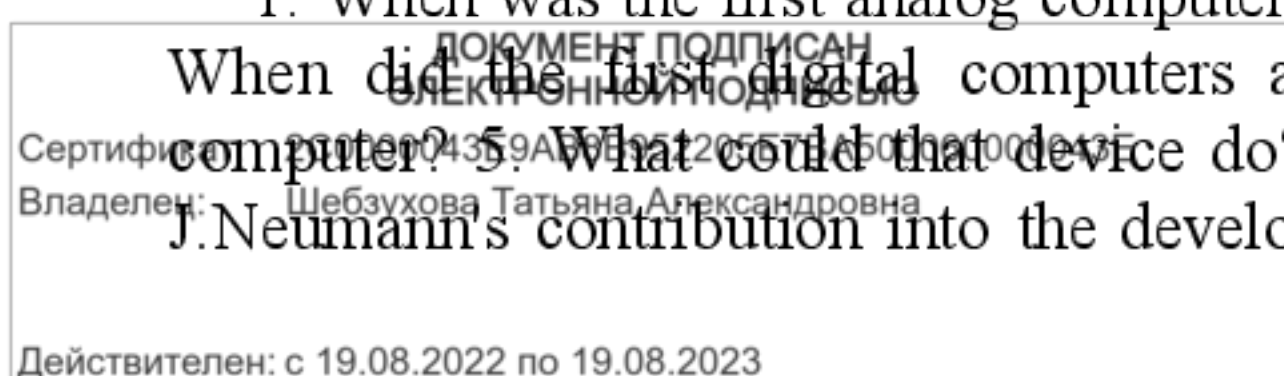
EDVAC in comparison with ENIAC? 9. What does binary coda mean? 10. Due to what invention could the first digital computers be built?

7. Найдите в тексте английские эквиваленты следующих словосочетаний.

Цифровые компьютеры; технические усовершенствования; совершенствование компьютеров; ответственный за изобретение; математические задачи; электронные трубки; важное достижение; запоминающее устройство; значительный вклад; двоичный код; высокое напряжение; низкое напряжение; электрические импульсы; тысячная доля секунды.

Происходить; завершать; вычислять; хранить команды внутри компьютера; запоминать информацию; запоминать команды; содействовать; использовать единицу и ноль; упрощать дизайн; усиливать сигналы; выполнять вычисления.

8. Составьте пары близких по значению слов из перечня, представленного ниже.

Verbs: to name, to complete, to calculate, to develop, to keep, to interpret, to communicate, to fulfill, to apply, to translate, to improve, to build, to call, to store, to communicate, to figure out, to perform, to use, to finish, to construct, to connect.

Nouns: speed, aim, storage, information, machine, significance, computation, data, device, rate, calculation, purpose, memory, importance.

9. Заполните пропуски необходимыми словами.

1. The first digital computer could…… a lot of mathematical problems at a fast …….2. Vannevar Bush built the firsts…… computer in 1930. 3. Babbage's analytical engine was designed to…….data. 4. J.von Neumann invented a machine that was able to…… not only data but also ……. 5. Neumann……….the idea of storing data in a ……. 6. Computers use two conditions for-………symbols. 7. Theinvention of……made computers possible to controland …….. electronic signals. 8. Due to …… computers could perform …….much faster.

10. Переведитепредложенияилисловосочетания, содержащие:

А. Инфинитиввфункцииобстоятельства

1. Computers were designed to perform thousands of computations per second. 2. To make computers more reliable transistors were used. 3. They were applied to reduce computational time. 4. To integrate large numbers of circuit elements into a small chip, transistors should be reduced in size. 5. To use integrated circuit technology new computers were built. 6. Analytical engine was invented to store data.

Б. Инфинитиввфункцииопределения

The problem to be solved; the work to be finished; the cards to be punched; calculations to be performed; the machine to be shown at the exhibition; the device to be provided with the necessary facts; computers to be used for data processing; efforts to increase reliability; electronics to connect systems and subsystems; the speed of response to depend on the size of transistor; computers to perform thousands of calculations per second; vacuum tubes to control and amplify electric signals; these are circuits to use a large number of transistors; operations to be performed.

11. Выполните письменно перевод текста по вариантам. Затем поменяйтесь вариантами, прочтите текст и выразите одним-двумя предложениями основную мысль других текстов.

Some First Computer Models

1. Babbage's Analytical Engine

In 1832, an English inventor and mathematician Charles Babbage was commissioned by the British government to develop a system for calculating the rise and fall of the tides.

Babbage designed a device and called it an analytical engine. It was the first programmable computer, complete with punched cards for data input. Babbage gave the engine the ability to perform different types of mathematical operations. The machine was not confined to simple addition, subtraction, multiplication, or division. It had its own "memory", due to which the machine could use different combinations and sequences of operations to suit the purposes of the operator.

The machine of his dream was never realized in his life. Yet Babbage's idea didn't die with him. Other scientists made attempts to build mechanical, general-purpose, stored-program computers throughout the next century. In 1941 a relay computer was built in Germany by Conrad Zuse. It was a major step toward the realization of Babbage's dream.

2. The Mark I Computer (1937-1944)

In 1944 in the United States, International Business Machines (IBM) built a machine in cooperation with scientists working at Harvard University under the direction of Prof. Aik-en. The machine, called Mark I Automatic Sequence-Controlled Calculator, was built to perform calculations for the Manhattan Project, which led to the development of atomic bomb. It was the largest electromechanical calculator ever built. It used over 3000 electrically actuated switches to control its operations. Although its operations were not controlled electronically, Aiken's machine is often classified as a computer because its instructions, which were entered by means of a punched paper tape, could be altered. The computer could create ballistic tables used by naval artillery.

The relay computer had its problems. Since relays are electromechanical devices, the switching contacts operate by means of electromagnets and springs. They are slow, very noisy and consume a lot of power.

3. The ABC (1939-1942)

The work on introducing electronics into the design of computers was going on.

The gadget that was the basis for the first computer revolution was the vacuum tube, an electronic device invented early in the twentieth century. The vacuum tube was ideal for use in computers. It had no mechanical moving parts. It switched flows of electrons off and on at rates far faster than possible with any mechanical device. It was relatively reliable, and operated hundreds of hours before failure. The first vacuum tube computer was built at Iowa University at about the same time as the Mark I. The computer, capable to perform thousands of related computations, was called ABC, the Atanasoff-Berry Computer, after Dr.John Atanasoff, a professor of physics and his assistant, Clifford Berry. It used 45 vacuum tubes for internal logic and capacitors for storage. From the ABC a number of vacuum-tube digital computers developed.

Soon the British developed a computer with vacuum tubes and used it to decode German messages.

12.Прочтите текст и передайте кратко его содержаниеа) на русском языке; б) на английском языке.

Four Generations of Computers

The first vacuum tubes computers are referred to *as first generation computers,* and the approximate period of their use was from 1950 to 1959. UNIVAC 1 (UNIVersal Automatic Computer) is an example of these computers which could perform thousands of calculations per second. Those devices were not only bulky, they were also unreliable. The thousands of vacuum tubes emitted large amounts of heat and burned out frequently.

The transistor, a smaller and more reliable successor to the vacuum tube, was invented in 1948. So-called *second generation computers,* which used large numbers of transistors were able to reduce computational time from milliseconds to microseconds, or millionths of seconds.

Second-generation computers were smaller, faster and more reliable than first-generation computers.

Advances in electronics technology continued, and microelectronics made it possible to reduce the size of transistors and integrate large numbers of circuit elements into very small chips of silicon. The computers that were designed to use integrated circuit technology were called *third generation computers,* and the approximate time span of these machines was from 1960 to 1979. They could perform many data processing operations in nanoseconds, which are billionths of seconds.

Fourth generation computers have now arrived, and the integrated circuits that are being developed have been greatly reduced in size. This is due to microminiaturization, which means that the circuits are much smaller than before; as many as 100 tiny circuits are placed now on a single chip. A chip is a square or rectangular piece of silicon, usually from 1/10 to 1/4 inch, upon which several layers of an integrated circuit are etched or imprinted, after which the circuit is encapsulated in plastic or metal.

13. Подберите вместо пропусков подходящее **по смыслу слово.**

1. British scientists invented a____way of multiplying anddividing.
   a) mechanical; b) electrical; c) optical
2. A new branch of mathematics,____, was invented inEngland and Germany independently.
   a) mechanics; b) arithmetics; c) calculus
3. A young American clerk invented a means of coding _____by punched cards.
   a) letters; b) data; c) numbers
4. Soon punched cards were replaced by____terminals.
   a) printer; b) scanner; c) keyboard
5. Mark I was the first____computer that could solve mathematical problems.
   a) analog; 1?) digital; c) mechanical
6. J. von Neumann simplified his computer by storing in formation in a_____code.
   a) analytical; b) numerical; c) binary
7. Vacuum tubes could control and____electric signals.
   a) calculate; b) amplify; c) generate
8. The first generation computers were____and often burned out.
   a) uncomfortable; b) uncommunicative; c) unreliable
9. Computers of the second generation used____which reduced computational time greatly.
   a) transistors; b) integrated circuits; c) vacuum tubes
10. Due to____the development of the fourth generation computers became possible.
    a) microelectronics; b) miniaturization; c) microminiaturization

14. Выберите правильный перевод предложений, содержащих **неличные формы глагола (Infinitive, Gerund, ParticipleI, ParticipleII).**

1. That was the machine provided with the necessary factsabout the problem to be solved.
   а) Машину обеспечили необходимыми фактами, чтобы она решила проблему.
   б) То была машина, снабженная необходимой информацией о задаче, которую предстояло решить.
   в) Эту машину обеспечили необходимой информацией о решаемой задаче.
2. The computers designed to use 1C were called third generation computers.

а) Компьютеры сконструировали для использованияИС и назвали их третьим поколением.

б) Компьютеры назывались третьим поколением, потому что в них использовались ИС.

в) Компьютеры, сконструированные, чтобы использовать ИС, назывались компьютерами третьего поколения.

3. Mark I was the first machine to figure out mathematicalproblems.

а) Первая машина для вычисления математических проблем была Марк I.

б) Марк I явилась первой машиной для вычисления математических задач.

в) Марк I была первой машиной, которая вычисляла математические задачи.

4. Early computers using vacuum tubes could perform computations in milliseconds.

а) Первые компьютеры, использующие электронные лампы, могли выполнять вычисления в течение миллисекунд.

б) Ранние компьютеры использовали вакуумные лампы, которые выполняли вычисления за миллисекунды.

в) Рано компьютеры, использующие электронныетрубки, выполняли вычисления за миллисекунды.

5. Vacuum tubes to control and amplify electric signals wereinvented by Neumann.

а) Изобретенные Нойманом вакуумные лампы регулировали и усиливали электрические сигналы.

б) Нойман изобрел электронные лампы для управления и усиления электрических сигналов.

в) Электронные лампы, которые регулировали и усиливали электрические сигналы, были изобретены Нойманом.

6. Neumann's machine called the EDVAC was designed tostore both data and instructions.

а) Ноймановскую машину, называемую EDVAC, сконструировали для хранения информации и команд.

б) Машина Ноймана, названная EDVAC, была создана, чтобы запоминать как информацию, так и команды.

в) Машину Ноймана, которая хранила данные и инструкции, назвали EDVAC.

7. Computers were developed to perform calculations formilitary and scientific purposes.

а) Компьютеры были созданы, чтобы выполнять вычисления для военных и научных целей.

б) Компьютеры создали для выполнения военных инаучных вычислений.

в) Созданные компьютеры выполняли вычислениявоенного и научного назначения.

8. An American clerk invented a means of coding the databy punching holes into cards.

а) Американский служащий изобрел посредством кодирования информации перфокарту.

б) Американский клерк изобрел перфокарту, кодируя информацию.

в) Американский служащий изобрел средство шифрования информации путем пробивания отверстий в карте.

Раздел 2.TheFunctionalOrganizationofaComputer / Функциональное устройство компьютера

Практическое занятие № 5.
Тема занятия: DataProcessingConcepts/ Концепции обработки данных

Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.

В результате освоения темы студент должен:

знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;

уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;

владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.

Актуальность темы: обусловлена необходимостью овладения компетенцией УК-4.

Теоретическаячасть:
Data Processing and Data Processing Systems

The necessary data are processed by a computer to become useful information. In fact this is the definition of data processing. *Data* are a collection of facts — unorganized but able to be organized into useful information. **Processing** is **a** series of actions or operations that convert inputs into outputs. When wespeak of data processing, the input is data, and the output is useful information. So, we can define **data processing** as a series of actions or operations that converts data into useful information.

We use the term **data processing system** to include the resources that are used to accomplish the processing of data. There are four types of resources: people, materials, facilities, and equipment. People provide input to computers, operate them, and use their output. Materials, such as boxes of paper and printer ribbons, are consumed in great quantity. Facilities are required to house the computer equipment, people and materials.

The need for converting facts into useful information is not a phenomenon of modern life. Throughout history, and even prehistory, people have found it necessary to sort data into forms that were easier to understand. For example, the ancient Egyptians recorded the ebb and flow of the Nile River and used this information to predict yearly crop yields.Today computers convert data about land and water into recommendations to farmers on crop planting. Mechanical aids to computation were developed and improved upon in Europe, Asia, and America throughout the seventeenth, eighteenth, and nineteenth centuries. Modern computers are marvels of an electronics technology that continues to produce smaller, cheaper, and more powerful components.

Basic data processing operations

Five basic operations are characteristic of all data processing systems: inputting, storing, processing, outputting, and controlling. They are defined as follows.

Inputting is the process of entering data, which are collected facts, into a data processing system. *Storing* is saving data or information so that they are available for initial or for additional processing. *Processing* represents performing arithmetic or logical operations on data in order to convert them into useful information. *Outputting* is the process of producing useful information, such as a printed report or visual display.

Controlling is directing the manner and sequence in which all of the above operations are performed.

Data storage hierarchy

It is known that data, once entered, are organized and stored in successively more comprehensive groupings. Generally, these groupings are called a data storage hierarchy. The general groupings of any data storage hierarchy are as follows.

1) *Characters*, which are all written language symbols: letters, numbers, and special symbols. 2) *Data elements*, which are meaningful collections of related characters. Data elements are also called data items or fields. 3) *Records*, which are collections of related data elements. 4) *Files*, which are collections of related records. A set of related files is called a data base or a data bank.

Vocabulary

dataprocessing ['deitəprou'sesiŋ] — обработка информации (данных)

toconvert [kən'və:t] — преобразовывать; переводить (в др. единицы)

toaccomplish [a'kɔmpliʃ] —завершать, заканчивать; осуществлять, выполнять.

tohouse ['haus] — помещать, размещать

toimprove [im'pru:v] — улучшать, совершенствовать

tocontrol [kən'troul] — управлять, регулировать; управление, регулирование

tostore ['stɔ:] — хранить, запоминать, заносить (размещать) в памяти

storage ['stɔ:ndʒ] — запоминающее устройство, память; хранение

resource [ri'sɔ:s] — ресурс; средство; возможность

facility [fə'siliti] —- устройство; средство

facilities — приспособления; возможности

equipment [i'kwipmənt] — оборудование; аппаратура; приборы; устройства

available [ə'veiəbl] — доступный; имеющийся (в наличии); возможный

display [dis'plei] — дисплей; устройство (визуального) отображения; показ

manner ['mænə] — способ, образ (действий)

sequence ['sikwəns] — последовательность, порядок (следования)

sucessively [sək'sesivli] — последовательно

datastoragehierarchy [haiə'ra:ki] — иерархия (последовательность) запоминания информации (данных)

toenter ['entə] — входить; вводить (данные); заносить, записывать

comprehensivegroupings — полные, обширные, универсальные образования

meaningful ['mi:niŋful] — имеющий смысл; значащий (о данных)

item ['aitəm] — элемент; составная часть

record ['rekɔ:d] — запись, регистрация; записывать, регистрировать

file ['fail] — файл; заносить (хранить) в файл

set — набор; множество; совокупность; серия; группа; система

data base ['deitə 'beis] — базаданных

related [ri'leitid] — смежный; взаимосвязанный; относящийся (к ч.-л.)

Вопросы и задания:

1. Просмотрите текст **еще раз. Ответьте на вопросы, используя информацию текста.**

1. What is processing? 2. What is data processing? 3. What does the term of data processing system mean? 4. What basic operations does a data processing system include? 5. What is inputting / storing / outputting information? 6. What do you understand by resources? 7. How did ancient Egyptians convert facts into useful information? 8. When were mechanical aids for computation developed? 9. What does data storage hierarchy mean? 10. What are the general groupings of any data storage hierarchy?

2. Найдите в тексте английские эквиваленты следующих **словосочетаний:**

Системы обработки информации; определение (термина) обработки данных; совокупность фактов; последовательность действий; преобразование входных данных в полезную информацию; включать ресурсы; завершить обработку данных; обеспечивать ввод информации в компьютер; ленты принтера; расходовать в большом количестве; размещать компьютерное оборудование; нуждаться (требовать) в приспособлениях; явление современной жизни; на протяжении доисторического периода; превращать информацию в выражения; регистрировать отливы и приливы; прогнозировать урожай зерновых культур; механические средства вычисления; ввод данных; хранение данных; первоначальная обработка данных; дополнительная обработка; выдача полезной информации; напечатанное сообщение; зрительное отображение; последовательность запоминания информации; записанные символы языка; элементы информации; база данных; набор взаимосвязанных файлов.

3. Переведитеследующиецепочкисуществительных:

Data resource; storage resource; network resource; security resource; system resource.

Communication facilities; data base facilities; display facilities; management facilities.

Distance control; device control; keyboard control; position control; program control.

Computer storage; laser storage; file storage; disk storage; data storage hierarchy.

Character sequence; instruction sequence; message sequence; pulse sequence.

Batch file; catalog file; data file; help file; input file; output file; menu file; user file.

Command input; data input; disk input; file input; keyboard input; program input.

4. Подберите к терминам, данным в левой колонке, определения, представленные справа:

1. Computer   a) the set of instructions that directthe operations of computers;

2. Computer literacy   b) a part of a computer, enteringdata into the device;

3. A program   c) facts unorganized but able to beorganized;

4. Data   d) the output of a data processingsystem;

5. Data processing   e) possessing sufficient knowledge

of how computers work and what they can do to use them as problem-solving tools;

6. Data processing   f) a series of operations that results

in the conversion of data system into useful information;

6.   Input   g) an electronic device performingcalculations on numerical data;

8. Output   h) an electronic device acceptingthe data processing results from the computer and displaying them;

9. Useful information   i) a set of related files;

10. Data bank   j) the resources required to accomplish the processing of data. These resources are personnel, material, facilities and equipment.

5. Проанализируйтенеличныеформыглаголаиправильнопереведитепредложения.

1. Data are processed to become useful information. 2. We use the term data processing to include the resources applied for processing of information. 3. Resources required for accomplishing the processing of data are called data processing system. 4. Processing is a series of operations converting inputs into outputs. 5. Facilities are required to house the computer equipment. 6. Egyptians used the information to predict crop yields. 7. Information to be put into the computer for processing shouldbe coded into ones and zeroes. 8. Processing is operations on datato convert them into useful information. 9. The first machines designed to manipulate punched card data were widely used forbusiness data processing. 10. Hollerith built one machine to punch the holes and the other to tabulate the collected data.

6. Прочтите текст и скажите, каковы основные достоинства компьютеров. Переведите текст.

Advantages of Computer Data Processing

Computer-oriented data processing systems or just computer data processing systems are not designed to imitate manual systems. They should combine the capabilities of both humans and computers. Computer data processing systems can be designed to take advantage of four capabilities of. computers.

1.*Accuracy*. Once data have been entered correctly into the computer component of a data processing system, the need for further manipulation by humans is eliminated, and the possibility of error is reduced. Computers, when properly programmed, are also unlikely to make computational errors. Of course, computer systems remain vulnerable to the entry by humans of invalid data.

2.*Ease of communications*. Data, once entered, can be transmitted wherever needed by communications networks. These may be either earth or satellite-based systems. A travel reservations system is an example of a data communications network. Reservation clerks throughout the world may make an enquiry about transportation or lodgings and receive an almost instant response. Another example is an office communications system that provides executives with access to a reservoir of date, called a corporate data base, from their personal microcomputer work stations.
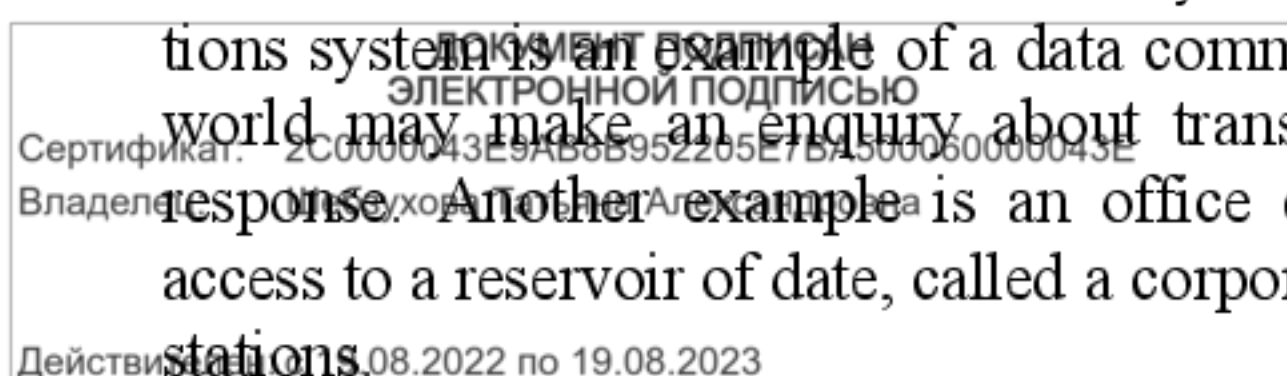
3. *Capacity of storage*. Computers are able to store vast amounts of information, to organize it, and to retrieve it in ways that are far beyond the capabilities of humans. The amount of data that can be stored on devices such as magnetic discs is constantly increasing. All the while, the cost per character of data stored is decreasing.

4. *Speed*. The speed, at which computer data processing systems can respond, adds to their value. For example, the travel reservations system mentioned above would not be useful if clients had to wait more than a few seconds for a response. The response required might be a fraction of a second.

Thus, an important objective in the design of computer data processing systems is to allow computers to do what they do best and to free humans from routine, error-prone tasks. The most cost-effective computer data processing system is the one that does the job effectively and at the least cost. By using computers in a cost-effective manner, we will be better able to respond to the challenges and opportunities of our post-industrial, information-dependent society.

Vocabulary

manual ['mænjuəl] — ручной, выполняемыйвручную

to take advantage of smth — воспользоватьсяч.-л.

capability ['keipə'bilti] — способность; возможность; характеристика

accuracy ['ækjurəsi] — точность; правильность; четкость (изображения)

correctly [kə'rektli] — правильно; верно

to eliminate [e'limineit] — устранять; удалять; отменять; ликвидировать

to make errors ['erəz] — допускать ошибки (погрешности)

error-prone — подверженный ошибкам

to remain vulnerable [ri'mein 'vʌlnərəbl] — оставаться уязвимым, чувствительным

invalid data [in'vəlid] — неверные, неправильные, недопустимые данные

communications networks — сети передачи данных; сети связи

travel ['trævəl] — перемещение; прохождение; путь; ход

instant response ['instəntri'spɔns] — мгновенныйответ (реакция)

to respond [ri'spɔnd] — отвечать; реагировать

access ['æksəs] —доступ; обращение; обращаться, иметь доступ

capacity of storage [kə'pæsitiev 'stɔndʒ] — объем (емкость) памяти

to retrieve [ri'tri:v] — извлекать, выбирать (данные); восстанавливать (файл)

value ['vælju] — значение; величина; значимость; ценность; оценка; оценивать

objective [əb'dʒektiv] — цель; требование; целевая функция

cost-effective ['kɔsti'fektiv] — экономичный; экономически оправданный

challenge ['tʃælindʒ] — трудность; препятствие; представлять трудность
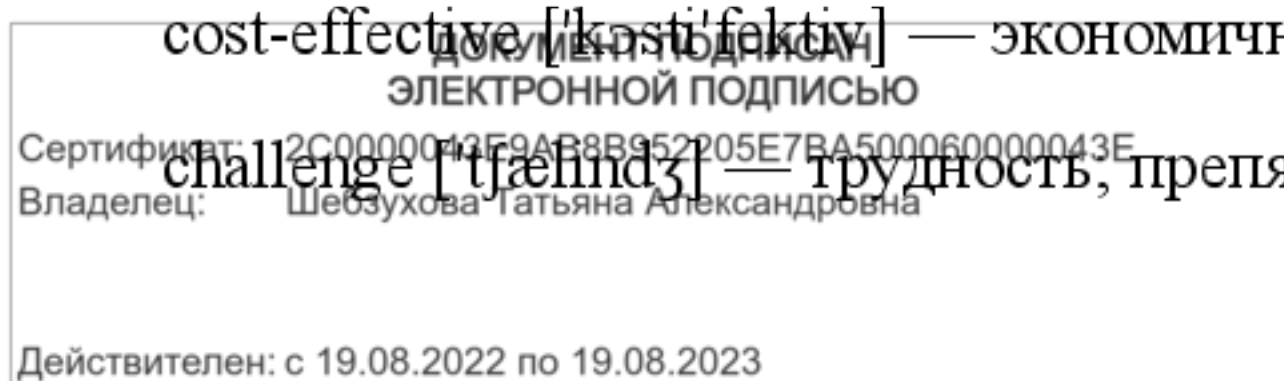
7. Ответьте на вопросы, используя информацию текста.

1. What capabilities should data-processing systems combine when designed? 2. What are the main advantages of computers? 3. What do you know of computers accuracy? 4. What is the function of communication networks? 5. Give examples of a data communication network. 6. What do you understand by capacity storage? 7. What other values of computer data processing systems do you know? 8. What is an important objective in the design of computer data processing systems? 9. What is the most effective computer data processing system? 10. What is the best way of responding to the challenges and opportunities of our post-industrial society?

8. Найдите в тексте английские эквиваленты следующих словосочетаний:

Система обработки информации компьютером; система ориентирования на обработку данных компьютером; сочетать возможности человека и машины; ограничивать управление; вряд ли допустят ошибку; оставаться уязвимым; недопустимые данные; легкость осуществления связи; сеть передачи информации; системы, основанные на использовании спутников; служащие по резервированию жилья; получить мгновенный ответ; наводить справки; хранилище данных; корпоративная база данных; объем памяти; запоминать огромное количество информации; извлекать информацию; добавить значимости; упомянутый выше; доля секунды; подверженный ошибкам; экономически оправданный,

9. Вспомните значение новых слов и догадайтесь о значении их производных.

To eliminate: elimination; eliminable; eliminator; unlimited.

To respond: respondent; response; responsible; irresponsible; responsibility.

Accuracy: inaccuracy; accurate; inaccurate; accurately.

Correctly: correct; incorrect; to correct; correction; correctional; corrective; corrector.

Vulnerable: invulnerable; vulnerability; invulnerability.

Invalid: valid; invalidity; validity;

Access: accessible; inaccessible; accessibility; inaccessibility.

10. Преобразуйте предложения, содержащие модальные глаголы, в а) прошедшее время; б) будущее время.

1. Computers *can* replace people in dull routine work. 2. The program is a set of instructions that *may* also include data to be processed. 3. Computer-controled robots *must* increase the productivity of industry. 4. *They can* help in making different decisions. 5. The pupils *may* work with computers at the lessons. 6. Electric pulses *can* move at the speed of light. 7. Storage devices *must* have capacities for the input, output data and programs and for intermediate results. 8. Business minicomputers *can* perform to 100 million operations per second. 9. In order to solve scientific problems researchers *must* deal with the language of science — mathematics. 10. Programmers *must* write application programs in a way that computers *can* understand.

11. Подберите вместо пропусков подходящее по смыслу слово.

1. Computer data .... system frees humans from routine error-prone tasks.

a) counting; b) computing; c) processing

2. Computers can store vast amount of information to organize it and .... it.
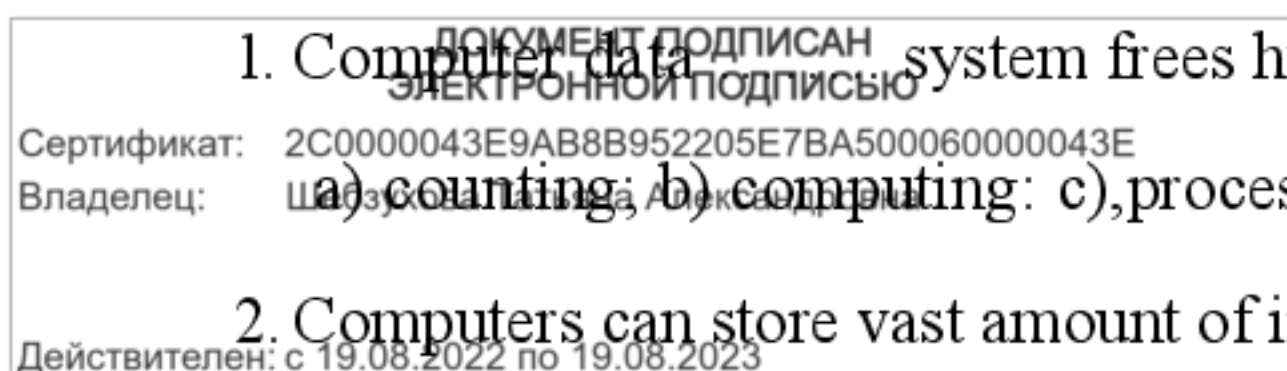
a) to travel; b) to retrieve; c) to respond

3. The entered data can be transmitted by____networks.

a) communications; b) conversions; c) procession

4. The possibility of ……is reduced if data were correctly put into the data processing system,
a)   character; b) access; c) error

5. Computer data processing systems can ……   at a fraction of a second.

a) receive; b) respond; c) retrieve

6. Computer systems are vulnerable to the entry of___……data.
a) invalid; b) invariable; c) invisible

7. As soon as data were entered into the system correctly, the human ……   is limited.

a) computation; b) information; manipulation

8. The amount of data stored on magnetic discs is constantly …………

a) decreasing; b) increasing; c) eliminating

12. Согласуйте слова в левой колонке с их интерпретацией, предложенной справа.

1. Inputting   a) saving information for further processing;

2. Character   b) the process of producing useful information;

3. Database   c) meaningful collections of related characters;

4. Data elements   d) the most common input device;
5.Controlling   e) the part of the computer that receives and stores data for processing;
6. Outputting   f) directing the sequence of the operations performed;

7. Memory   g) *a* written language symbol;
8. Record   h) a collection of related data elements
9. Keyboard   i) a set of related facts;
10. Storing   j) the process of entering collected into a data processing system;

Практическое занятие № 6.
**Тема занятия: ComputerSystemArchitecture / Структура
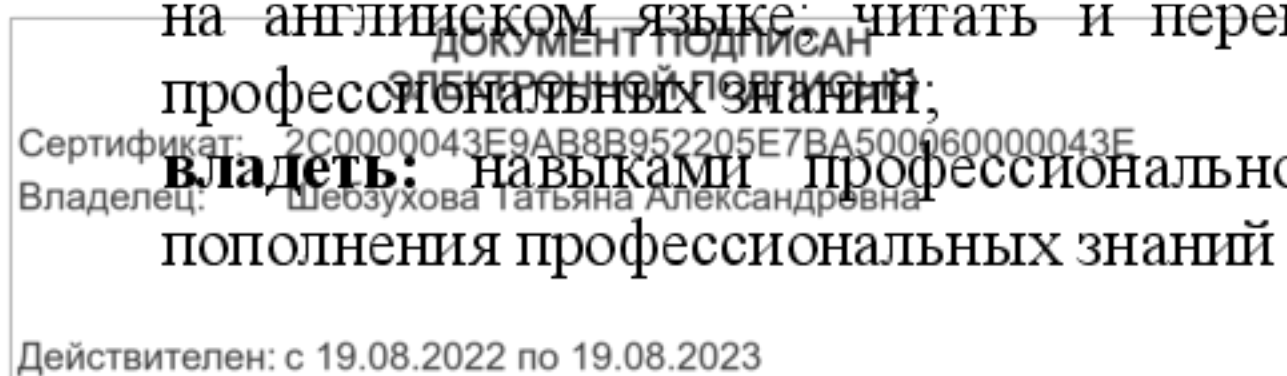компьютерной системы**

Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.
В результате освоения темы студент должен:
знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;
уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;
владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.

Актуальность темы: обусловлена необходимостью овладения компетенцией УК-4.

<center>**Теоретическаячасть:**</center>

<center># Computer System Architecture</center>

As we know all computer systems perform the functions of inputting, storing, processing, controlling, and outputting. Now we'll get acquainted with the computer system units that perform these functions. But to begin with let's examine computer systems from the perspective of the system designer, or architect.

It should be noted that computers and their accessory equipment are designed by a *computer system architect,* who usually has a strong engineering background. As contrasted with the *analyst,* who uses a computer to solve specific problems, the computer system architect usually designs computer that can be used for many different applications in many different business. For example, the product lines of major computer manufacturers such as IBM, Digital Equipment Corporation and many others are the result of the efforts of teams of computer system architects.

Unless you are studying engineering, you don't need to become a computer system architect. However, it is important that as a potential user, applications programmer or systems analyst you understand the functions of the major units of a computer system and how they work together.

Types of computers

The two basic types of computers are analog and digital. *Analog computers* simulate physical systems. They operate on the basis of an analogy to the process that is being studied. For example, a voltage may be used to represent other physical quantities such as speed, temperature, or pressure. The response of an analog computer is based upon the measurement of signals that vary continuously with time. Hence, analog computers are used in applications that require continuous measurement and control.

Digital computers, as contrasted with analog computers, deal with discrete rather than continuous quantities. They count rather than measure. They use numbers instead of analogous physical quantities to simulate on-going, or real-time processes. Because they are discrete events, commercial transactions are in a natural form for digital computation. This is one reason that digital computers are so widely used in business data processing.

Machines that combine both analog and digital capabilities are called *hybrid computers.* Many business, scientific, and industrial computer applications rely on the combination of analog and digital devices. The use of combination analog devices will continue to increase with the growth in applications of microprocessors and microcomputers. An example of this growth is the trend toward installing control systems in household appliances such as microwave ovens and sewing machines. In the future we will have complete indoor climate control systems and robots to do our housecleaning. Analog sensors will provide inputs to the control centres of these systems, which will be small digital computers.

Vocabulary

architecture ['a:ki'tektʃə]— архитектура; структура

architect ['a:kitekt] — разработчикархитектуры (системы, структуры)

unit ['ju:nit] — устройство; модуль; блок; элемент; составная часть
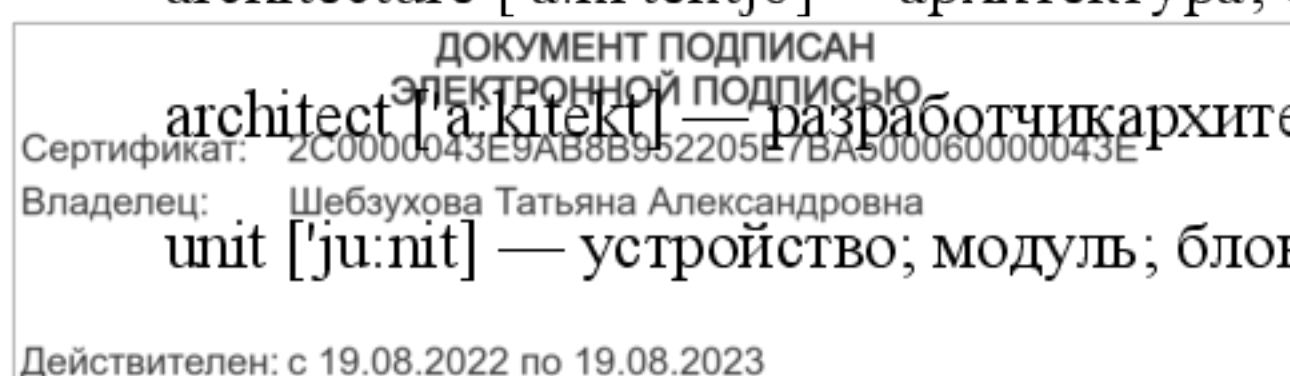
accessoryequipment [æk'sesəri] — вспомогательные устройства

engineeringbackground ['bækgraund] — техническая подготовка, квалификация

analyst ['ænəlist] — аналитик; системный разработчик

productline — серия (компьютерных) продуктов

manufacturer ['mænju'fæktʃərə] — изготовитель; производитель; разработчик

applicationprogrammer [æpli'keiʃnprou'græmə] — прикладной программист

tosimulate ['simjuleit] — моделировать; имитировать

voltage ['vɔltidʒ] — напряжение

pressure ['preʃə] — давление, сжатие

digitalcomputer ['didʒitəlkəm'pju:tə] — цифровой компьютер

hybridcomputer ['haibrid] — смешанного типа, аналого-цифровой компьютер

discrete [dis'kri:t] — дискретный; отдельный

continuousquantity [kən'tinjuəs 'kwɔntiti] — непрерывная величина

on-goingprocess — продолжающийся, постоянный, непрерывный процесс

torely [ri'lai] — основываться на ч.-л.; полагаться

toinstall [in'stɔ:l] — устанавливать; размещать; монтировать; настраивать

householdappliances ['haushould əp'laiənsiz] — домашние приборы / устройства

microwaveoven ['maikrouweiv 'ʌvn] — микроволновая печь

indoorclimatecontrolsystem — система регуляции температуры в доме

Вопросы и задания:

1. Просмотрите текст еще раз. Ответьте на вопросы, используя информацию текста.

1. Who designs computers and their accessory equipment? 2. What is the role of an analyst? 3. Is it necessary for a user to become a computer system architect? 4. What functions do computer systems perform? 5. What types of computers do you know? 6. What is the principle of operation of analog computers? 7. How do digital computers differ from analog computers? 8. Where are digital and analog computers used? 9. What are hybrid computers? 10. Wheredotheyfindapplication?

2. Найдите в тексте английские эквиваленты следующихсловосочетаний:

Функции ввода, хранения, обработки, управления **и** вывода информации; познакомиться; системные блоки; для начала; вспомогательные устройства; разработчик компьютерной системы; хорошая компьютерная подготовка; различные сферы применения; конфигурация цифрового оборудования; прикладной программист; системный разработчик; главные устройства компьютерной системы; моделировать физические величины; измерение сигналов; в отличие от; иметь дело скорее с дискретными, чем непрерывными величинами; в режиме реального времени;
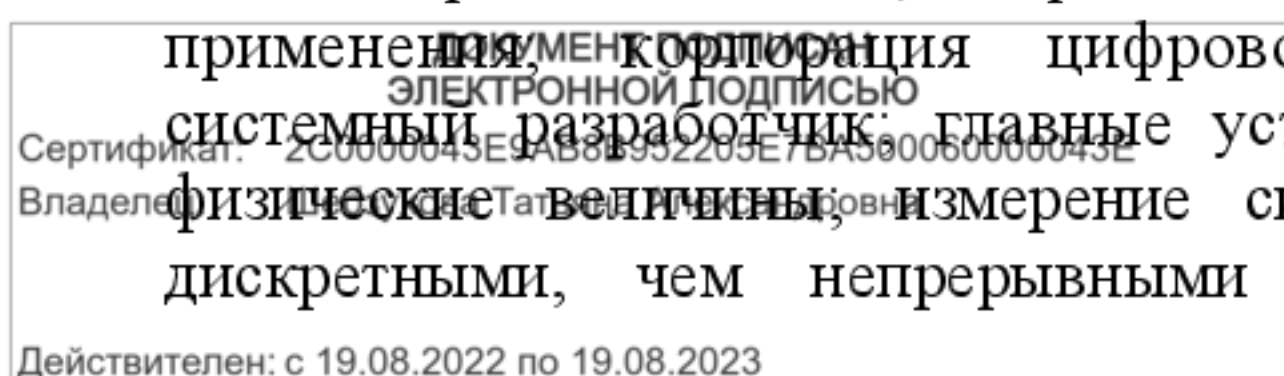
коммерческие операции; цифровое вычисление; аналого-цифровые компьютеры; тенденция к установке систем управления; домашние приборы.

3. Образуйте (и переведите) имена существительные отприведенных ниже глаголов с помощью суффиксов:

A. -er, -or

To control, to compute, to design, to use, to manufacture, to work, to simulate, to operate, to protect, to process, to deal, to perform, to examine, to program, to execute, to transmit, to convert, to print, to consume, to record.

B. -tion, -sion

To organize, to collect, to combine, to apply (ic), to represent, to add, to corporate, to transact, to compute, to produce, to operate, to execute, to protect, to substitute, to prepare, to invent, to decide, to eliminate, to communicate, to correct, to inform.

C.-ment

To require, to measure, to equip, to invest, to accomplish, to improve, to develop, to achieve, to displace, to govern, to move.

4. Переведите предложения, содержащие ParticipleI иParticipleII, в функции обстоятельства.

1. When entering the Internet, I always find a lot of interesting information. 2. Though never built Babbage's analytical engine was the basis for designing today's computers. 3. When written in a symbolic language programs require the translation into the machine language. 4. While operating on the basis of analogy analog computers simulate physical systems. 5. When used voltage represents other physical quantities in analog computers. 6. Being discrete events commercial transactions are in a natural form for a digital computer. 7. As contrasted with the analyst, the computer system architect designs computers for many different applications. 8. While dealing with discrete quantities digital computers count rather than measure. 9. When using a microcomputer you are constantly making choice — to open a file, to close a file, and so on. 10. As known all computer systems perform the functions of inputting, storing, processing, controlling, and outputting.

5. Прочтите текст и объясните, как вы понимаете термины «аппаратное обеспечение» и «программное обеспечение». Переведитетекст.

Hardware, Software, and Firmware

The units that are visible in any computer are the physical components of a data processing system, or *hardware*. Thus, the input, storage, processing and control devices are hardware. Not visible is the *software* — the set of computer programs, procedures, and associated documentation that make possible the effective operation of the computer system. Software programs are of two types: systems software and applications software.

Systems software are the programs designed to control the operation of a computer system. They do not solve specific problems. They are written to assist people in the use of the computer system by performing tasks, such as controlling all of the operations required, to move data into and out of a computer and all of the steps in executing an application program. The person who prepares systems software is referred to as a systems programmer. Systems programmers are highly trained specialists and important members of the architectural team.

Applications software are the programs written to solve specific problems (applications), such as payroll, inventory control, and investment analysis. The word program usually refers to an application program, and the word programmer is usually a person who prepares applications software.

Often programs, particularly systems software, are stored in an area of memory not used for applications software. These protected programs are stored in an area of memory called readonly memory (ROM), which can be read from but not written on.

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

Vocabulary

hardware ['ha:dwɛə] — аппаратное обеспечение; аппаратура; оборудование

software ['sɔftwɛə] — программное обеспечение; программные средства

system software — системное программное обеспечение

application software— прикладное программное обеспечение

firmware ['fə:mwɛə] — встроенное /микропроцессорное программное обеспечение

visibleunits ['vizibl 'juːnits] — видимый блок, устройство

procedure [prə'siːdʒə] — процедура, процесс; метод, методика; алгоритм

to associate [ə'souʃieit] — соединять; объединять; связывать

associated documentation — соответствующая документация

to execute applications programs — выполнять прикладные программы

payroll ['peiroul] — платежная ведомость

inventorycontrol [in'ventərikən'troul] — инвентаризация; переучет

investmentanalyses [ə'nælisiz] — анализ инвестиций (капиталовложений)

toprotect [prə'tekt] — защищать

read-onlymemory (ROM) — постоянноезапоминающееустройство (ПЗУ)

toreferto [ri'fə:] — относиться к; ссылаться на

to substitute ['sʌbstitjuːt] — заменять; замещать

tocause ['kɔːz] — заставлять, вынуждать; причина, основание

toaccomplish [ə'kɔmpliʃ] — завершать, заканчивать; выполнять, осуществлять

performance[pə'fɔːməns] — производительность; быстродействие; рабочая характеристика

6. Ответьте на вопросы, используя информацию текста.

1. What is hardware? *2.* Give the definition of software. 3. What are the types of software? 4. What are systems software? 5. What kind of tasks do systems software perform? 6. Who prepares systems software? 7. What are applications software? 8. What problems do applications software solve? 9. What is firmware? 10. How can a computer system architect use firmware?

7. Найдите в тексте английские эквиваленты следующихсловосочетаний:

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

8. Вспомните значение новых слов и попытайтесь перевести словосочетания, употребляемые с этими словами.

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

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

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

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

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

9. Озаглавьте каждый компонент текста и составьте небольшой реферат к нему (по вариантам).

Steps in The Developing of Computers

1. In 1948 due to the invention of transistors there appeared the possibility to replace vacuum tubes. The transistor occupied an important place on the way to computer development. The potential advantage of the transistor over the vacuum tube was almost as great as that of the vacuum tube over the relay. A transistor can switch flows of electricity as fast as the vacuum tubes used in computers, but the transistors use much less power than equivalent vacuum tubes, and are considerably smaller. Transistors are less expensive and more reliable. They were mechanically rugged, had practically unlimited life and could do some jobs better than electronic tubes. Transistors were made of crystallic solid material called semiconductor.

With the transistor came the possibility of building computers with much greater complexity and speed.
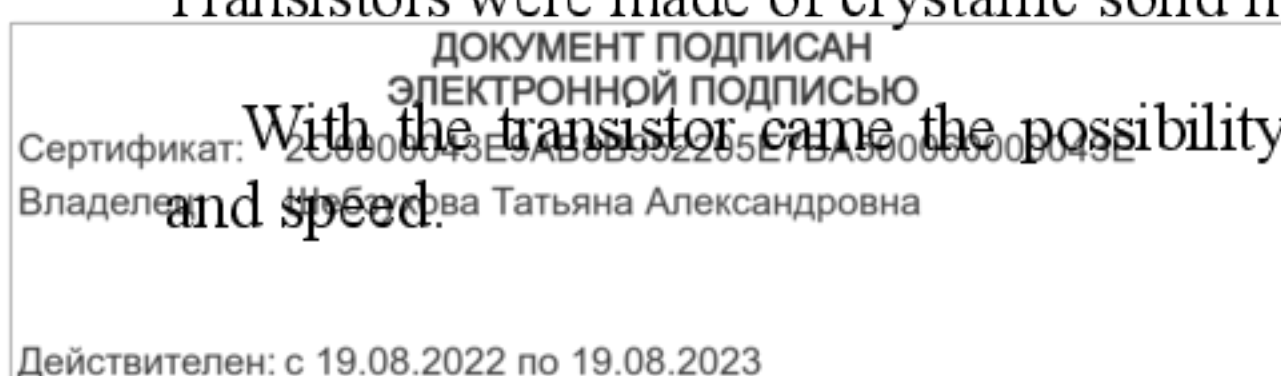
2. The integrated circuit constituted another major step in the development of computer technology. Until 1959 the fundamental logical components of digital computers were the individual electrical switches, first in the form of relays, then vacuum tubes, then transistors. In the vacuum tubes and relay stages, additional discrete components, such as resistors, inductors, and capacitors were required in order to make the whole system work. These components were generally each about the same size as packaged transistors. Integrated circuit technology permitted the elimination of some of these components and integration of most of the others on the same chip of semiconductor that contains the transistor. Thus the basic logic element — the switch, or "flip-flop', which required two separate transistors and some resistors and capacitors in the early 1950s, could be packaged into a single small unit in 1960. The chip was an important achievement in the accelerating step of computer technology.

3. In 1974 a company in New Mexico, called Micro Instrumentation Telemetry System (MITS) developed the Altair 8800, a personal computer (PC) in a kit. The Altair had no keyboard, but a panel of switches with which to enter the information. Its capacity was less than one per cent that of the 1991 Hewlett-Packard handheld computer. But the Altair led to a revolution in computer electronics that continues today. Hardware manufacturers soon introduced personal computers, and software manufacturers began developing software to allow the computers to process words, manipulate data, and draw. During the 1980s computers became progressively smaller, better and cheaper.

Today the personal computer can serve as a work station for the individual. A wide array of computer functions are now accessible to people with no technical background.

10. Поменяйтесь вариантами и выполните письменный перевод упр. 9.

11. Раскройте скобки, употребляя:

Л. Правильную неличную форму глагола

1. Computing is a concept (embraced;embracing; for embracing) not only arithmetics, but also computer literacy. 2. We can make the computer do what we want (inputted; to input; by inputting) signals (turning; turned; without turning) switches on and off. 3. Computers have a means (by communicating; of communicating; communicated) with the user. 4. Computers work according to the instructions (giving; given; to give) to it by users. 5. The transistor (inventing; invented; for inventing) in 1948 completely changed the vacuum tubes.

Б. Глагол в действительном или страдательном залоге

1. Computers (applied; are applied; are applying) for automatic piloting and automatic navigation. 2. The programs (write; have written; are written) to help people in the use of the computer system. 3. As digital computers (count; counted; are counted) quickly, they widely (use; used; are used) in business data processing. 4. Once data (entered; have entered; have been entered) correctly into the data processing system, the possibility of error (reduced; is reduced; are reduced). 5. It is known that an analyst (use; uses; is used) a computer to solve specific problems.

Практическое занятие № 7.
Тема занятия: FunctionalUnitsofDigitalComputers/
Функциональные блоки компьютера

Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.

В результате освоения темы студент должен:

знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;

уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;

владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.

Актуальность темы: обусловлена необходимостью овладения компетенцией УК-4.

Теоретическаячасть:

Functional Units of Digital Computers

As we know, all computer operations can be grouped into five functional categories. The method in which these five functional categories are related to one another represents the functional organization of a digital computer. By studying the functional organization, a broad view of the computer is received.

The five major functional units of a digital computer are:

1) Input— to insert outside information into the machine;
2) Storage or memory — to store information and make it available at the appropriate time;
3) Arithmetic-logical unit — toperform the calculations;
4) Output — to remove data from themachine to the outside world and
5) Control unit — to causeall parts of a computer to act as a team.

Figure 5 shows how the five functional units of the computer act together. A complete set of instructions and data are usually fed through the input equipment to the memory where they are stored. Each instruction is then fed to the control unit. The control unit interprets the instructions and issues commands to the other functional units to cause operations to be performed on the data. Arithmetic operations are performed in the arithmetic-logical unit, and the results are then fed back to the memory. Information may be fed from either the arithmetic unit or the memory through the output equipment to the outside world. The five units of the computer must communicate with each other. They can do this by means of a machine language which uses a code composed of combinations of electric pulses. These pulse combinations are usually represented by *zeros* and *ones,* where the *one* may be a pulse and the *zero* — a no-pulse. Numbers are communicated between one unit and another by means of these one-zero or pulse — no-pulse combinations. The input has the additional job of converting the information fed in by the operator into machine language. In other words, it tran-saltes from our language into the pulse — no-pulse combinations understandable to the computer. The output's additional job is converting the pulse — no-pulse combinations into a form understandable to us, such as a printed report.
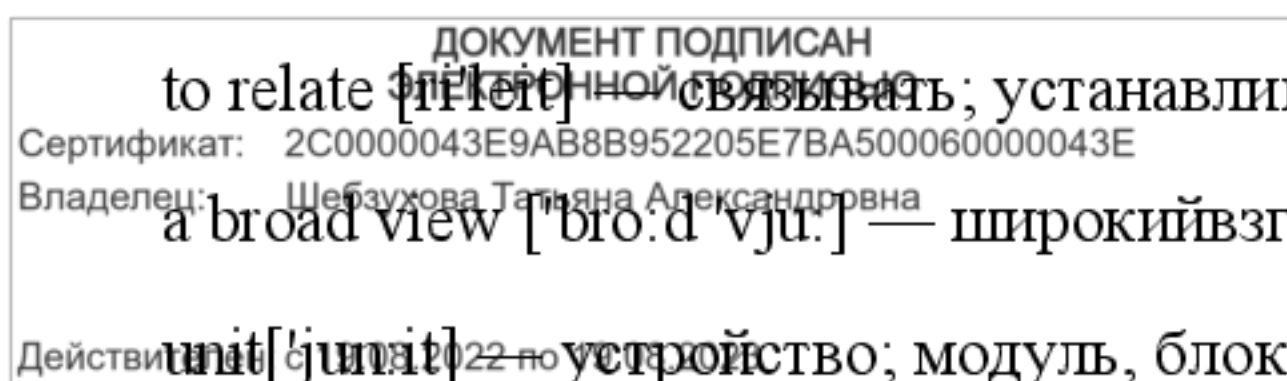
Vocabulary

operation [əpə'reiʃn] — операция; работа; действие; срабатывание

to relate [ri'leit] — связывать; устанавливать отношения

a broad view ['brɔ:d vju:] — широкийвзгляд, обзор

unit ['ju:nit] — устройство; модуль, блок; узел; элемент; ячейка

input — ввод; устройство ввода; вводить; подавать на вход

to insert [in'sə:t] — вставлять; вносить; включать

storage memory — память; запоминающее устройство

available [ə'veiləbl] — доступный; имеющийся в наличии

appropriate time — в нужное время

arithmetic-logicalunit— арифметико-логическое устройство

output — вывод; устройство вывода; выводить; подавать на выход

to remove [ri'mu:v] — удалять; устранять; вынимать; исключать

control unit — блок управления

cause ['kɔ:z]— заставлять; вынуждать; быть причиной; причина; основание

to feed (fed, fed) — подавать; питать; вводить (данные)

to interpret [in'təprit] — интерпретировать; истолковывать

to issue commands ['isju: kə'ma:ndz] — выдавать команды

pulse — no-pulse — (есть) импульс — холостой импульс

Вопросы и задания:

1. Просмотрите текст еще раз. Дайте ответы на вопросы, используя информацию текста.

1. What represents the functional organization of a computer? 2. What can we get by studying the functional organization? 3.What is the function of the input device? 4. What does memory serve for? 5. What is the task of the arithmetic-logical unit? 6. What is the function of the output? 7. What is the main purpose of the control unit? 8. How do all units of the computer communicate with each other? 9. What is the additional job of the input? 10. What is the additional function of the output?
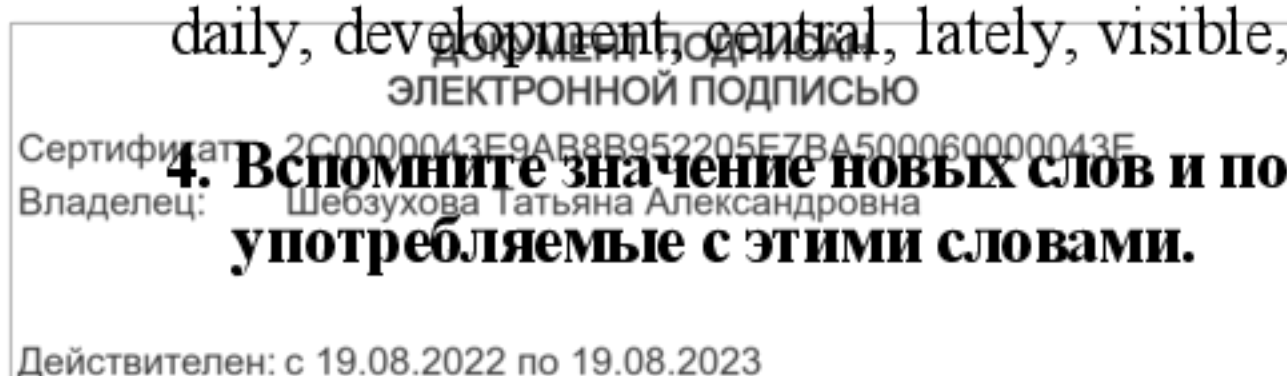
2. Найдите в тексте английские эквиваленты следующих словосочетаний:

Функциональная организация; действия компьютера; связывать друг с другом; вводить информацию извне; делать информацию доступной; выполнять вычисления; выводить информацию; блок управления; выдавать команды; заставлять выполнять команды; выходное устройство; внешний мир; связываться друг с другом; комбинация электрических импульсов; холостой импульс; импульсы, распознаваемые компьютером.

3. Разделите **приведенные ниже слова на три группы, определяя по суффиксу часть речи: существительное, прилагательное или наречие. Переведитеслова.**

Organization, functional, available, equipment, processor, completely, architectural, converter, convertible, controller, removable, logical, addition, additional, usually, accomplishment, operator, operation, mainly, communication, insertion, electronic, digital, instruction, generally, arithmetic, daily, development, central, lately, visible, substitution, understandable.

4. Вспомните значение новых слов и попытайтесь перевести словосочетания, употребляемые с этими словами.

Computer, analog computer; digital computer; hybrid computer; all-purpose computer; general-purpose computer; fifth-generation computer; game computer; handheld computer; mobile computer; multimedia computer; notebook computer; pocket computer; portable computer.

Unit: unit of memory; unit of data; unit of measurement; arithmetic unit; arithmetic-logical unit; central processing unit; computing unit; control unit; functional unit; input unit; output unit; network unit; system unit.

Function: arithmetic function; checking function; complex function; computer function; continuous function; conversion function; distribution function; encoding function; logical function; numeric function; output function; program function; search function; software function; support function; utility function; variable function.

Control: access control; batch control; coding control; distance / remote control; error control; execution control; hardware control; input/output control; memory control; power control; production control; program control; rate control; self-acting control; software control; system control.

5. Вспомните значение следующих прилагательных и преобразуйте их в сравнительную и превосходную степени.

A. Small; fast; new; long; late; wide; young; easy; great; dull; rich; bulky; large; vast; early; old; broad.

B. Frequent; reliable; approximate; significant; intricate; possible; basic; remarkable; common; modern; dependent; general; necessary; successful; scientific; universal.

C. Good; bad; little; many.

6. Прочтите текст и скажите, какую дополнительную информацию вы узнали о действии основных устройств компьютера.

Some Features of a Digital Computer

It should be noticed that even in a large-scale digital system, such as in a computer, or in a data-processing, control or digital-communication system, there are only a few basic operations which must be performed. These operations may be operated many times. The four circuits most commonly employed in such systems are known as the *OR, AND, NOT and* **FLIP-FLOP**. They are called logic gates or circuits.

An electronic digital computer is a system which processes and stores very large amount of data and which solves scientificproblems of numerical computations of such complexity and with such speed that solution by human calculation is not feasible. So the computer as a system can perform numerical computations and follow instructions with extreme speed but it cannot program itself.

We know that the numbers and the instructions which form the program, the computer is to follow, are stored in an essential part of the computer called the memory. The second important unit of the computer is the control whose function is to interpret orders. The control must convert the command into an appropriate set of voltages to operate switches and carry out the instructions conveyed by the order. The third basic element of a computer is the arithmetic device which contains the circuits performing the arithmetic computations: addition, subtraction, etc. The control and arithmetic components are called the central processor. Finally a computer

requires appropriate input-output devices for inserting numbers and orders into the memory and for reading the final result.

Suppose a command to perform an addition or division has been transmitted to the central processor. In response to this order the control must select the correct operands from the memory, transmit them to the arithmetic unit and return to the

memory the result of the computation. The memory serves for storing not only the original input data, but also the partial results which will have to be used again as the computation proceeds.

Lastly, if the computation doesn't stop with the execution of this instruction and the storage of the partial result, the control unit must automatically pass on to the next instruction. The connection of the control unit back to the input permits insertion of more data when there is room in the memory.

Vocabulary

large-scale — большой; крупномасштабный

flip-flop — триггер

circuit ['sə:kit] — цепь; контур; схема

employ [im'plɔi] — использовать; употреблять; применять

logicgates — логический элемент; схема пропускания (сигналов); проход

feasible — возможный; выполнимый; осуществимый

interpretorders — интерпретировать, истолковывать команды

operateswitches — приводить в действие переключатели

convey [kən'vei] — передавать; сообщать

inresponseto — вответна

correctoperand — нужныйоперанд

originalinputdata — исходнаявводимаяинформация

proceed [prə'si:d] — продолжать(ся); возобновлять(ся); действовать

room — (свободное) место; свободная память

7. Просмотрите текст еще раз. Ответьте на вопросы, используя информацию текста.

1. What are the most commonly used circuits in any computer? 2. How are they called? 3. What kind of a system is a digital computer? 4. Is there anything that a computer cannot do itself? What is it? 5. Where are the instructions and digits stored? 6. What is the function of the control? 7. What does the arithmetic device serve for? 8. What components form the central processor? 9. What other devices in addition to the above-mentioned ones does a computer require? 10. How are computations performed in a computer?

8. Найдите в тексте английские эквиваленты следующих сочетаний:

Крупномасштабная цифровая система; система обработки данных; система цифровой связи; наиболее широко распространенные схемы; логические схемы; решать научные

проблемы; выполнять числовые вычисления; интерпретировать команды; приводить в действие переключатели; выполнять команды; нуждаться (требовать) в необходимом устройстве ввода-вывода; введение чисел и команд; считывание конечных результатов; передавать команду в центральный процессор; в ответ на; хранение частичных результатов; позволить введение новых данных; свободное место в памяти.

9. **Подберите пары или группы близких по значению слов из предложенных ниже. Переведите слова на русский язык.**

Verbs: relate, employ, insert, perform, remove, operate, show, interpret, select, issue, use, receive, perform, cause, print, make, compute, connect, execute, take away, require, act, convert, carry out, demand, permit, demonstrate, choose, transmit, type, store, get, calculate, proceed, continue, keep, allow.

Nouns: response, unit, component, computation, storage, gate, amount, digit, element, memory, instruction, device, equipment, connection, circuit, order, command, information, relation, quantity, answer, calculation, number, data.

Adjectives: broad, complete, each, appropriate, every, basic, essential, digital, original, full, wide, initial, major, large, numerical, common, necessary, usual, important, general, great.

Практическое занятие № 8.
Тема занятия: StorageUnits / Единицы хранения информации

Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.
В результате освоения темы студент должен:
знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;
уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;
владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.
Актуальность темы: обусловлена необходимостью овладения компетенцией УК-4.

Теоретическая часть:

Storage Units

Computer system architecture is organized around the primary storage unit because all data and instructions used by thecomputer system must pass through primary storage. Our discussion of computer system units will begin with the functions of the primary and secondary storage units. This leads to the examination of the central processing unit and from there to the consideration of the input and output units. Therefore, the sequence in which we'll describe the functional units of a digital computer is: 1) storage units, primary and secondary; 2) central processing unit; 3) input and output units.

As you know, there are primary and secondary storage units. Both contain data and the instructions for processing the data. Data as well as instructions must flow into and out of primary storage.

Primary storage is also called main storage or internal storage. The specific functions of internal storage are to hold (store): 1) all data to be processed; 2) intermediate results of process-

ing; 3) final results of processing; 4) all the instructions required for ongoing process. Another name for primary storage is memory, because of its similarity to a function of the human brain. However, computer storage differs from human memory in important respects. Computer memory must be able to retain very large numbers of symbol combinations, without forgetting or changing any details. It must be able to locate all its contents quickly upon demand. The combinations of characters, that is, the letters, numbers, and special symbols by which we usually communicate, are coded. The codes used by computer designers are based upon a number system that has only two possible values, 0 and 1.A number system with only two digits, 0 and I, is called *a binary number system*. Each binary digit is called a bit, from Binary digiT. As the information capacity of a single bit is limited to 2 alternatives, codes used by computer designers are based upon combinations of bits. These combinations are called *binary codes*. The most common binary codes are 8-bit codes because an 8-bit code provides for 2/8, or 256 unique combinations of 1's and0's, and this is more than adequate to represent all of the characters by which we communicate.
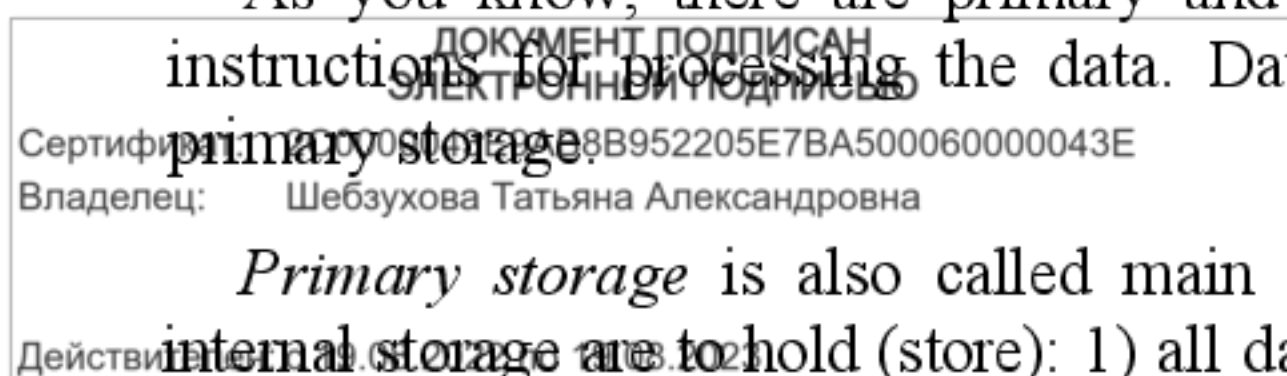
Data in the form of coded characters are stored in adjacent storage locations in main memory in two principal ways: 1) as "strings" of characters — in bytes; and 2) within fixed-size "boxes" — in words. A fixed number of consecutive bits that represent a character is called*a byte*. The most common byte size is 8-bit byte. *Words* are usually 1 or more bytes in length.

Secondary storage. Primary storage is expensive because each bit is represented by a high-speed device, such as a semiconductor. A million bytes (that is, 8 million bits) is a large amount of primary storage. Often it is necessary to store many millions, sometimes billions, of bytes of data. Therefore slower, less expensive storage units are available for computer systems. These units are called *secondary storage*. Data are stored in them in the same binary codes as in main storage and are made available to main storage as needed.

Vocabulary

primary / secondarystorage — первичное / вторичное запоминающее устройство

mainstorage — основная память; оперативное запоминающее устройство

internal storage [in'tə:nəl] — внутреннееЗУ

sequence ['sikwəns] — последовательность; порядокследования

intermediate results ['intə'midrətnsʌlts] — промежуточныерезультаты

ongoingprocess ['ɔngouiŋ 'prousəs] — продолжающийся, постоянный процесс

similarity [simi'læriti] — сходство; подобие

toretain [ri'tein] — сохранять; удерживать
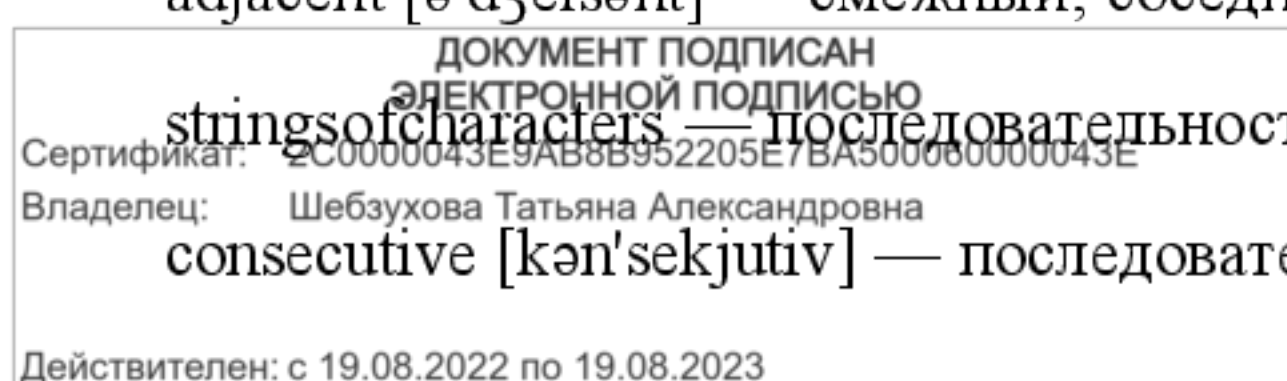
tolocate [lou'keit] — размещать(ся); располагать(ся)

value ['vælju:] — значение, величина; значимость, ценность; оценка

binarydigit ['bainəri 'didʒit] — двоичная цифра; двоичный знак

adjacent [ə'dʒeisənt] — смежный; соседний; примыкающий

stringsofcharacters — последовательность символов

consecutive [kən'sekjutiv] — последовательный; смежный; соседний

Вопросы и задания:

1. Просмотрите текст еще раз. Ответьте на вопросы, используя информацию текста.

1. What are the functional units of a digital computer? 2. What units make up the central processing unit? 3. How is computer system organized? 4. What are the two main types of storage units? 5. What do they contain? 6. What is the function of a primary storage? 7. Why is primary storage often called memory? 8. In what respect does computer memory differ from human memory? 9. What are codes based on? 10. What is Secondary storage and what is it used for

2. Найдите в тексте английские эквиваленты следующих словосочетаний:

Функциональный блок; цифровой компьютер; устройство ввода; устройство управления; арифметико-логическое устройство; центральный процессор; структура компьютерной системы; первичное запоминающее устройство; вторичное ЗУ; рассмотрение; поэтому последовательность; оперативное ЗУ; внутренняя память; промежуточные результаты; подобие функции человеческого мозга; размешать содержимое по требованию; система счисления; двоичная система счисления; возможные величины; объем информации; двоичный код; смежные ячейки памяти; последовательность символов; быстродействующее устройство; полупроводник; доступный.

3. Вспомните значение новых слов и попытайтесь перевести словосочетания, употребляемые с этими словами.

Storage: available storage; buffer storage; computer storage; data storage; magnetic disk storage; magnetic tape storage; input storage; intermediate storage; internal storage; laser storage; main storage; primary storage; secondary storage; sequential-access storage; variable storage; virtual storage.

Value: absolute value; acceptable value; additional value; binary value; byte value; character value; constant value; correct value; data value; digit value; discrete values; invalid value; negative value; numerical value; output value; valid value.

Digit: binary digit; binary-coded digit; check digit; information digit; input digit; nonsignificant digit; significant digit; digit-by-digit.

Sequence: out of sequence; alphabetic sequence; arithmetic sequence; binary sequence; character sequence; code sequence; instruction sequence;data sequence; digital sequence; historical sequence; increasing sequence; program sequence; string sequence.

4. Найдите в тексте слова, близкие по значению следующим:

Memory; element; information; command; examination; character; quantity; number; place; computer architect; likeness.

To apply; to form; to move; to hold; to demand; to connect; to supply; to place; to name; to start; to examine.

Continuous; significant; consecutive; usual; enough; main; initial; general.

5. Переведите предложения, содержащие Perfect ParticipleActive и Perfect Participle Passive.

1. *Having finished* the research the scientists made the analysis of the data obtained. 2. The designer left the office *having looked* through all the documents. 3. *Having discussed* the functions of storage units we passed on to the consideration of control processing unit. 4. *Having limited* the information capacity of a single bit to two alternatives the computer designers expressed data by a combination of bits. 5. *Having translated* the program into machine language the computer architect put the program into the machine. 6. *Having been coded the* instruction was transmitted to the central processing unit. 7. *Having been transmitted* to the central processing unit the instruction made arithmetic-logical unit perform some computations. 8. *Having been regulated* by the operator the equipment operated well. 9. Data *having been entered* correctly into the computer component of a data processing system, the need for further manipulation by humans is eliminated. 10. *Having been* well *prepared* for the examination the pupils could answer all the questions the teacher asked them.

6. Прочтите текст и скажите, как вы понимаете термин «запоминающая среда» и какие компоненты ее составляют. Переведите текст.

Storage Devices

Storage media are classified as primary storage or secondary storage on the basis of combinations*of cost, capacity, and access time. The *cost* of storage devices is expressed as the cost per bit of data stored. The most common units of cost are cents, millicents (0.001 cents) and microcents (0.000001 cents). The time required for the computer to locate and transfer data to and from a storage medium is called the *access time* for that medium. *Capacities* range from a few hundred bytes of primary storage for very small computers to many billions of bytes of archival storage for very large computer systems.

Memories may be classified as *electronic* or *electromechanical.* Electronic memories have no moving mechanical parts, and data can be transferred into and out of them at very high speeds. Electromechanical memories depend upon moving mechanical parts for their operation, such as mechanisms for rotating magnetic tapes and disks. Their data access time is longer than is that of electronic memories; however they cost less per bit stored and have larger capacities for data storage. For these reasons most computer systems use electronic memory for primary storage and electromechanical memory for secondary storage.

Primary storage has the least capacity and is the most expensive; however, it has the fastest access time. The principal primary storage circuit elements are solid-state devices: magnetic cores and semiconductors. For many years magnetic cores were the principal elements used in digital computers for primary storage. The two principal types of semiconductors used for memory are bipolar and metal-oxide semiconductors (MOS). The former is faster, the latter is more commonly used at present. Because data can be accessed randomly, semiconductor memories are referred to as *random-access memory,* or RAM.

There is a wide range of *secondary storage devices.* Typical hardware devices are rotating electromechanical devices. Magnetic *tapes, disks, and drums* are the secondary storage hardware most often used in computer systems for sequential processing. Magnetic tape, which was invented by the Germans during World War II for sound recording, is the oldest secondary storage medium in common use. Data are recorded in the form of small magnetized "dots" that can be arranged to represent coded patterns of bits.

Tape devices range from large-capacity, high-data-rate units used with large data processing systems to *cassettes* and *cartridges* used with small systems. Magnetic disk storage, introduced in the early 1960s, has replaced magnetic tape as the main method of secondary storage. As contrasted with magnetic tapes, magnetic discs can perform both sequential and random processing. They are classified as moving-head, fixed-head, or combination moving-head and fixed-

head devices. Magnetic discs are the predominant secondary storage media. They include flexible, or floppy discs, called diskettes. The "floppies" were introduced by IBM in 1972 and are still a popular storage medium to meet the demands of the microcomputer market.
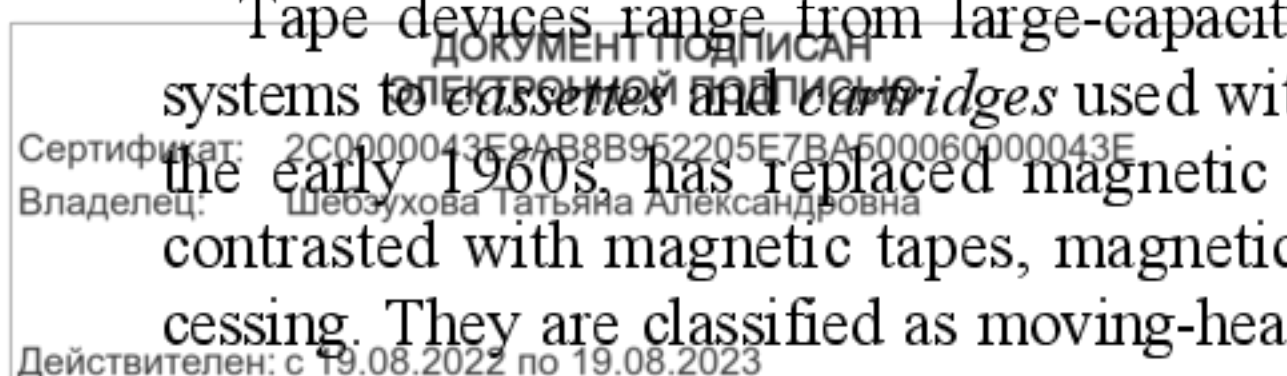
Vocabulary

medium (pl. media) — носитель; среда

capacity — емкость; объем (памяти); пропускная способность

mediacapacity — емкость носителя

dataaccesstime — время доступа к данным

perbit — на единицу информации

totransfer — передавать(ся); переносить(ся); пересылать(ся)

archivalstorage — архивное ЗУ; архивная память

todepend — зависеть от; полагаться, рассчитывать на

torotate — вращать(ся); чередовать(ся); сменять(ся)

reason — причина; основание; довод; обосновывать; делать вывод

solid-statedevice — твердотельный прибор magneticcore — магнитный сердечник

bipolarsemiconductor — биполярный полупроводник

metal-oxidesemiconductor (MOS) — структура металл-оксид-полупроводник

randomly — произвольно

random-accessmemory (RAM) — оперативное запоминающее устройство (ОЗУ)

soundrecording — звукозапись

toarrange — размещать; располагать; устанавливать; монтировать

tapedevice — ЗУ на магнитной ленте

torange — классифицировать; располагать в порядке; лежать в диапазоне

magneticdiscsstorage — ЗУ на магнитном диске

moving-headdevice — устройство с двигающейся головкой

predominant — преобладающий; доминирующий

flexible — гибкий; настраиваемый; изменяемый

floppy (disk) — гибкий диск(ета); ЗУ на гибком диске

tomeetthedemands — удовлетворять потребности

7. Ответьте на вопросы, используя информацию текста.

1. How are storage media classified? 2. How is the cost of storage devices expressed? 3. What is the access time for storage media? 4. How does the storage capacity range? 5. What are

the two main types of storage devices? 6. What are electronic storage devices? 7. What are the principal primary storage circuit elements? 8. What are the main secondary storage devices? 9. What is the oldest secondary medium and when was it invented? 10. Whatisafloppy?

8. Найдите в тексте английские эквиваленты следующих словосочетаний:

Запоминающие устройства; носители памяти; первичные ЗУ; вторичные ЗУ; время доступа; стоимость ЗУ; диапазон емкости памяти; архивная память; движущиеся механические части; вращающиеся магнитные ленты и диски; по этим причинам; твердотельные устройства; магнитные сердечники; полупроводники; оперативное ЗУ; аппаратное обеспечение вторичной памяти; звукозапись; . намагниченные точки; представлять зашифрованную комбинацию единиц информации; в отличие от магнитных лент; последовательная и произвольная обработка; устройства с движущейся и фиксированной головкой; удовлетворять потребности; гибкий диск.

9. Переведитепредложения, содержащиевсевозможныеформыпричастий: Particle I, Particle II, Perfect Participle Active и Perfect Participle Passive.

1. Electromechanical memories depend upon *moving* mechanical parts for their operation. 2. The time *required* for the computer to locate and transfer data to and from a storage medium is called the access time. 3. *Being* not visible software makes possible the effective operation of computer system. 4. *Having invented* magnetic tapes the Germans used them as the secondary storage medium. 5. *When* properly *programmed* computers don't make computational errors. 6. *Having been introduced* in the early 1960s magnetic disc storage has replaced magnetic tape storage. 7. The control unit *interpreting* instructions is one of the important parts of any computer system. 8. Data *recorded* in the form of *magnetized* dots can be arranged to represent *coded* patterns of bits. 9. *As contrasted* with magnetic tapes magnetic discs can perform both sequential and random processing. 10. *While having* no *moving* mechanical parts electronic memories can transfer data at very high speed.

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Практическое занятие № 9.
Тема занятия: CentralProcessingUnit/ Центральный процессор

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Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.
В результате освоения темы студент должен:
знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;
уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;
владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.
Актуальность темы: обусловлена необходимостью овладения компетенцией УК-4.

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Теоретическаячасть:

Central Processing Unit

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It is well known in computer science that the words "computer" and "processor" are used interchangeably. Speaking more precisely, "computer" refers to the central processing unit (CPU) together with an internal memory. The internal memory, control and processing components

make up the heart of the computer system. Manufactures design the CPU to control and carry out basic instructions for their particular computer.

The CPU coordinates all the activities of the various components of the computer. It determines which operations should be carried out and in what order. The CPU controls the operation of the entire system by issueing commands to other parts of the system and by acting on responses. When required it reads information from the memory, interprets instructions, performs operations on the data according to the instructions, writes the results back into the memory and moves information between memory levels or through the input-output ports.

In4igital computers the CPU can be divided into two functional units called the control unit (CU) and the arithmetic-logical unit (ALU). These two units are made up of electronic circuits with millions of switches that can be in one of two states, either on or off.

The function of the CU within the central processor is to transmit coordinating control signals and commands. The control unit is that part of the computer that directs the sequence of step-by-step operations of the system, selects instructions and data from memory, interprets the program instructions, and controls the flow between main storage and the arithmetic-logical unit.

The ALU, on the other hand, is that part of the computer in which the actual arithmetic operations, namely, addition, subtraction, multiplication, division and exponentiation, called for in the instructions are performed.

Programs and the data on which the CU and the ALU operate, must be in internal memory in order to be processed. Thus, if located in secondary memory devices, such as disks or tapes, programs and data are first loaded into internal memory.

Vocabulary

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

interchangeably['intə'tʃeindʒəbli] – взаимозаменяемым образом

precisely [pri'saisli] — точно

internalmemory - внутренняя память; внутреннее ЗУ

activity [ək'tiviti] - деятельность; работа; действия операции

toissue ['isjuː] - посылать (сигнал); выводить, выдавать (сообщение)

response [ri'spɔns] - ответ; отклик; реакция; отвечать; реагировать

tointerprete [in'təprit] - интерпретировать; истолковывать;

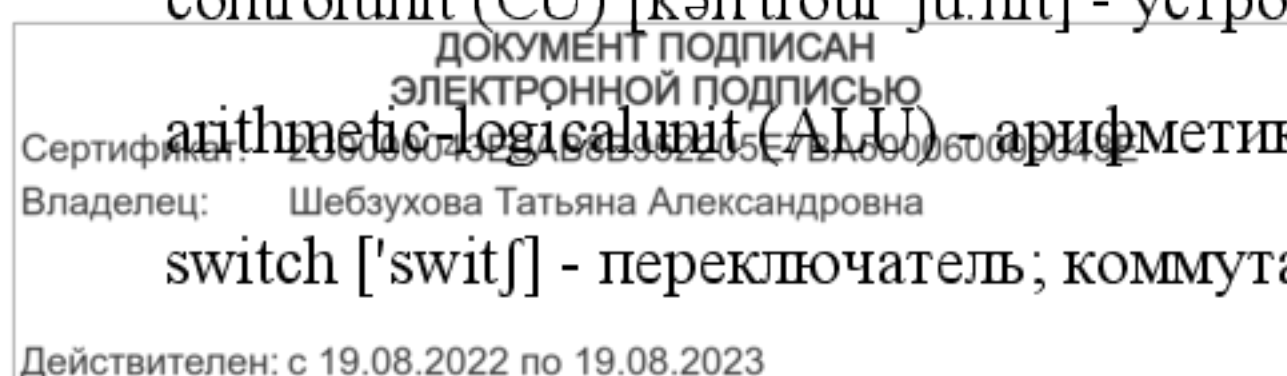accordingto [əkɔbdintə] - согласно; в соответствии с

level - уровень; степень; мера; выравнивать

input-outputport - порт ввода-вывода

controlunit (CU) [kən'troul 'juːnit] - устройство управления

arithmetic-logicalunit (ALU) — арифметико-логическое устройство

switch ['switʃ] - переключатель; коммутатор; переключать; переходить

direct [di'rekt] - направлять; адресовать; указывать; прямой; непосредственный

step-by-step operations – пошаговыеоперации

toselect [sə'lekt] - выбирать; выделять (на экране)

ontheotherhand - с другой стороны

exponentiation [ekspə'nenʃi'eiʃn] - возведение в степень

Вопросы и задания:

1. **Просмотрите текст еще раз. Ответьте на вопросы, используя информацию текста.**

1. What words in computer science are used interchangeably and why? 2. What components make up the heart of the computer system. 3. What is the function of the CPU? 4. In what way does the CPU control the operation of the whole system? 5. Name the sequence of operations the CPU performs (use five verbs). 6. What are the CPU functional units made of? 7. What is the function of the CU? 8. What operations are performed in the ALU? 9. Where are data processed? 10. Where are data to be processed loaded into?

2. **Найдите в тексте английские эквиваленты следующихсловосочетаний:**

Хорошо известно; к компьютеру относятся; внутренняя память; составлять суть; выполнять; координировать деятельность; определяя в каком порядке; управлять работой всей системы; при необходимости; в соответствии с командами; уровни памяти; порт ввода-вывода; переключатели; режим включения или выключения; передавать сигналы; указывать последовательность пошаговых операций; основная память; управлять ходом выполнения программы; с другой стороны; выполнять вычитание, сложение, возведение в степень, деление, умножение; для того чтобы.

3. **Вспомните значение новых слов и попытайтесь перевести словосочетания, употребляемые с этими словами.**

Direction: backward direction; clockwise direction; counterclockwise direction; data direction; forward direction; inverse / reverse direction; negative direction; positive direction; printing direction; transmission direction.

Level: access level; application level; data level; device level; difficulty level; error level; function level; hardware level; high level; input level; output level; performance level; presentation level; program level; protection level; resource level; security level; software level; structural level; system level; transmisson level.

Processor: arithmetic processor; central processor; command processor; control processor; data processor; error processor; general-purpose processor; special-purpose processor; image processor; language processor; mail processor; message processor; numeric processor; parallel processor; peripheral processor; text processor.

Switch: to switch between programs; to switch between windows; to switch disks; to switch on; to switch off; to switch over; binary switch; command switch.

Step: conversion step; final step; procedure step; program step; programming step; step by step; one step at a time; to step down; to step out; to step up; to take steps.

4. **Переведите предложения, содержащие независимыйпричастный оборот.**
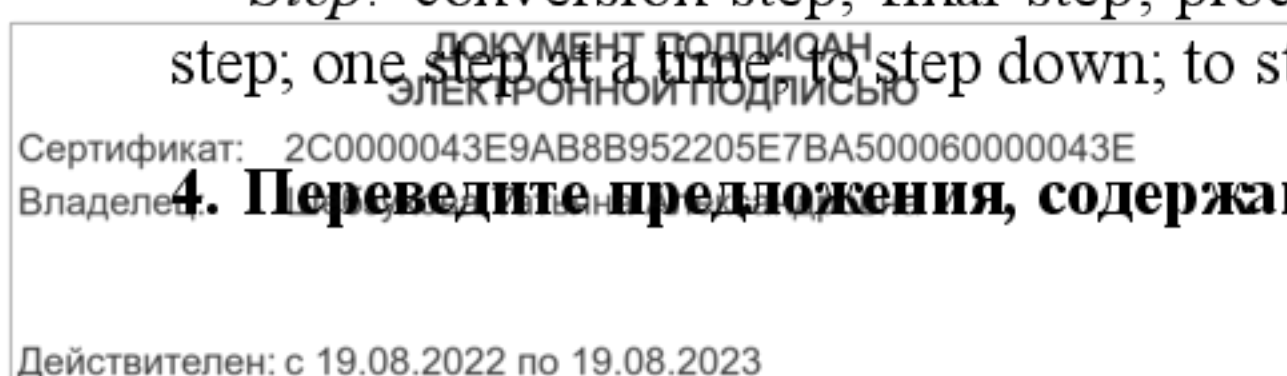
1. *Data being accessed randomly,* semiconductor memories are called random access memory (RAM). 2. *The information capacity of a single bit being limited to two alternatives,* codes are based on combination of bits. 3. *Primary storage having similarity to a function of the human brain,* the storage is also called memory. 4. An electron leaving the surface, the metal becomes positively charged. 5. *Computer system architecture being organized around the primary storage unit,* all instructions must pass through it. 6. Computer system architecture is organized around the primary storage unit, *all instructions passing through it.* 7. Electromechanical memories depend upon moving mechanical parts, *their data access time being longer than is that of electronic memories.* 8. For this reason most computer systems use electronic memory for primary storage, *electromechanical memory being used for secondary storage.* 9. Large capacity tape devices are used with large data processing systems, *cassettes and cartridges being applied with small systems.* 10. The CPU controls the operation of the entire system, commands being issued to other parts of the system.

5. Прочтите текст и скажите, о каких компонентах центрального процессора и их назначении вы узнали. Переведитетекст.

The CPU Main Components

As it is known the two functional units of the CPU are the control unit (CU) and the arithmetic-logical unit (ALU). The control unit manages and coordinates the entire computer system. It obtains instructions from the program stored in main memory, interprets the instructions, and issues signals that cause other units of the system to execute them.

The control unit operates by reading one instruction at a time from memory and taking the action called for by each instruction. In this way it controls the flow between the main storage and the arithmetic-logical unit.

The control unit has the following components: *a counter* that selects the instructions, one at a time, from memory; *a register* that temporarily holds the instructions read from memory while it is being executed; *a decoder that* takes the coded instruction and breaks it down into individual commands necessary to carry it out; *a clock,* which produces marks at regular intervals. These timing marks are electronic and very rapid.
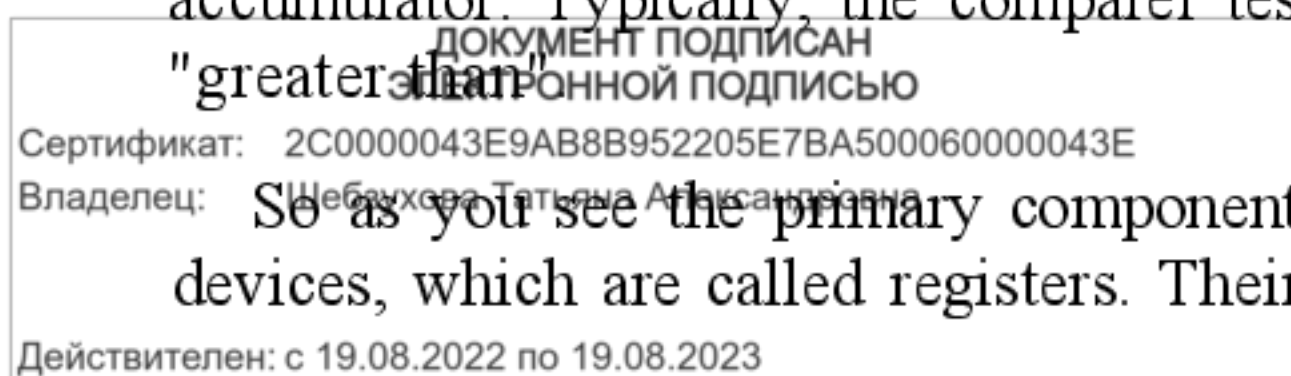
The sequence of control unit operations is as follows. The next instruction to be executed is read out from primary storage into the storage register. The instruction is passed from the storage register to the instruction register. Then the operation part of the instruction is decoded so that the proper arithmetic or logical operation can be performed. The address of the operand is sent from the instruction register to the address register. At last the instruction counter register provides the address register with the address of the next instruction to be executed.

The arithmetic-logical unit (AL U) executes the processing operations called for by the instructions brought from main memory by the control unit. Binary arithmetic, the logical operations and some special functions are performed by the arithmetical-logical unit.

Data enter the ALU and return to main storage through the *storage register.* The *accumulator* serving as a register holds the results of processing operations. The results of arithmetic operations are returned to the accumulator for transfer to main storage through the storage register. The *comparer* performs logical comparisons of the contents of the storage register and the accumulator. Typically, the comparer tests for conditions such as "less than", "equal to", or "greater than".

So as you see the primary components of the arithmetic-logical unit are banks of bistable devices, which are called registers. Their purpose is to hold the numbers involved in the cal-

culation and hold the results temporarily until they can be tranferred to memory. At the core of the ALU is a very highspeed binary adder, which is used to carry out at least the four basic arithmetic functions (addition, subtraction, multiplication and division). The logical unit consists of electronic circuitry which compares information and makes decisions based upon the results of the comparison.

Vocabulary

to manage ['mænidʒ] — управлять; организовывать; справляться

to obtain [əb'tein] — получать; достигать; добиваться

to cause — заставлять; вынуждать; вызывать; быть причиной; причина, основание

flow ['flou] — поток; ход (выполнения программы); последовательность

counter ['kauntə] — счетчик

register ['redʒistə] — регистр; устройство регистрации; счетчик; датчик

instruction register — регистр команд

storage register — регистр памяти; запоминающий регистр

address register — адресныйрегистр

temporarily ['tempərərili] — временно

decoder [di'koudə] — дешифратор

operandaddress [ɔpə'ra:nd ə'dres] — адрес (хранения) операнда

mark ['ma:k — отметка; маркер; знак; помечать; обозначать; выделять

timingmark — отметка времени

accumulate [ə'kju:mjuleit] — накапливать(ся); суммировать; собирать(ся)

accumulator — сумматор; накапливающий регистр; устройство суммирования

compare [kəm'pɛə] — сравнивать; соотноситься

omparer [kəm'pɛərə] — компаратор; устройство сравнения

content ['kɔntənt]— содержимое; смысл; объем; количество

involve [in'vɔlv] — включать; содержать; заключать (в себе)

core ['kɔ:] — суть; основная часть; ядро; оперативная память

add ['æed] — складывать; суммировать; прибавлять; присоединять

added — добавочный; дополнительный

adder — сумматор; блок суммирования

atleast — по крайней мере

6. Ответьте на вопросы, используя информацию текста.

1. What are the functional units of CPU? 2. What is the function of CU? 3. How does CU operate? 4. What is the function of a counter? 5. What role does a decoder play? 6. What is the sequence of CU operations? 7. What is the function of the arithmetic-logical unit? 8. What operations are performed by ALU? 9. What primary components does ALU consist of? 10. What is the function of an accumulator / comparer?

7. Найдите в тексте английские эквиваленты следующих словосочетаний:

Функциональные блоки; устройство управления; арифметико-логическое устройство; управлять работой всей системы; получать команды; основная память; посылать сигналы; считывать команды поэтапно; таким образом; временно сохранять информацию; производить пометки через равные промежутки времени; последовательность операций; регистр памяти; регистр команд; адресный регистр; счетчик; датчик; дешифратор; адрес операнда; адресный регистр, высокоскоростной двоичный сумматор; по крайней мере; вычитание; сложение; умножение; деление; принимать решения; результаты сравнения.

8. Вспомните значение новых слов и попытайтесь перевести словосочетания, употребляемые с этими словами.

Register, address register; base register; clock register; command / instruction register; counter register; CPU register; hardware register; input / output register; memory register; operand register; general-purpose register; special-purpose register.

Counter binary counter; character counter; data counter; instruction counter; pulse counter; sequence counter; storage counter; software counter; time-out counter.

Selection: color selection; directory selection; drive selection; file selection; function selection; keyboard selection; menu selection; security selection

Management: data management; database management; disk management; error management; information management; memory management; network management; resource management; task management; window management.

9. Найдите в текстах слова, близкие по значению следующим:

Verbs: to work; to control; to receive; to keep; to send; to perform; to demand; to choose; to supply; to pass; to name; to include; to apply; to come back; to found; to explain; to form; to define; to arrange.

Nouns: computer; answer; commands; memory; element; device; information; state; aim; heart; solution; computation.

Adjectives: main; whole; separate; quick; correct; large; main (storage); following; every; following; specific; different; real.

10. Сравните и проанализируйте предложения, содержащие зависимый и независимый причастные обороты. Переведите их.

1. Having returned to the accumulator the results of arithmetic operations are transferred to main storage. The results of arithmetic operations are returned to the accumulator, the storage register transfering them to main memory. The results of arithmetic operations being returned to the accumulator, the storage register transfer them to main memory. Being returned to the accumulator the results of arithmetic operations are transferred to main memory.

2. When passing through a conductor free electrons form an electric current. Free electrons passing through a conductor, an electric current is generated. Free electrons pass through a con-

ductor, an electric current being generated. Free electrons passing through a conductor form an electric current.

3 Instructions being obtained, the control unit causes other units to perform the necessary operations. Instructions are obtained, the control unit causes other units to perform the operations. Having obtained the instructions the control unit causes other units to perform the operations. Obtaining the instructions the control unit causes other units to perform the operations.

4. The elements having unknown properties cannot be used for experiments. The elements have unknown properties, experiments with these elements being impossible. Having unknown properties the elements cannot be used for experiments. The elements having unknownproperties, experiments with them are impossible.

5. When moving in a material charged particles (заряженныечастицы) produce magnetic properties (свойства) of this material. Charged particles moving in a material produce magnetic properties. Charged particles moving in a material, magnetic properties of this material are produced. Charged particles move in a material, magnetic properties of the material being produced.

Раздел 3.Input-OutputDevices / Устройства ввода-вывода информации

Практическое занятие № 10.
Тема занятия: Input-OutputEnvironment/Режим работы устройств ввода-вывода

Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.
В результате освоения темы студент должен:
знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;
уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;
владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.
Актуальность темы: обусловлена необходимостью овладения компетенцией УК-4.

Теоретическая часть:

Input-Output Environment

Data and instructions must enter the data processing system, and information must leave it. These operations are performed by input and output (I/O) units that link the computer to its external environment.

The I/O environment may be human-related or human-independent. A remote banking terminal is an example of a human-related input environment, and a printer is an example of

a device that produces output in a human-readable format. An example of a human-independent input environment is a device that measures traffic flow. A reel of magnetic tape upon which the collected data are stored in binary format is an example of a human-independent output.

Input-Output Interfaces, Data enter input units in forms that depend upon the particular device used. For example, data are entered from a keyboard in a manner similar to typing, and this differs from the way that data are entered by a bar-code scanner. However, regardless of the forms in which they receive their inputs, all input devices must provide a computer with data that are transformed into the binary codes that the primary memory of the computer is designed to accept. This transformation is accomplished by units called I/O interfaces. Input interfaces are designed to match the unique physical or electrical characteristics of input devices to the requirements of the computer system. Similarly, when output is available, output interfaces must be designed to reverse the process and to adapt the output to the external environment. These I/O interfaces are also called channels or input-output processors (IOP).

The major differences between devices are the media that they use and the speed with which they are able to transfer data to or from primary storage.

Input-Output Device Speed. Input-output devices can be classified as high-speed, medium-speed, and low-speed. The devices are grouped according to their speed. It should be noted that the high-speed devices are entirely electronic in their operation or magnetic media that can be moved at high speed. Those high-speed devices are both input and output devices and are used as secondary storage. The low-speed devices are those with complex mechanical motion or operate at the speed of a human operator. The medium-speed devices are those that fall between — they tend to have mechanical moving parts which are more complex than the high-speed devices but not as complex as the low-speed.

High-speed devices: magnetic disk; magnetic tape.

Medium-speed devices: card readers; line printers; page printers; computer output microfilms; magnetic diskette; optical character readers; optical mark readers; visual displays.

Low-speed devices: bar-code readers; character printers; digitizers; keyboard input devices; plotters; voice recognition and response units.

Vocabulary

environment [in'vaiərəmənt] — среда; окружение; режим работы;

externalenvironment — внешняя среда

human-related ['hju:mənri'leitid] — (взаимо)связанный с человеком

human-independent — независимый от человека

remoteterminal [ri'mout 'tə:minəl] — удаленный терминал

reel of magnetic tape — бобина с магнитной лентой

input-outputinterface — интерфейс (сопряжение, место стыковки) ввода-вывода

scan ['skæn] — просматривать; сканировать; развертывать

scanner ['skænə] — сканер; устройство оптического считывания

bar-codescanner / bar-codereader — устройство считывания штрих-кода

regardless of [ri'ga:dləs əv] — несмотря на; независимо от

to match characteristics ['mætʃkærəktə'ristiks] — сопоставлятьпараметры

similarly ['similəli] — подобным образом; также; аналогично
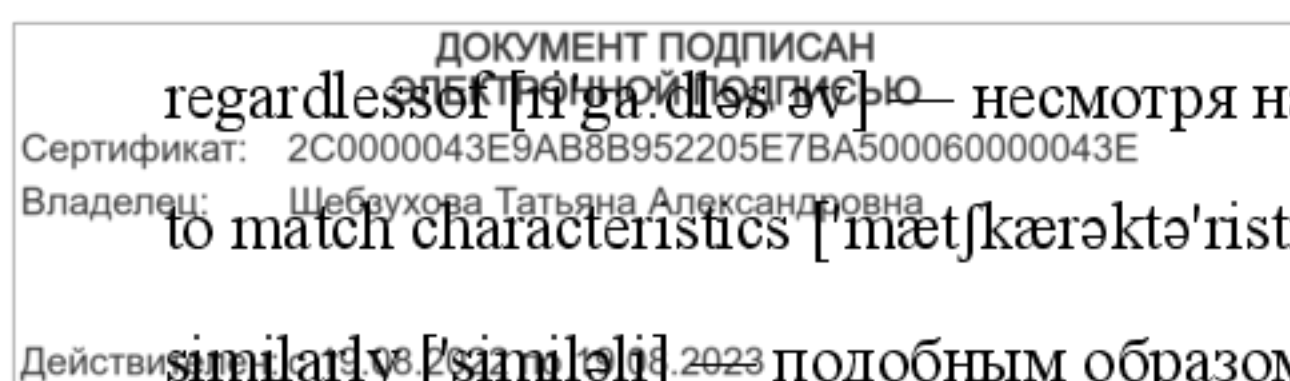
tofallbetween — падать; попадать в интервал между

cardreader — устройство считывания платы (карты)

lineprinter — построчный принтер; принтер печатания строки

pageprinter — принтер с постраничной печатью

characterprinter — принтер с посимвольной печатью

opticalcharacterreader — оптическое считывающее устройство текста

opticalmarkreader— оптическое считывающее устройство знаков

visualdisplay ['vizjuǝldis'plei]— визуальный индикатор

digitizer [didʒi'taizǝ] — аналого-цифровой преобразователь; сканер

keyboardinputdevice — клавишное устройство ввода

plotter ['plɔtǝ] — графопостроитель

voicerecognitionandresponseunit — устройство распознавания голоса и реагирования

Вопросы и задания:

1. Дайте ответы на следующие вопросы:

1. What is the purpose of input and output devices? 2. What types of input-output devices do you know? 3. Why are data transformed into a binary code while entering the input device? 4.Give an example of a human independent output. 5. What isan I/O interface? 6. What are the major differences between thevarious I/O devices? 7. What types of I/O devices tend to behigh-speed devices? 8. What types of devices tend to be low-speed devices?

2. Найдите в тексте английские эквиваленты следующихсловосочетаний:

Среда устройств ввода-вывода; система обработки информации; внешняя среда; связан с человеком; независим от человека; удаленный банковский терминал; измерять поток данных; бобина с магнитной лентой; хранить собранную информацию; двоичный формат; интерфейс ввода-вывода; вводить с клавиатуры; устройство считывания штрих-кода; не смотря на; преобразовать в двоичный код; сопоставлять параметры; подобным образом; интерфейс вывода; изменить процесс в обратном направлении; настроить устройство ввода-вывода к внешней среде; главное отличие; основная память; вторичная память; низкоскоростные устройства; в соответствии.

3. Вспомните значение новых слов и попытайтесь перевести словосочетания, употребляемые с этими словами.

Environment: application environment; communication environment; execution environment; external environment; hardware environment; interface invironment; management environment; multimedia environment; network environment; processing environment; security environment; software environment; user environment.

Interface: character interface; common interface; data interface; database interface; display interface; external interface; flexible interface; floppy-disk interface; general-purpose interface; hardware interface; low-level interface
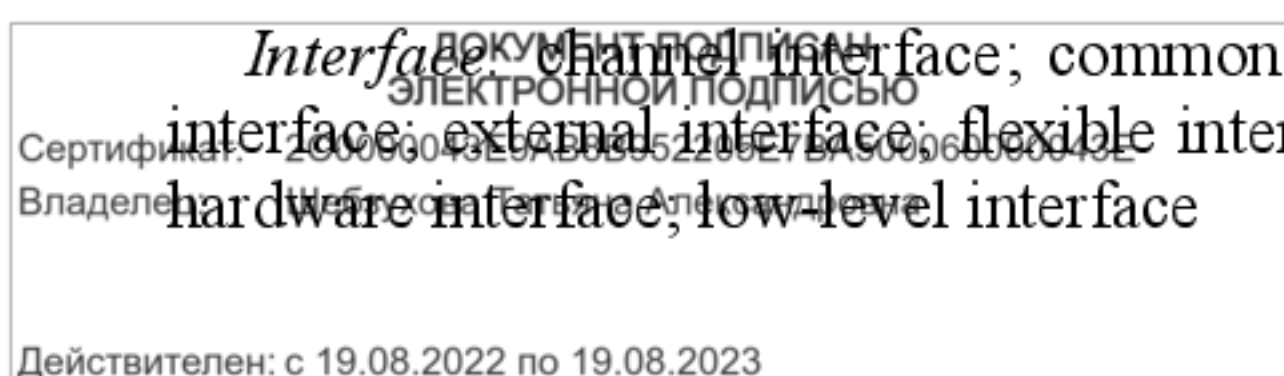
Scanner: bar code scanner; black-and-white scanner; color scanner; desktop scanner; hand scanner; laser scanner; manual scanner; optical scanner; visual scanner.

Terminal: batch terminal; desktop terminal; display terminal; printer terminal; remote terminal; security terminal; logical terminal; text terminal.

4. Определите видо-временную форму, выделите инфинитив, проанализируйте и переведите следующие предложения.

1. A printer is an example of a device *to produce* output in a human-readable format. *2.* The high-speed devices *to be used* as secondary storage are both input and output devices. 3. The progress of electronics *to have resulted* in the invention of electronic computers was a breakthrough (прорыв) of the second part of the 20th century. 4. Mendeleyev's periodic law *to have been accepted* as a universal law of nature is of great importance nowadays. 5. When output is available, output interfaces must be designed *to reverse* the process and *to adopt* the output to the external environment. 6. The memory stores the instructions and the data *to be* quickly *retrieved* on demand by the CPU. 7. Computers *to have been designed* originaly for arithmetic purposes are applicable for great variety of tasks at present. 8. The film *to have been running* for over a month this year attracts attention of many spectators. 9. The CPU of a computer *to bearranged* in a single or very small number of integrated circuitsis called a microprocessor. 10. Russia was the first country *tostart* the cosmic era.

5. Прочтите внимательно текст, составьте аннотацию на английском языке, озаглавьте текст. Для составления аннотации используйте следующие клише:

The text / article under review ...(gives us a sort of information about...) The article deals with the problem ...

The subject of the text is...

At the beginning (of the text) the author describes... (dwellson ...; explains...; touches upon...; analyses...; comments ...; characterizes ...; underlines ...; reveals...; gives account of...)

The article begins with the description of..,, a review of..., the analysis of... The article opens with ...

Then (after that, further on, next) the author passes on to ..., gives a detailed (thorough) analysis (description), goes on to say that ...

To finish with, the author describes ... At the end of the article the author draws the conclusion that ...; the author sums it all up (by saying...) In conclusion the author...

* * *

As it is well known, a computer cannot perform or complete any useful work unless it is able to communicate with its external environment. All data and instructions enter and leave the central processing unit through primary storage. Input-output devices are needed to link primary storage to the environment, which is external to the computer system. So input devices are used to enter data into primary storage. Output units accept data from primary storage to provide users with information or to record the data on a secondary storage device. Some devices are used for both the input and output functions.

The data with which these devices work may or may not be in a form that humans can understand. For example, the data that a data entry operator keys into the memory of a computer by typing on a keyboard are readable by humans. However, the data that tell a computer about the performance of an automobile engine are not in a form that humans can

read. They are electrical signals from an analog sensor. Similarly, output may be on a printed page, which humans can read easily, or upon some other medium where the data are not visible, such as on magnetic tape or disk.

As we know, all of the data flow from input to final output is managed by the control unit in the CPU. Regardless of the nature of the I/O devices, special processors called I/O interfaces

Практическое занятие № 11.

Тема занятия: InputDevices/Устройства ввода информации

Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.
В результате освоения темы студент должен:
знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;
уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;
владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.
Актуальность темы: обусловлена необходимостью овладения компетенцией УК-4.

Теоретическаячасть:

Input Devices

There are several devices used for inputting information into the computer: a keyboard, some coordinate input devices, such as manipulators (a mouse, a track ball), touch panels and graphical plotting tables, scanners, digital cameras, TV tuners, sound cards etc.

When personal computers first became popular, the most common device used to transfer information from the user to the computer was *the keyboard*. It enables inputting numerical and text data. A standard keyboard has 104 keys and three more ones informing about the operating mode of light indicators in the upper right corner.

Later when the more advanced graphics became to develop, user found that a keyboard did not provide the design capabilities of graphics and text representation on the display. There appeared manipulators, a mouse and a track ball, that are usually used while operating with graphical interface. Each software program uses these buttons differently.

The mouse is an optic-mechanical input device. The mouse has three or two buttons which control the cursor movement across the screen. The mouse provides the cursor control thus simplifying user's orientation on the display. The mouse's primary functions are to help the user draw, point and select images on his computer display by moving the mouse across the screen.

In general software programs require to press one or more buttons, sometimes keeping them depressed or double-click them to issue changes in commands and to draw or to erase emages. When you move the mouse across a flat surface, the ball located on the bottom side of the mouse turns two rollers. One is tracking the mouse's vertical movements, the other is tracking horizontal movements. The rotating ball glides easily, giving the user good control over the textual and graphical images.

In portable computers *touch panels or touch pads* are used instead of manipulators. Moving a finger along the surface of the touch pad is transformed into the cursor movement across the screen.

Graphical plotting tables (plotters) find application in drawing and inputtig manuscript texts. You can draw, add notes and signs to electronic documents by means of a special pen. The quality of graphical plotting tables is characterized by permitting capacity, that is the number of lines per inch, and their capability to respond to the force of pen pressing.

Scanner is used for optical inputting of images (photographies, pictures, slides) and texts and converting them into the computer form.

Digital videocameras have been spread recently. They enable getting videoimages and photographs directly in digital computer format. Digital cameras give possibility to get high quality photos.

Sound cards produce sound conversion from analog to digital form. They are able to synthesize sounds. Special game-ports and joysticks are widely used in computer games.

Vocabulary

keyboard ['kiːbɔːd] — клавиатура

key [kiː] — клавиша; кнопка; переключатель; ключевой, основной; главный; переключать; набирать на клавиатуре

manipulator [mənipjuˈleitə] — манипулятор; блок обработки

trackball ['trækbɔːl] — трекбол

touch panel ['tʌʃ 'pænl] — сенсорная панель

graphic plotting tables ['græfik 'plɔtiŋ 'teibls] — графические планшеты

sound card ['saund 'kaː] — звуковая карта (плата)

enable [iˈneibl] — разрешать; позволять; допускать; делать возможным

operating mode [əpəˈreitiŋ 'moud] — режим работы

press a button — нажать на кнопку

keep buttons depressed — удерживать кнопки в нажатом состоянии

double-click ['dʌbl 'klik] — двойное нажатие

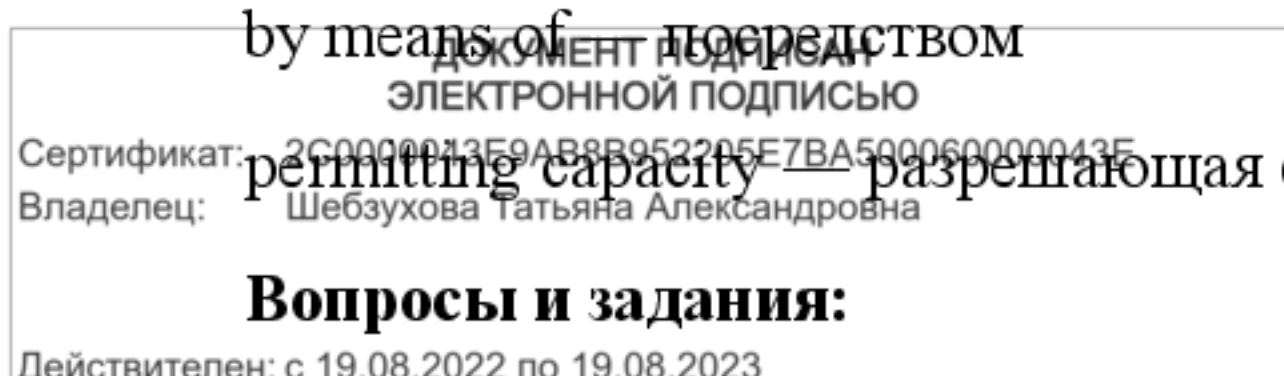erase images [iˈreiz 'imidʒiz] — удалить, стереть изображение (объект)

roller ['rɔlə] — ролик; валик

track — следить; прослеживать; проходить; след; траектория; путь; дорожка; соединение

by means of — посредством

permitting capacity — разрешающая способность

Вопросы и задания:

1. Ответьте на вопросы, используя информацию текста.

1. What devices are used for inputting information into the computer? 2. What was the most common device in early personal computers? 3. What is the function of a keyboard? 4. Why do many users prefer manipulators to keyboard? 5. How does the mouse operate? 6. What is its function? 7. What role does the ball on the bottom of the mouse play? 8. What is used in portable computers instead of manipulators? 9. What is the touch pad's principle of operation? 10. Where do graphical plotting tables find application?

2. Найдите в тексте английские эквиваленты следующих словосочетаний:

Введение информации; координатные устройства ввода; манипуляторы; мышь; трекбол; сенсорная панель; графические планшеты; цифровые камеры; сканеры; ТВ тюнеры; стандартная клавиатура; числовая и текстовая информация; световые индикаторы; клавиши; режим работы; презентация текста на мониторе; графический интерфейс; программные средства; оптико-механическое "устройство ввода; управлять движением курсора; упрощать ориентацию пользователя на экране; указывать и выбирать изображения; удерживать кнопки в нажатом состоянии; двойное нажатие; стирать объекты; ровная поверхность; вращать ролики; следить за вертикальным движением; легко скользить; портативный компьютер; рукописный текст; посредством; разрешающая способность.

3. Вспомните значение новых глаголов и переведите слова, производные от них.

To accomplish: accomplished; unaccomplished; accomplishment.

To adapt, adaptable; unadaptable; adaptability; unadaptabil-ity; adaptation; adapter.

To digitize: digit; digital; digitization; digitizer.

To erase: erasable; erasability; eraser; erasing; erasure.

To match: matcher; matching.

To permit: permitted; permissible; permissibility; permission.

To print: printable; printed; printer; printing;

To scan: scanning; scanner.

To recognize: recognition; recognizer; recognizable; unrecognizable.

To respond: response; responsible; irresponsible; responsibility; irresponsibility.

To reverse: reversed; reversible; irreversible; reversion; reversibility.

To transform: transformer; transformation; transformational; transformative

4. Проанализируйте предложения, содержащие конструкции "for + Infinitive" и "Objective with the Infinitive". Переведите предложения на русский язык.

1. It was not difficult *for the pupils to understand* the function of the mouse in computer operation. 2. There is no reason *for computer experts to use* computers of the first generation nowadays. 3. The mechanism is provided with special devices/or *the whole system to function automatically.* 4. The text was very interesting but rather difficult *for the students to translate* it without a dictionary. 5. It is not easy *for me to learn* to speak English fluently. 6. We know *the machine to react* to a series of electrical impulses that can be represented in binary numbers. 7.

Scientists considered *silicon to be* one of the best materials for the creation of an 1C. 8. Wfe know *all data to be translated* into binary code before being stored in main storage. 9. Engineers expect *these new devices to be tested* very soon. 10. They want *their son to become* a computer operator and to design new computer models.

5. Прочтите текст и выберите правильные ответы на поставленные ниже вопросы к тексту.

From the History of Computer Development in Russia

As it is well known, Russian scientists made great contribution into the development of computers. Russian mathematician P. Chebyshev who lived in the 19th century was interested in calculators. Among many other mechanisms invented by him there was an arithmometer designed in 1876. It was one of the most unique calculating machines of the time. At the beginning of the 20th century Academic A. Krylov constructed a mechanical integrator for solving differential equations.

The first Soviet computer, a small-size computing machine (MESM) was tested in 1950 under Academician S. Lebedev. Next year it was put into operation. In a year MESM was followed by BESM, a large-size electronic computing machine, with 8000 operations per second.

Serial production of computers in the USSR has been started since 1953. That year U. Basilevsky headed the design and manufacture of computer STRELA. 1958 witnessed the production of M-20, computers of the first generation under the guidance of S. Lebedev. The first generation of electron tube computers was followed by the second generation of foto transistor computers, using magnetic logic elements.

Starting with 1964 semiconductor computers — URAL, BESM-4 and M-220 were produced. Under Academician Glushkov small-size computers MIR, MIR-2 and DNEPR were designed and tested at the Institute of Cybernetics.

In the late 60s together with other members of the Council of Mutual Economic Assistance the Soviet Union started on the program of Unified Computer System, the program concerned with the third generation of computers with high-speed performance and program compatibility (совместимость).

1. What was one of the first achievements in the sphere of calculating in Russia?

   a) calculator; b) arithmometer; c) mechanical integrator

2. When was the first Soviet computer put into operation?
   a) in 1950; b) in 1951; c) in 1952

3. Who headed the serial production of computers in the USSR?
   a) A.Krylov; b) S.Lebedev; c) U. Basilevsky

4. Which machine was the first in the development of the first generation computers?

   a) MESM; b) STRELA; c) M-20

5. When did the production of the third generation computers begin?

   a) late 60s; b) early 70s; c) late 70s

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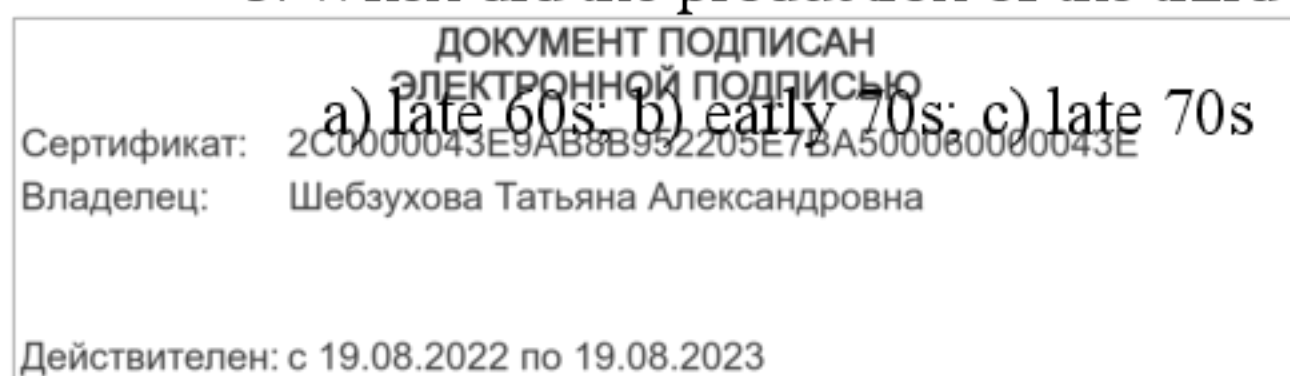
Практическое занятие № 12.

Тема занятия: OutputDevices. Printers/ Устройства вывода информации. Принтеры

</div>

Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.

В результате освоения темы студент должен:

знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;

уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;

владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.

Актуальность темы: обусловлена необходимостью овладения компетенцией УК-4.

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Теоретическаячасть:

Output Devices. Printers

</div>

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

Character printers print only one character at a time. A typewriter is an example of a character printer. Character printers are the type used with literally all microcomputers as well as on computers of all sizes whenever the printing requirements are not large. Character printers may be of several types. *A letter-quality printer* is a character printer which produces output of typewriter quality. Letter-quality printers typically have speeds ranging from 10 to 50 characters per second. *Dot-matrix printers* form each character as a pattern of dots. These printers have a lower quality of type but are generally faster printers than the letter-quality printers — in the range of 50 to 200 characters per second. One of the newest types of character printer is *the ink-jet printer.* It sprays small drops of ink onto paper to form printed characters. The ink has a high iron content, which is affected by magnetic fields of the printer. These magnetic fields cause the ink to take the shape of a character as the ink approaches the paper.

Line printers are electromechanical machines used for high-volume paper output on most computer systems. Their printing speeds are such that to an observer they appear to be printing

a line at a time. They are impact printers. The speeds of line printers vary from 100 to 2500 lines per minute. Line printers have been designed to use many different types of printing mechanisms. Two of the most common print mechanisms are the drum and the chain. *Drum printers* use a solid, cylindrical drum, rotating at a rapid speed. Speeds of dram printers vary from 200 to over 2000 lines per minute. *Chain printers* have their character set on a rapidly rotating chain called a print chain. Speeds of chain printers range from 400 to 2400 lines per minute.

Page printers are high-speed nonimpact printers. Their printing rates are so high that output appears to emerge from the printer a page at a time. A variety of techniques are used in the design of page printers. These techniques, called electrophotographic techniques, have developed from the paper copier technology. *Laser-beam printers* use a combination of laser beam and electrophotographic techniques to create printer output at a rate equal to 18000 lines per minute.

Vocabulary

human-readableform — удобнаядлячтенияформа

performance [pə'fɔməns] — (рабочая) характеристика; производительность; быстродействие; скорость работы; пропускная способность

character printer — принтер с посимвольной печатью; символьный принтер

line printer ['lain]— принтер с построчной печатью

page printer ['peidʒ] — принтер с постраничной печатью

(non) impact printer ['nɔnimpəkt] — (бес)контактный принтер

letter-quality printer — принтер с типографским качеством печати

dot-matrix printer ['dɔt 'meitriks] — точечно-матричный принтер

ink-jet printer ['iŋk 'dʒet] — струйный принтер

laser-beam printer ['leizə 'bi:m] — лазерныйпринтер

to identify [ai'dentifai] — идентифицировать; распознать; обозначить

approach [əp'routʃ] — подход; метод; принцип; приближение

at a time — за один раз; одновременно

to cause ['kɔ:z] — вызывать; приводить к (ч.-л.); заставлять; вынуждать

to strike against a ribbon — ударятьполенте

typewriter ['taipraitə] — печатное устройство

to spray drops of ink — распылятькапличернил

to affect [ə'fekt] — влиять; воздействовать; сказываться на (ч.-л.)

technique [tek'nik] — метод; способ; техника; методика; технология

printer output — вывод на печать; распечатываемые данные

Вопросы и задания:

1. Ответьте на вопросы, используя информацию текста.

1. What are the three types of printers? 2. What is a letter-quality printer? 3. What is a dot-matrix printer? 4. What type of printer is the most common with microcomputer systems? 5. What is the most common printer type used on large computer systems? 6. What is an impact printer? Give an example. 7. What is a nonimpact printer? Give examples. 8. What are the most widely used printers? 9. How do you distinguish between a letter-quality printer and a dot-matrix printer? 10. Which of these printers is slower? 11. What types of character printers do you know? 12. How are printed characters formed by means of an ink-jet printer? 13. What are the main types of a line printer? Which of them is faster? 14. What techniques are used in the operation of page printers?

2. Найдите в тексте английские эквиваленты следующихсловосочетаний:

Удобная для восприятия человека форма; наиболее часто употребляемые устройства вывода информации; различаться по рабочим характеристикам и внешнему виду; принтеры с посимвольной печатью; принтеры с построчной печатью; принтеры с постраничной печатью; различные методы печати; диапазон скорости; принтеры контактные и бесконтактные; ударять по ленте; печатать по одному символу; буквально все компьютеры; а также; требования печати; принтер с типографским качеством печати; точечно-матричные принтеры; струйные принтеры; разбрызгивать капли чернил; высокое содержание железа; магнитные поля; принимать форму символа; кажется, что печатают по строчке; барабанный принтер; цепочечные принтеры; лазерный принтер.

3. Вспомните значение новых слов и попытайтесь перевести словосочетания с этими словами.

Approach: comprehensive approach; database approach; educational (training) approach; general approach; graphic approach; self-study approach; step-by-step approach; trial-and-error approach.

Performance: application performance; computer performance; device performance; disk performance; display performance; error performance; execution performance; memory performance; network performance; processor performance.

Printer: black-and-white printer; color printer; character (at-a-time) printer; dot-matrix printer; graphical (image) printer; impact printer; ink jet printer; laser printer; letter-quality printer; matrix printer; network printer; page (at-a-time) printer.

Technique: advanced technique; analog technique; computing technique; display (video) technique; formatting technique; hardware technique; measuring technique; modeling (simulation) technique; multimedia technique; numerical technique; programming technique; scanning technique; software technique; testing technique.

4. Переведите предложения, содержащие инфинитивныйоборот NominativewiththeInfinitive (сложное подлежащее).

1. *Printers* are known *to vary* greatly in performance and design. 2. *They* are expected *to be* the most commonly used devices. 3. *Magnetic fields* are supposed *to effect* a high iron content of the ink. 4. *The ink-jet printer* is stated *to be* one of the newest types of character printers. 5. *Electrophotographic techniques* proved *to have developed* from the paper copier technology. 6. *An impact printer* is considered *to produce* a printed character by impacting a character font against the paper. 7. *Dot-matrix printers* seem *to have* a lower quality of type. 8. *The most common printer type used on larger systems is sure *to be* the line printer. 9. *A lot of techniques* are believed *to be used* in the design of printers. 10.*A laser* is certain *to be* an acronym for light amplification by stimulated emission of radiation.

5. Прочтите текст и составьте письменно реферат на английском языке.

Magnetic Media Devices

Some of the devices mentioned above can perform both the input and output functions. Magnetic disc, magnetic diskette, and magnetic tape are examples of such devices. Magnetic discs, diskettes, and tapes can record data as output from primary storage and can also serve as input devices returning the data to primary storage.

Data are recorded on magnetic discs and magnetic tapes either by outputting the data from primary storage or by using a data recorder. Data recorders are not input devices, and they are not connected to the computer system. Instead they are offline recorders. The magnetic media recording devices are key-to-disk, key-to-diskette, and key-to-tape machines.

Key-to-disk devices are used as data recording stations in multistation shared-processor systems. They are able to correct data before storing it on a magnetic disk and before its entry into the main computer system.

Key-to-diskette systems store data on flexible discs, called diskettes. Diskettes are inexpensive and reusable.

Key-to-tape devices can record data on reels, on cassettes, and on tape cartridges. The magnetic tape reels produced by key-to-tape systems are in a computer-compatible format for subsequent direct data input into a computer. However, data on cartridges and cassettes often are transferred to higher-speed media, such as a full-sized reel of magnetic tape or magnetic disc, for data transfer to the computer.

**6. Выполните перевод следующего текста письменно по вариантам.**

Keyboard Devices

1. There is a wide variety of keyboard devices, or terminals, available for use in entering data directly into a computer.

The visual display terminal (VDT) is the most popular type of I/O device in use today. It consists of a typewriterlike keyboard for inputting and a cathode ray tube (CRT) for displaying output data. Each character entered through the keyboard is also displayed on the CRT. When keyed the data are held in a small memory, called a buffer, within the terminal itself. The data are not sent on to the computer until the operator presses an enter key on the keyboard. This allows the operator the opportunity to proofread or verify the data being entered by reading the data displayed on the screen. There are three major uses of VDT's: alphanumeric displays, graphic displays, and input through a light pen.

Alphanumeric displays. The most common use of the visual display terminal is to display alphanumeric data, that is, character data. Because of their relatively fast output rates and their ability to provide a viewer with an "instant" output, video displays have replaced printers for many applications.

Graphic displays. Visual display terminals with a graphic display capability provide a very powerful and versatile tool for many users. Graphic-display devices provide not only a means of displaying high-resolution drawings but also the capability of manipulating and modifying the graphic display. The businessperson can use the graphic display to present data in the form of line charts, bar charts, or pie charts. Graphic displays can be very effective in information systems for business manager.
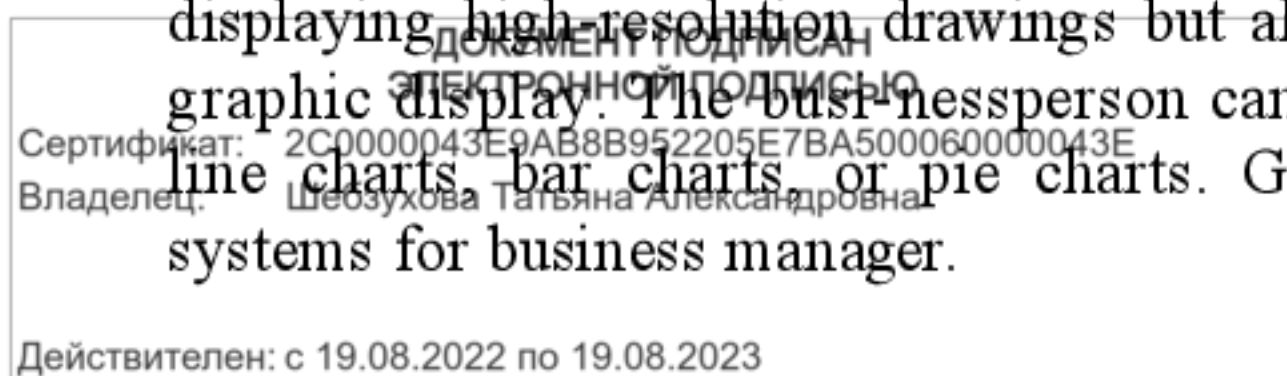
2. Different types of keyboard devices, such as visual display terminals, teleprinter terminals, and point-of-sale devices are among the keyboard devices.

A light pen is a photosensitive penlike instrument which can sense a position on the cathode ray tube (CRT) when the end of the pen is held against the screen. The light pen is an input device. By sensing the position on the screen when you touch it by the light pen, you are inputting data to the main storage. The light pen is commonly used by engineers to modify designs.

Teleprinter terminals. There are situations where it is desirable to have a printed copy of data outputted to a terminal. If a user finds a printed copy to be required, the solution could be a teleprinter terminal. A teleprinter terminal has a keyboard for input and a typewriterlike printer for output. These printers are character printers and are therefore slower output devices than CRT displays.

A point-of-sale (POS) device is the electronic equivalent of a cash register, however it is capable of capturing more data than a cash register. Most point-of-sale devices are online terminals attached to a computer for processing the transaction while the customer is making the purchase. The significant features of most of the current electronic POS devices include: the capability of entering extensive information about the sale, the guiding of the operator through the possible transactions by a series of lighted indicators or messages, a provision for transmission of the data to a central computer, and the provision for a local computational capability such as price extensions and tax calculations.

Практическое занятие № 13.

Тема занятия: PersonalComputers/ Персональные компьютеры

Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.

В результате освоения темы студент должен:

знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;

уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;

владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.

Актуальность темы: обусловлена необходимостью овладения компетенцией УК-4.

Теоретическаячасть:

Personal Computers

Personal computers are supposed to appear in the late 1970s. One of the first and most popular personal computers was theApple II, introduced in 1977 by Apple Computer. During the late 1970s and early 1980s, new models and competitive operating systems seemed to appear daily. Then, in 1981, IBM entered the fray with its first personal computer, known as the IBM PC. The IBM PC quickly became the personal computer of choice, and most other personal computer manufacturers fell by the way-side. One of the few companies to survive IBM's onslaught was Apple Computer, which is sure to remain a major player in the personal computer marketplace. In less than a decade the microcomputer has been transformed from a calculator and hobbyist's toy into a personal computer for almost everyone.

What is a personal computer? How can this device be characterized?

— First, a personal computer being microprocessor-based, its central processing unit, called a microprocessor unit, or MPU, is concentrated on a single silicon chip.
— Second, a PC has a memory and word size that are smaller than those of minicomputers and large computers. Typical word sizes are 8 or 16 bits, and main memories range in size from 16 K to 512 K.
— Third, a personal computer uses smaller, less expensive, and less powerful input, output and storage components than do large computer systems. Most often, input is by means of a keyboard, soft-copy output being displayed on a cathode-ray tube screen. Hard-copy output is produced on a low-speed character printer.
— A PC employs floppy disks as the principal online and offline storage devices and also as input and output media.
— Finally, a PC is a general-purpose, stand-alone system that can begin to work when plugged in and be moved from place to place.

Probably the most distinguishing feature of a personal computer is that it is used by an individual, usually in an interactive mode. Regardless of the purpose for which it is used, either for leisure activities in the home or for business applications in the office, we can consider it to be a personal computer.

Vocabulary

personal computers — персональныекомпьютеры

competitive operating systems — конкурирующаяоперационнаясистема

IBM (International Business Machine) — фирмапопроизводствукомпьютеров

to enter the fray — ввязатьсявдраку

computerofchoice — лучшийкомпьютер

to fall by the wayside — остаться в стороне; уступить дорогу

to survive onslaught [sə'vaiv 'ɔnslɔt] — выдержать конкуренцию

word size — размер слова; разрядность двоичного слова

soft-copy output — вывод электронной, программно-управляемой копии

hard-copy output — вывод «твердой» печатной копии online storage — неавтономное хранение данных в ЗУ

offline storage — автономное хранение данных отдельно от компьютера

input media — носитель для входных данных

output media — носитель для выходных данных

general -purpose — универсальный; общего назначения

stand-alone — автономный

to plug in — plug in — включать; подключать; подсоединять

leisure activities [leʒə 'æk'tivitiz] — досуговая деятельность

Вопросы и задания:

1. Ответьте на вопросы, используя информацию текста.

1. When did the first personal computer appear? 2. What was one of the first PC model? 3. What is a personal computer? 4. What are the four main characteristics of a PC? 5. What does the term "microprocessor-based" mean? 6. What are the typical word sizes of a PC? 7. How is input carried out in personal computers? 8. What principle storage devices do PC use? 9. What kind of a system is a PC? 10. What differs personal computers from large computer systems?

2. Найдите в тексте английские эквиваленты следующих словосочетаний:

Конкурирующая операционная система; появляться ежедневно; ввязаться в драку; лучший компьютер; остаться в стороне; выдержать конкуренцию; главный поставщик на компьютерном рынке; игрушка для любителя; микропроцессорный; цельный кристалл (микросхема) из кремния; размер слова; компоненты меньшей мощности; посредством; вывести на экран; низкоскоростной принтер с посимвольной печатью; использовать гибкие диски; приборы (не) автономного хранения данных; универсальный; автономная система; отличительная черта; интерактивный режим; независимо от цели; досуговая деятельность.

3. Проведите грамматический анализ текста, найдите в нем инфинитивные и причастные конструкции. Переведите предложения.

4. Переведите сложные предложения:

А) бессоюзные; **В)** с сочинительной связью. Запомните следующие сочинительные союзы: *and, but, or, while, both ... and, as well as, not only... but also, either... or, neither... nor.*

A) 1. The computer you told me about was constructed at a Russian plant. 2 We hope we'll buy the computer your friend spoke so much about 3. This is the principle the electronic computer is based upon. 4. The teacher says we may ask any questions we like. 5. Elements integrated circuits are made of are electrically interconnected components. 6. The main tendencies of 1C development scientists are working at are to increase the scale of integration and to improve reliability. 7. — Where are the computer games I gave you yesterday? — The computer games you are asking about are on the top shelf. 8. He was one of the greatest scientists the world had ever known.

B) 1. These devices can perform *both* the input *and* output functions. 2. Data are recorded on magnetic discs and tapes *either* by outputting the data from primary storage *or* by using a data recorder. 3. *Neither*-the programmer *nor* the analyst could explain the cause of the computer errors. 4. Data *as well as* instructions must flow into and out of primary storage. 5. This grammar exercise is *not only* too long *but also* very difficult. 6. Printers may be *either* impact or nonimpact. 7. Character printers are used with all microcomputers *as well as* on computers of all sizes. 8. *Both* primary *and* secondary storage contain data and the instructions for processing the data. 9. The CPU functional units can be in one of two states: *either* "on" or "off". 10. High-speed devices are *both* input *and* output devices that are used as secondary storage.

5. Прочтите текст и укажите сферы деятельности, где используются персональные компьютеры.

Application of Personal Computers

Personal computers have a lot of applications, however, there are some major categories of applications: home and hobby, word processing, professional, educational, small business and engineering and scientific.

Home and hobby. Personal computers enjoy great popularity among experimenters and hobbyists. They are an exciting hobby. All hobbyists need not be engineers or programmers. There are many games that use the full capabilities of a computer to provide many hours of exciting leisure-time adventure.

The list of other home and hobby applications of PCs is almost endless, including: checking account management, budgeting, personal finance, planning, investment analyses, telephone answering and dialing, home security, home environment and climate control, appliance control, calendar management, maintenance of address and mailing lists and what not.

Word processing. At home or at work, applications software, called a word processing program, enables you to correct or modify any document in any manner you wish before printing it. Using the CRT monitor as a display screen, you are able to view what you have typed to correct mistakes in spelling or grammar, add or delete sentences, move paragraphs around, and replace words. The letter or document can be stored on a diskette for future use.

Professional. The category of professional includes persons making extensive use of word processing, whose occupations are particularly suited to the desk-top use of PCs. Examples of other occupations are accountants, financial advisors, stock brokers,

tax consultants, lawyers, architects, engineers, educators and all levels of managers. Applications programs that are popular with persons in these occupations include accounting, income tax preparation, statistical analysis, graphics, stock market forecasting and computer modeling. The electronic worksheet is, by far, the computer modeling program most widely used by professionals. It can be used for scheduling, planning, and the examination of "what if situations.

Educational. Personal computers are having and will continue to have a profound influence upon the classroom, affecting both the learner and the teacher. Microcomputers are making their way into classrooms to an ever-increasing extent, giving impetus to the design of programmed learning materials that can meet the demands of student and teacher.

Two important types of uses for personal computers in education are computer-managed instruction (CMI), and computer-assisted instruction (CAI). CMI software is used to assist the instructor in the management of all classroom-related activities, such as record keeping, work assignments, testing, and grading. Applications of CAI include mathematics, reading, typing, computer literacy, programming languages, and simulations of real-world situations.

Vocabulary

word processing — обработкатекста

telephone dialing ['teləfoun 'daiəliŋ] — наборномерателефона
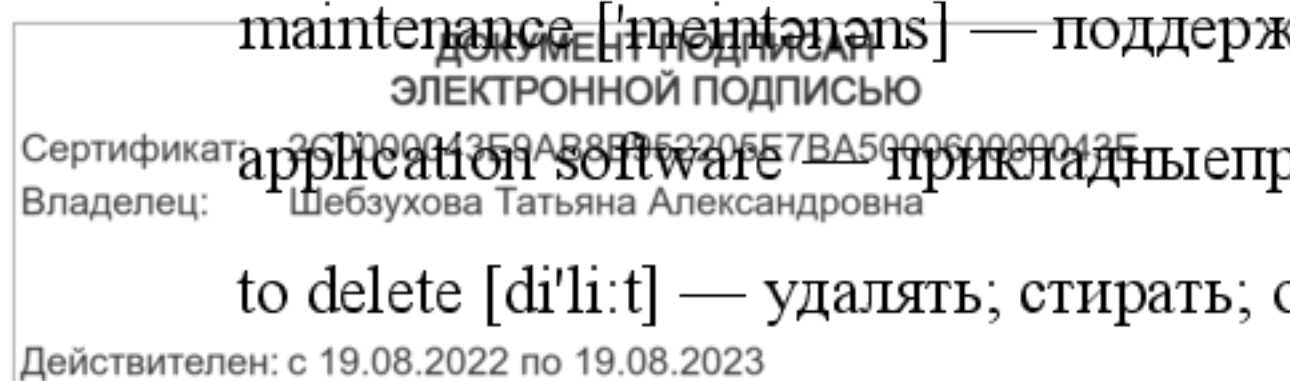
security [sə'kjuəriti] — безопасность; охрана

appliance [əp'laiəns] — устройство; прибор

maintenance ['meintənəns] — поддержание; сохранение; эксплуатация

application software — прикладныепрограммы

to delete [di'li:t] — удалять; стирать; очищать память

to move paragraphs around — менятьместамиабзацы

accountant [ə'kauntənt] — бухгалтер

accounting [ə'kauntiŋ] — бухгалтерскийучет

incometax ['inkʌm 'tæks] — подоходныйналог

stock market forecasting — биржевые прогнозы

worksheet ['wə:kʃi:t] — электронная таблица

scheduling ['ʃedjuliŋ]— составление расписания, графика

computer-assisted instructions — компьютерные команды

to meet the demands — удовлетворять потребности

record keeping — регистрация; ведение записей

grading ['greidiŋ] — оценивание; классификация

6. Ответьте на вопросы, используя информацию текста.

1. What are the main spheres of PC application? 2. Do you enjoy computer games? 3. Is it necessary for a person to be an analyst or a programmer to play computer games? 4. What other home and hobby applications, except computer games, can you name? 5. What is "a word processing program"? 6. What possibilities can it give you? 7. Can you correct mistakes while typing any material and how? 8. What other changes in the typed text can you make using a display? 9. Which professions are in great need of computers? 10. How can computers be used in education?

7. Найдите в тексте английские эквиваленты следующихсловосочетаний:

Много областей применения; тем не менее; обработка текстов; пользоваться популярностью; любители; способности компьютера; бесконечный перечень; анализ инвестиций; набор номера телефона; автоответчик; ведение календаря; хранение адресов и почты; и так далее; прикладные программы; исправлять ошибки в написании; стирать предложения; переставлять абзацы; бухгалтер; биржевые брокеры; консультант по налогам; юристы; работники образования; управленцы; бухгалтерский учет; подоходный налог; компьютерное моделирование; электронные таблицы; составление расписания; оказывать огромное влияние; прокладывать путь; дать толчок; удовлетворять потребности; учебная деятельность; компьютерная грамотность; моделирование реально-жизненных ситуаций.

8. Найдите в текстах слова:

а) близкие по значению следующим словам:

Verbs: to print; to produce; to convert; to keep; to found; to erase; to name; to change; to use; to start; to switch on; to supply; to give possibility; to involve.

Nouns: rate; analyst; possibilities; use; plays; control; post; mode; profession; consultant; teacher; director; book-keeper; fight; producer; attack; amateur; device; crystal; error; storage; primary (memory); monitor; characteristic; aim.

Adjectives: flexible; thrilling; main; little; general;

b) противоположные по значению следующим словам:

Verbs: to finish; to switch on; to take; to delete.

Nouns; online; input; work.

Adjectives: cheep; weak; common; general; large; soft; high; easy.

9. Расшифруйте следующие аббревиатуры и переведите их.

PC; PU; CU; ALU; CPU; MPU; IBM; DOS; CRT; ROM; RAM; 1C; SSI; MSI; LSI; VLSI; MP; CD; I/O; IOP; CMI; CAI.

10. Переведите безличные предложения. Обратите внимание на их специфику.

1. It is well known that personal computers enjoy great popularity among experimenters and hobbyists. 2. It took years to produce a high-speed computer performing a lot of functions. 3. When making up the summary of the text *one* should put down the exact title of the article, the author's name and the date of the edition. 4. *It* is difficult to imagine modern life without a computer. 5. *It* is quite impossible to listen to your English pronunciation: you make bad mistakes while reading. 6. Concerning these substances *one* must say that they vary in their composition. 7. When working with these substances *one* should be very careful. 8. It was once a universal practice to manifacture each of the components separately and then assemble the complete device by wiring (монтаж) the components together with metallic conductors. 9. *It* was no good: the more components and interactions, the less reliable the system. 10. It should first be made clear what the term "microelectronics" means.

11. Вспомните формы причастий, проанализируйте и переведите следующие предложения:

Participle	Active	Passive
Present	*using*	*being used*
Past	-	*used*
Perfect	*having used*	*Having been used*

1. The results *obtained* are of particular importance for our research. 2. *Having obtained* the *required* results we informed the manager of this fact. 3. The necessary data *having been obtained,* we could continue our experiment. 4. *Being obtained* the results of the research were analysed. 5. While *operating* with graphical interface people usually use such manipulators as a mouse and a track ball. 6. Key-to-disk devices *used* as data *recording* stations can correct data before storing it on a magnetic disk. 7. D.Mendeleyev *having arranged* the elements in a table, the existence of yet unknown elements could be predicted. 8. All the necessary preparations *having been done,* the operator began assembling the machine. 9. *Being built* on the basis of transistors lasers are successfully used in technology.

12. Переведите сложноподчиненные предложения. Запомните союзы (союзные слова), вводящие придаточные предложения: *that; so that; if, whether;* which; when; while; since; *till;* **until; whatever; whenever; in order** to; regardless of, etc.

1. It is well known in computer science *that* the words "computer" and "processor' are used interchangeably. 2. The operation part of the instruction is decoded *so that* the proper arithmetic and logic operation can be performed. 3. It is difficult to establish *whether* this problem can be solved at all. 4. Programs and data on *which* the control unit and the arithmetic-logical unit operate must be in internal memory *in order to* be processed. 5. The CU has a register *that* temporarily holds the instructions read from memory *while* it is being executed. 6. *Regardless of the nature of the* I/O devices, I/O interfaces are required to convert the input data to the

internal codes used by the computer and to convert internal codes to a format *which* is usable by the output devices. 7. The purpose of registers in the ALU is to hold the numbers and the results of the calculation *until* they can be transferred to the memory. 8. *Since* the computer deals with pulses, the input device is a way of converting numbers written on paper into pulses and sending them to the storage. 9. The principal characteristics of personal computers are that they are single-user system and are based on microprocessors. 10. However, although personal computers are designed as single-user systems, it is common to link them together to form a network.

Раздел 4. ComputerProgramming/ Компьютерное программирование

Практическое занятие № 14.

Тема занятия: WhatisProgramming? / Что такое программирование?

Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.
В результате освоения темы студент должен:
знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;
уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;
владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.
**Актуальность темы:** обусловлена необходимостью овладения компетенцией УК-4.

Теоретическаячасть:

What is Programming?

Programming is the process of preparing a set of coded instructions which enables the computer to solve specific problems or to perform specific functions. Theessence of computer programmingis the encoding of the program for the computer by means of algorythms. The thing is that any problem is expressed in mathematical terms, it contains formulae, equations and calculations^ But the computer cannot manipulate formulae, equations and calculations. Any problem must be specially processed for the computer to understand it, that is — coded or programmed.

The phase in which the system's computer programs are written is called the development phase. The programs are lists of instructions that will be followed by the control unit of the central processing unit (CPU). The instructions of the program must be complete and in the appropriate sequence, or else the wrong answers will result. To guard against these errors in logic and to document the program's logical approach, logic plans should be developed.

There are two common techniques for planning the logic of a program. The first technique is flowcharting. A flowchart is a plan in the form of a graphic or pictorial representation that uses predefined symbols to illustrate the program logic. It is, therefore, a "picture" of the logical steps to be performed by the computer. Each of the predefined symbol shapes stands for a general operation. The symbol shape communicates the nature of the general operation, and the specifics are written within the symbol. A plastic or metal guide called a template is used to make drawing the symbols easier.
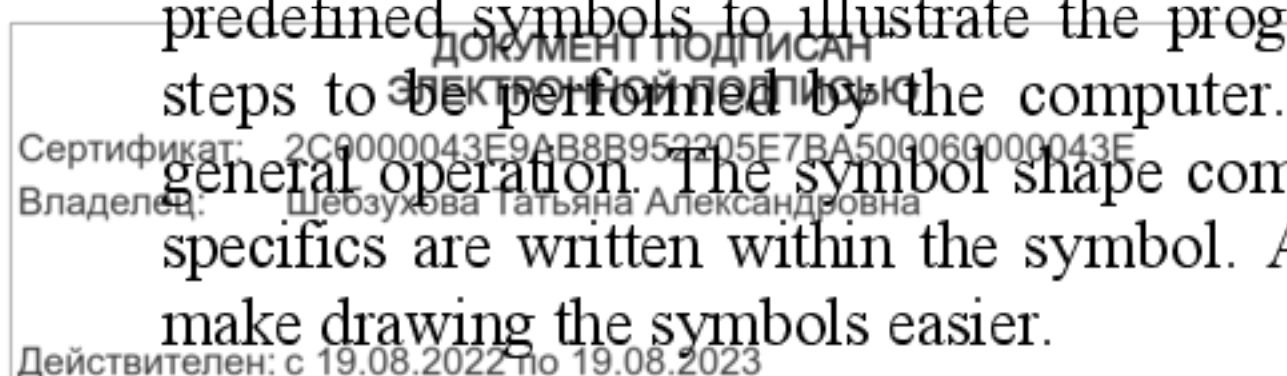
The second technique for planning program logic is called pseudocode. Pseudocode is an imitation of actual program instructions. It allows a program-like structure without the burden of programming rules to follow. Pseudocode is less time-consuming for the professional programmer than is flowcharting. It also emphasizes a top-down approach to program structure.

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

Vocabulary

equation [i'kweiʃən] — уравнение, приравнивание

list of instructions — переченькоманд

guard ['ga:d] — защищать; предохранять; завершать; заканчивать

appropriate sequence [ə'prɔpriit 'sikwəns] — необходимая (требуемая) последовательность

program logic — логическая последовательность выполнения программы

flowchart ['floutʃa:t] — блок-схема; составлять блок-схему

flowcharting — построение блок-схемы pictorial representation — наглядное представление

predefined symbols [pridi'faind 'simbəlz] — заранеезаданныесимволы

specifics [spə'sifiks] — специальные черты; характерные особенности

emplate [im'pleit] — шаблон; маска; образец; эталон

pseudocode ['psju:doukoud] — псевдокод; псевдопрограмма

burden ['bə:dən]— издержки, затраты

programming rules — правила программирования

consume [kən'sju:m] — потреблять; расходовать

emphasize ['emfəsaiz] — выделять; подчеркивать

top-down approach — принцип нисходящей разработки

looping logic — логическая схема выполнения (операций) в цикле

Вопросы и задания:

1. Просмотрите текст еще раз и ответьте на вопросы, используя информацию текста.

1. What is programming? 2. What is the essence of programming? 3. What should be done with the problem before processing by the computer? 4. What is a program? 5. What are instructions? 6. What are the main techniques for planning the program logic? 7. What is a flowchart? 8. What is a template and what is it used for? 9. What do you understand by "pseudocode"? 10. What are the basic structures of pseudocode?

2. Найдите в тексте английские эквиваленты следующихсловосочетаний:

Совокупность закодированныхкоманд; суть компьютерного программирования; кодирование посредством алгоритма; формулы, уравнения, вычисления; обработать особым
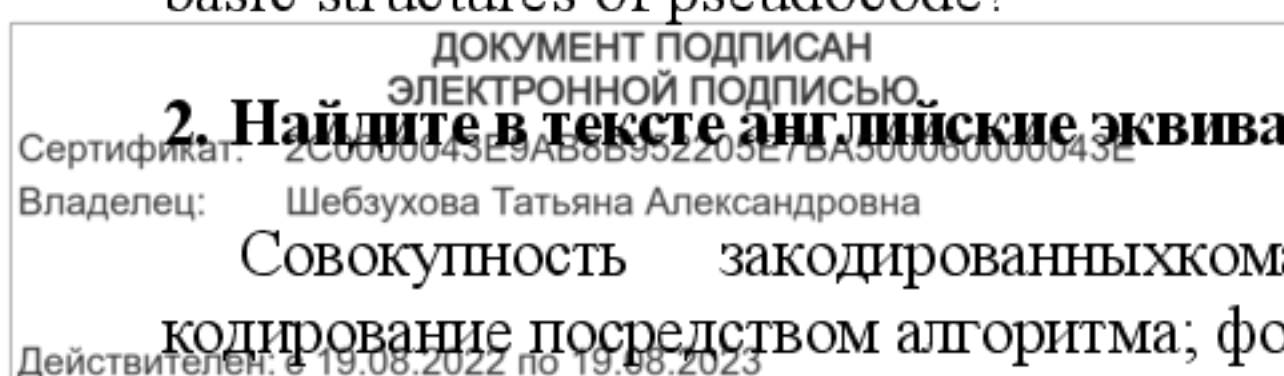
образом; перечень команд; необходимая последовательность; защищать от ошибок; составлять план логической последовательности; общепринятая методика; логическая последовательность выполнения программы; построение блок-схемы; наглядное представление; заранее заданные символы; шаблон; псевдопрограмма; без издержек; выделять принцип нисходящей обработки; расходовать меньше времени; логическая схема выполнения операций в цикле; необходимая последовательность операций.

3. **Подберите из предложенных ниже русских словосочетаний значения следующих терминов на английскомязьые:**

Program: access program; application program; archived program; binary program; common program; compatible / incompatible program; control / management program; database program; debugging program; educational / teaching / training program; free program; general-purpose program; high-performance program; off-line program; on-line program; operating (-system) program; processing program; protected-mode program; remote program; running program; self-loading program; simulation program; support program; utility program; virus-detection program; watch-dog program.

Программа в двоичном коде; прикладная программа; (не) совместимая программа; бесплатная программа; программа отладки; сторожевая программа; дистанционная программа; программа моделирования; сервисная программа; вспомогательная программа; программа для доступа (к данным); заархивированная программа; программа, работающая с базой данных; обучающая программа; программа, выполняемая с большой скоростью; универсальная программа; программа, выполняемая в защищенном режиме; программа обработки данных; программа операционной системы (системная программа); выполняемая программа; сетевая /несетевая программа; самоза-гружающаяся программа; часто используемая (распространенная) программа; программа управления; программа обнаружения вирусов.

4. **Переведите предложения, содержащие сослагательноенаклонение.**

1. Ishould like to be a top specialist in computer technology. 2. It is necessary that the program should be debugged (отлажена) by a programmer. 3. It is required that the programmer should code the instructions of the program in the appropriate sequence. 4. The manager demanded that the work should be performed in time. 5. Write down the algorythm of computer operations lest you should make errors. 6. Our teacher speaks English as if he were a real Englishman. 7. Without the Sun there would be no light, no heat, no energy of any kind. 8.1 wish it were summer now and we could go to the seaside. 9. American scientists suggested that the quantum generator should be called *laser,* which is the acronym for fight amplification by stimulated emission of radiation. 10.1 wished you had mentioned these facts while the subject was being discussed.

5. **Выполните письменный перевод текста по вариантам.**

Digital Computer Operation

1. A digital computer is a machine capable of performing operations on data represented in digital or number form. The individual operations performed by a digital computer are very simple arithmetic or logical processes involving the manipulation of the bits in words or characters of information. The great power of any digital computer rests in the ability to store large volumes of data and to perform these operations at extremely high speed.

In most electronic digital computers the method of number representation is based on the system of binary notation. The binary notation system is most widely used because of the convenience in constructing logical circuits and storage devices capable of handling data in this form.

For example, a magnetic memory unit consists of many thousand individual magnetic cells, each of which can be energized in either of two ways to represent the binary digits 0 or 1. If these cells are grouped to form words or binary coded characters, information can be stored for processing in units of specified size. In the same way, digital data can be recorded as a series of magnetized spots on a magnetic tape or a magnetic disk.

2. The computer has pervaded most fields of human activity and is the most important innovation of our age. Born out of the technology of communication, it is capable of handling enormous amounts of information at tremendous speeds. What makes it so potent is the fact that a single mechanism can perform any information-processing task. The same mechanism can control industrial processes, guide space vehicles or help to teach children. This diversity of tasks is made possible by the simple idea of the stored program.

A program is the enumeration of determining commands. It specifies the method used for the solution of a problem in detail. When the machine is. in operation, both the commands and the numbers to be processed are constantly being taken out of and put into a depository of information known as a memory.

It can be seen that the processes performed by a digital computer are essentially simple. These operations can be performed at extremely high speeds and with a high degree of coordination between the different functional units of the hardware system, and this ability means that digital computers can undertake highly complex tasks.

6. **Прочтите внимательно текст. Составьте на английском языке план текста, выделив основные его темы. План можно составить в вопросной, назывной или тезисной форме. Познакомьтесь с образцами планов, представленными после текста; сравните со своим планом.**

Memory

It is interesting to note that memory, one of the basic components of the computer, is often called storage. It stores calculation program, the calculation formulae, initial data, intermediate and final results. Therefore, the functions of the computer memory may be classified in the following way. Firstly, the computer memory must store the information transmitted from the input and other devices. Secondly, memory should produce the information needed for the computation process to all other devices of the computer.

Generally, memory consists of two main parts called the main, primary or internal, memory and the secondary, or external memory. The advantage of the primary memory is an extremely high speed. The secondary memory has a comparatively low speed, but it is capable of storing far greater amount of information than the main memory. The primary storage takes a direct part in the computational process. The secondary storage provides the information necessary for a single step in the sequence of computation steps.

The most important performance characteristics of a storage unit are speed, capacity and reliability. Its speed is measured in cycle time. Its capacity is measured by the number of machine words or binary digits. Its reliability is measured by the number of failures (отказ) per unit of time.

План в вопросной форме.

1. What is memory?
2. What is the function of memory?
3. What are the main parts of memory?
4. What are advantages and disadvantages of a storage unit?

5. What are their functions?
6. What are performance characteristics of the main and secondary memory?
7. What units are performance characteristics measured by?

План в назывной форме

1. The definition of memory.
2. The main functions of memory.
3. Classification of memory.
4. Advantages and disadvantages of memory components.
5. The functions of memory components.
6. Performance characteristics of memory.
7. The units for measuring the performance characteristics of memory.

План в тезисной форме.

1. Memory is one of the basic components of the computer.
2. Memory stores initial data, intermediate and final results.
3. It produces the information needed to other devices of the computer.

4. Memory consists of the main (internal) and the secondary (external) storage.
5. The main memory has high speed, but small capacity; the secondary memory possesses lower speed but greater capacity.
6. The main memory performs computation; the secondary memory provides information sequentially, step by step.
7. The performance characteristics — speed, capacity and reliability — are measured by cycles, binary digits and the number of failures per unit of time.

Практическое занятие № 15.

Тема занятия: ProgrammingLanguages/ Языки программирования

Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.
В результате освоения темы студент должен:
знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;
уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;
владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.
Актуальность темы: обусловлена необходимостью овладения компетенцией УК-4.

Теоретическаячасть:

Programming Languages

Let's assume that we have studied the problem, designed a logical plan (our flowchart or pseudocode), and are now ready to write the program instructions. The process of writing program instructions is called coding. The instructions will be written on a form called a coding form. The instructions we write will be recorded in a machine-readable form using a keypunch, key-to-tape, or key-to-disk, or entered directly into computer memory through a terminal keyboard.

The computer cannot understand instructions written in just any old way. The instructions must be written according to a set of rules. These rules are the foundation of a programming language. A programming language must convey the logical steps of the program plan in such a way that the control unit of the CPU can interpret and follow the instructions. Programminglanguages have improved throughout the years, just as computer hardware has improved. They have progressed from machine-oriented languages that use strings of binary Is and 0s to problem-oriented languages that use common mathematical and/or English terms.

There are over 200 problem-oriented languages. The most common of them are COBOL, FORTRAN, PL/I, RPG, BASIC, PASCAL.

COBOL

COBOL was the most widely used business-oriented programming language. Its name is an acronym for Common Jlisi-ncss-Oriented Zanguage. COBOL was designed to solve problems that are oriented toward data handling and input-output operations. Of course, COBOL can perform arithmetic operations as well, but its greatest flexibility is in data handling. COBOL also was designed as a self-documenting language. Self-documenting languages are those that do not require a great deal of explanation in order to be understood by someone reading the program instructions. The self-documenting aspect of COBOL is made possible by its sentencelike structure and the very generous maximum symbolic field-name length of 30 characters. With a field-name length of up to 30 characters, the name can clearly identify the field and its purpose.

FORTRAN IV

The FORTRAN **IV** language is oriented toward solving problems of a mathematical nature. The name FORTRAN comes from the combination of the words *formula translation*. The version of FORTRAN IV has been designed as algebra-based programming language. Any formula or those mathematical relationships that can be expressed algebraically can easily be expressed as a FORTRAN instruction. FORTRAN is the most commonly used language for scientific applications.

PL/I

PL/I stands for programming language I. It was designed as a general-purpose language incorporating features similar to COBOL for data handling instructions and features similar to FORTRAN for mathematical instructions. PL/I is much more than a combination of the good features of both COBOL and FORTRAN, as it has many capabilities that are unique. Yet, although PL/I is one of the most versatile and the most powerful of the programming languages, it is not the most commonly used. COBOL and FORTRAN have been available for a longer period of time than PL/I, and many more users work with those languages.
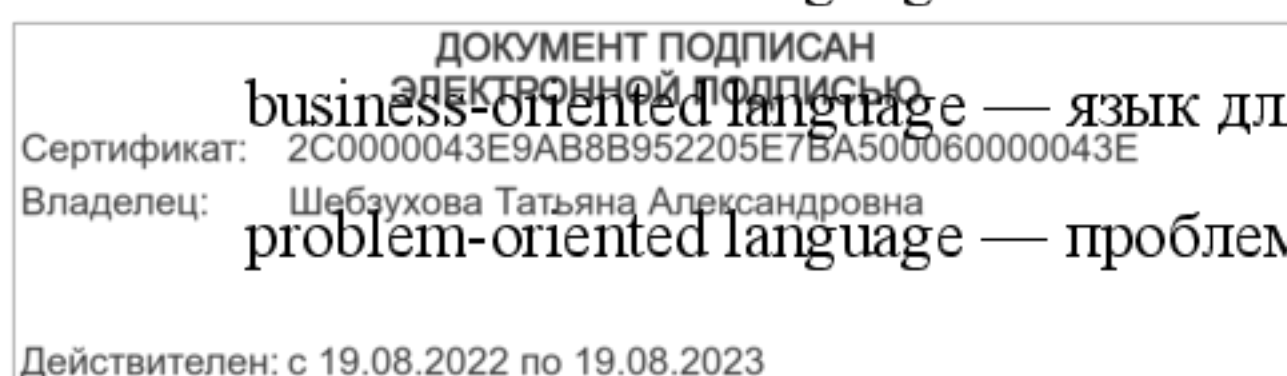
Vocabulary

programminglanguage — языкпрограммирования

codedform — кодированныйвид; кодированноепредставление

toimprove — улучшать, совершенствовать

machine-orientedlanguage — машинно-ориентированныйязык

business-oriented language — язык для (программирования) экономических задач

problem-oriented language — проблемно-ориентированный язык

string of binary — строка двоичного представления

data handling — обработка данных; работа с данными

field-name length — длина имени поля

incorporate features — включать свойства, особенности

versatile — многофункциональный; разносторонний; универсальный

generous — большой, значительный (о количестве)

mathematical relationship — математическая связь (соотношение)

Вопросы и задания:

1. Просмотрите текст еще раз и ответьте на вопросы, используя информацию текста.

1. What is the process of writing instructions called? 2. What is a code? 3. How must instructions be written? 4. What is the foundation of any programming language? 5. How was the development of programming languages progressing throughout the years? 6. What are the most common problem-oriented languages? 7. What is COBOL? 8. What functions was COBOL designed for? 9. What does FORTRAN serve for? 10. Whatcapabilitieshas PL/I?

2. Найдите в тексте английские эквиваленты следующихсловосочетаний:

Языки программирования; блок-схема; кодированная форма; вид, удобочитаемый для компьютера; в соответствии с набором правил; представить логические шаги программы; таким образом; совершенствовать языки программирования; машинно-ориентированные языки; проблемно-ориентированные языки; обычный термин; язык для программирования экономических задач; обработка информации; операции по вводу-выводу данных; гибкость; идентифицировать поле и его цели; решение проблем математического характера; сферы научного применения; универсальный язык; включать свойства; уникальные возможности; многофункциональный и самый мощный из языков программирования.

3. Переведите условные сложноподчиненные предложения. Обратите внимание на форму выражения разныхтипов условия.

I. 1. If you try very hard you can master any language. 2. Ifyou want to master any language you must know at least threethousand words. 3. You **will** improve your pronunciation if youread aloud every day. 4. Time will be saved if one uses a computer. 5. If you learn all the words of the lesson you will writeyour test successfully. 6. If you or I add up two numbers of sixfigures without a calculator, it will take us a lot of time.

II. 1. It would be a good thing if you didn't smoke. 2. If theearth didn't rotate it wouldn't have the shape of a ball. 3. If Ihad the time I should help you to solve the problem. But I mustbe off. 4.1 should translate the article without difficulty if I knewEnglish well. 5. If I were in your place I should learn to speakEnglish fluently. 6. Were you asked to explain why addition isperformed the way it is, you would probably have to think for awhile before answering.

III. 1. I decided to stay at home last night. I would have gone out if I hadn't been so tired. 2. Had he not been busy, he wouldn't have missed that conference. 3. Why didn't you phone me yesterday? I would have helped you. 4. If you had attended preliminary courses, you would have passed you examinations more successfully. 5. Had the manager had this information before,

he would have acted differently. 6. The binary system is particulary appropriate to the nature of an electric machine; if it had not existed, computer designers would have had to invent it.

4. Выполните перевод следующих текстов письменно повариантам.

1. RPG II Programming language

RPG **II** is a business-oriented language. The name stands for report program generator. RPG is considerably different from other programming languages. RPG is, in effect, a large prewritten program. The programmer simply indicates the options within the master program that are to be used and, through a set of indicators, when they are to be used.

RPG was originally referred to as a "quick-and-dirty" programming language. That is, it is quick for the programmer to write and relatively inefficient in its use of main storage and processing speed. The latest version of RPG, called RPG II, greatly improved the language and gave it additional capabilities. RPG has an advantage over COBOL in that it requires less training for a programmer to become proficient in it. For this reason, RPG is commonly used on many smaller computers and in small business.

2. BASIC

BASIC is the acronym for beginner's all-purpose symbolic instruction code. It was developed in Dartmouth College as an easy-to-learn programming language for students and inexperienced programmers. Its key design goal is simplicity. BASIC has become a very popular language in systems where many users share the use of a computer through terminals and it has become a universal language for personal computers.

The language BASIC is mathematically oriented, that is, its typical use is to solve problems of a mathematical nature. Because BASIC programs are usually executed from a terminal or microcomputer where input is entered through a keyboard and printed output is relatively slow, problems of a business nature requiring large volumes of input-output data are usually not practical.

3. PASCAL

PASCAL was invented in 1970 by Professor Niklaus Wirth of Zurich, Switzerland. It was named after the mathematician Blaise Pascal, who invented one of the earliest practical calculators. PASCAL is a mathematically oriented programming language and, as such, is most commonly used in mathematics, engineering, and computer science departments of colleges and universities. This language is somewhat unusual in that it was designed to be a structured language. This means that the program must be written in logical modules which are in turn called by a main controlling module. Much of PASCAL'S popularity is due to work done at the University of California at San Diego, where PASCAL has been implemented on several different computers including microcomputers.

5. Прочтите тексты (по вариантам) и составьте рефераты на английском языке.

1. The conversion of symbolic languages

As we see, most of the symbolic languages are oriented toward the particular application areas of business or science (math). The one problem with all symbolic languages is that none of them can be understood by a computer. The symbolic languages may say AP, **ADD,** or use a "plus" sign to indicate an addition step, but the only thing that means addition to a computer is its binary machine code. We have symbolic programs that are relatively easy for humans to understand, but they cannot be understood by computers. On the other hand, we have machine code that is understood by the computer, but it is difficult for humans to use. The solution is a
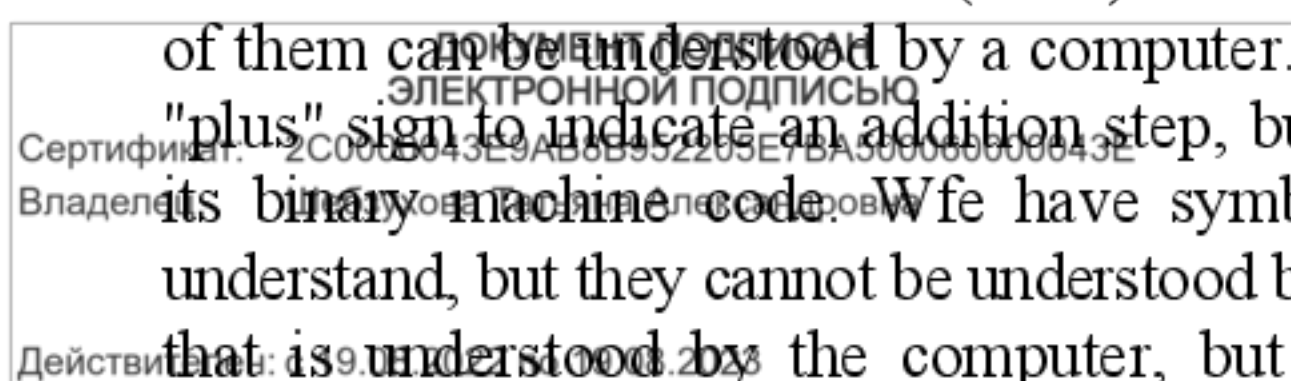
translator that translates the symbolic program into machine code. The translator allows the human to work with relatively easy-to-understand symbolic languages and it allows the computer to follow instructions in machine code. The translation of symbolic instructions to machine code is accomplished through the use of a program called a *language processor*. There are three types of language processors. They are called assemblers, compilers, and interpreters. Each translates symbolic instructions to machine code, but each does it differently.

(The translator is a program itself. It is part of a group of programs, called the operating systems, that help us to use the computer.)

2. Running the computer program

The operating system is a collection of program provided by the computer's manufacturer that allows us to shedule jobs for the computer, to translate source programs into object programs, to sort data stored on secondary storage devices, and to copy data from any input device to any output device. These programs are called control programs, language programs and utility programs.

The control program (often called the supervisor, monitor, or executive) is a main-storage-resident program. Its functions are to schedule jobs, shedule input and output for our programs, and to monitor the execution of our programs.

The language processors are programs that translate source programs into object programs. There are three types of language processors: assemblers, compilers, and interpreters. Each language has its own language processor.

The service programs are programs that are commonly used in all data processing centers. They have functions that are required by everyone using a computer. Examples of service programs include linkage editors to prepare object programs for execution, a librarian to catalog programs into a library area on magnetic disc, utility programs to transfer data from device to device, and sort-merge programs for sorting data on magnetic tape or disk.

3. Testing the computer program

There are two kinds of errors or bugs with which programmers must deal. The first type is the coding error. Such errors are syntax errors that prevent the language processor from successfully translating the source program to object program code. The language processor identifies the nature and the location of the error on the source program listing, so these errors are relatively easy to find and correct. The second type of bug is the logic error. The computer program can be successfully translated, but the program does not produce the desired results. These errors are generally much more difficult to find and to correct than are coding errors. Logic errors can be avoided through careful planning of the program logic, but it is the programmer's responsibility to test thoroughly all of the program's functions, in order to verify that the program performs according to specifications.

There are many tools provided to the programmer to help in debugging the program logic. These tools are called debug packages or tracing routines. They assist the programmer in following the logic by printing out calculation results and field values used in making logic decisions in the program. In a few cases it may be necessary to use a memory dump — a printout of the instructions and date held in the computer's memory — in order to find the cause of logic

Цель: формирование у студентов коммуникативной компетенции для осуществления профессиональной коммуникации.
В результате освоения темы студент должен:
знать: лексику профессиональной направленности; нормы употребления лексики английского языка в профессиональной сфере; особенности грамматики профессионального английского языка;
уметь: осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке; читать и переводить специальную литературу для пополнения профессиональных знаний;
владеть: навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.
Актуальность темы: обусловлена необходимостью овладения компетенцией УК-4.

Теоретическаячасть:

The World-Wide Web

People have dreamt of a universal information database since late nineteen forties. In this database, not only would the data be accessible to people around the world, but it would also easily link to other pieces of information, so that only the most important data would be quickly found by a user. Only recently the new technologies have made such systems possible. The most popular system currently in use is the World-Wide Web (WWW) which began in March 1989. The Web is an Internet-based computer network that allows users on one computer to access information stored on another through the world-wide network.

As the popularity of the Internet increases, people become more aware of its colossal potential. The World-Wide Web is a product of the continuous search for innovative ways of sharing information resources. The WWW project is based on the principle of universal readership; "if information is available, then any person should be able to access it from anywhere in the world." The Web's implementation follows a standard *client-server* model. In this model, a user relies on a program (the client) to connect to a remote machine (the server), where the data is stored. The architecture of the WWW is the one of clients, such as Netscape, Mosaic, or Lynx, "which know how to *present* data but not what its origin is, and servers, which know how to *extract* data", but are ignorant of how it will be presented to the user.

One of the main features of the WWW documents is their *hypertext* structure. On a graphic terminal, for instance, a particular reference can be represented by underlined text, or an icon. "The user clicks on it with the mouse, and the referenced document appears." This method makes copying of information unnecessary: data needs only to be stored once, and all referenced to it can be linked to the original document.

Вопросы и задания:

1. **Прочтите тексты (по вариантам) и составьте короткую аннотацию на каждый из них.**

A. Success of the WWW

Set off in 1989, the WWW quickly gained great popularity among Internet users. What is the reason for the immense success of the World-Wide Web? Perhaps, it can be explained by CERN's* attitude towards the development of the project. As soon as the basic outline of the WWW was complete, CERN made the source code for its software publicly available. CERN has

been encouraging collaboration by academic and commercial parties since the onset of the project, and by doing so it got millions of people involved in the growth of the Web.

The system requirements for running a WWW server are minimal, so even administrators with limited funds had a chance to become information providers. Because of the intuitive nature of hypertext, many inexperienced computer users were able to connect to the network. Furthermore, the simplicity of the Hyper Text Markup Language, used for creating interactive documents, allowed these users to contribute to the expanding database of documents on the Web. Also, the nature of the World-Wide Web provided a way to interconnect computers running different operating systems, and display information created in a variety of existing media formats.

In short, the possibilities for hypertext in the world-wide environment are endless. With the computer industry growing at today's pace, no one knows what awaits us in the 21st century.

Note _____

  * CERN was originally named after its founding body the 'Conseil Europeen pour la Recherche Nucleaire,' and is now called 'European Laboratory for Particle Physics*'.

B. A Brief History of the Internet

In 1973 the Defense Advanced Research Projects Agency (DARPA) initiated a research program to investigate techniques and technologies for interlinking packet networks of various kinds. The objective was to develop communication protocols which would allow networked computers to communicate transparently across multiple, linked packet networks. This was called the Internetting project and the system of networks which emerged from the research was known as the "Internet" (Intercontinental Network).

During the course of its evolution, particularly after 1989, the Internet system began to intergrate support for other protocol suites into its basic networking fabric. By the end of 1991 the Internet has grown to include some 5000 networks in over three dozen countries, serving over 700,000 host computers used by over 4,000,000 people.

The bulk of the system today is made up of private networking facilities In education and research institutions, business and in government organizations across the globe.

A secretariat has been created to manage the day-to-day function of the Internet Activities Board (IAB) and Internet Engineering Task Force (IETF). IETF meets three times a year in plenary and in approximately 50 working groups convene at intermediate times by electronic mail, teleconferencing and at face-to-face meetings.

There are a number of Network Information Centres (NICs) located throughout the Internet to serve its users with documentation, guidance, advice and assistance. As the Internet continues to grow internationally, the need for high quality NIC functions increases. Although the initial community of users of the Internet were drawn from the ranks of computer science and engineering its users now comprise a wide range of disciplines in the sciences, arts, letters, business, military and government administration.

2. Итоговый тест. Подберите вместо пропусков подходящее по смыслу слово.

1. The most common _____ for planning the program logicare flowcharting and pseudocode.

a) technologies; b) technics; c) techniques
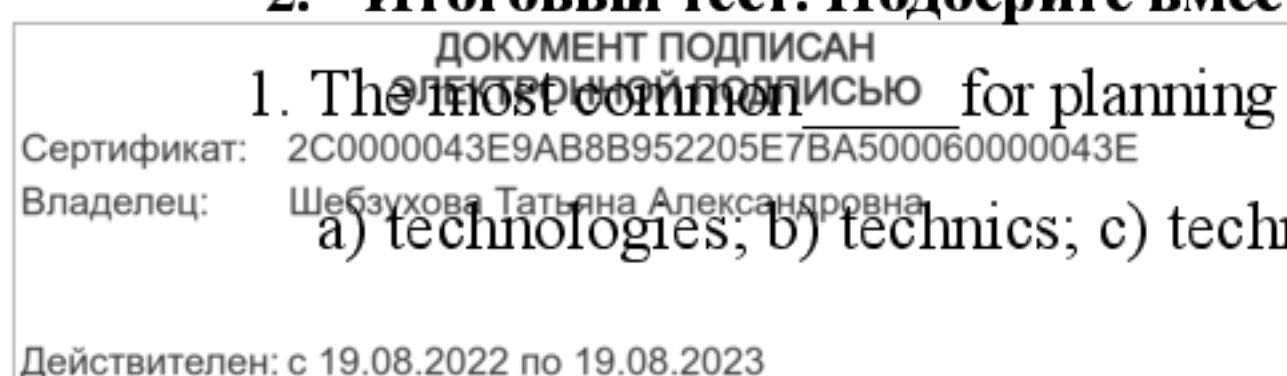
2._____was designed for dealing with the complicatedmathematical calculations of scientists and engineers,

a) COBOL; b) FORTRAN; c) PL/I

3._____is the foundation of any programming languages.

a) a set of rules; b) a group of numbers; c) a lot of instructions

4. I / O_____match the physical and electrical characteristics of input-output devices.

a) interchanges; b) interfaces; c) interpretations

5. Letter-quality, dot-matrix and ink-jet printers are all_____printers.

a) line; b) page; c) character

6. The most common device used to transfer informationfrom the user to the computer is the_____.

a) keyboard; b) printer; c) modem

7. Input-output units link the computer to its external_____.

a) requirement; b) development; c) environment

8. I / O devices can be classified according to their speed, visual displays being_____devices.

a) high-speed; b)medium-speed; c) low-speed

2. Согласуйте слова в левой колонке с их интерпретацией, предложенной справа.

1. Computer   a) an electronic device accepting data processing results from the computer system;

2. Input   b) the unit performing arithmetic operations called for in the instructions;

3. Output   c) the unit coordinating all the activities of various components of the computer. It reads information, enterpretes instructions, performs operations, etc.;

4. Software   d) a set of programs designed to control the operation of a computer;

5. Hardware   e) lists of instructions followed by the control unit of the CPU:

6. Storage   f) an electronic device keying information into the computer;

7. CPU   g) the unit holding all data to be processed, intermediate and final results of processing;

8. CU   h) visible units, physical components of a data processing system;

9. ALU   i) the unit that directs the sequence of system operations, selects instructions and interpretes them;

10. Program   j) a device with a complex network of electronic circuits that can process information, make decisions, and replace people in routine tasks.

3. Определите неличные формы глагола, содержащиеся в следующих предложениях. Переведитеих.
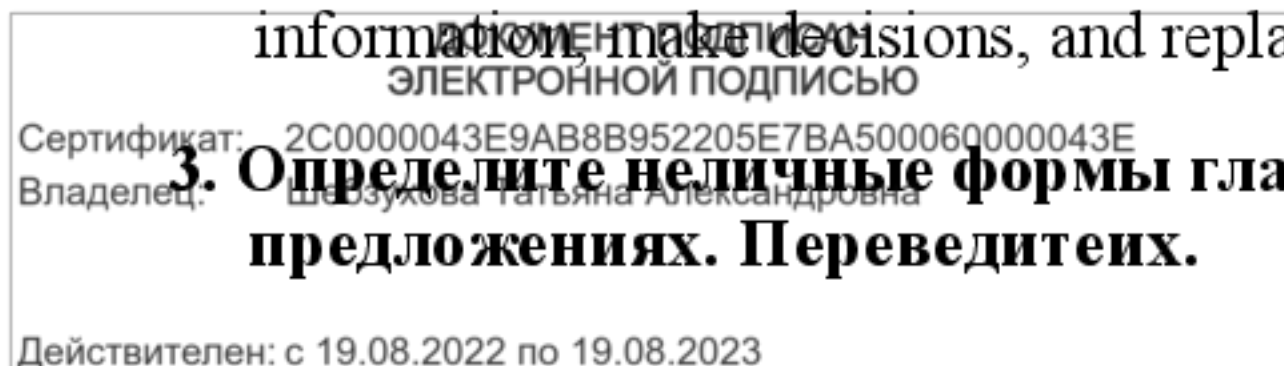
1. The problems to be studied are of great importance. 2. The problem studied helped us understand many things. 3. To study the problem we must make some experiments. 4. To study the problem means to give answers to many questions. 5. Having studied the problem we could answer many questions. 6. The problem studied is unlikely to be of great interest. 7. Scientists studying the problem made a lot of experiments to get answers to the required questions. 8. The problem to have been studied last year will not help us to solve our task now. 9. Having been well prepared for the examination the pupils could answer all the questions the teacher asked them. 10. The problem to be discussed at the meeting requires careful consideration.

4. Выполните перевод грамматикализованных предложений.

I. 1. Accuracy is one of the major items in judging a control system. The higher the accuracy of the system, the less errors the system makes. 2. The digital computer employs the principle of counting units, digits, and hence, if properly guided, gives answers which have a high degree of accuracy. 3. Electronic computers can choose which of several different operations are the right ones to make in given circumstances. Never before has mankind had such a powerful tool available. 4. In many cases man has proved to be but an imperfect controller of the machines he has created. Thus, it is natural, that wherever necessary, we should try to replace the human controller by some form of automatic controller. 5. It is necessary to draw a distinction between calculating machines and computers, the former requiring manual control for each arithmetic step and the latter having the power to solve a complete problem automatically.

II. 1. Many servomechanisms and regulators are known to be composed of a number of control elements connected in series, the output of one being used as the input to the next. 2. We expect a computer to work for at least several hours without a fault; that is to say, supposing a speed of one thousand operations per second, to perform more than ten million operations. 3. Digital programming implies the preparation of a problem for a digital computer by putting it in a form which the computer can understand and then entering this program into the computer storage unit. A problem to be solved by a digital computer must be expressed in mathematical terms that the computer can work with. 4. Among all forms of magnetic storage, magnetic tapes were the first to be proposed in connection with digital computers. 5. Programming a computer involves analyzing the problem to be solved and a plan to solve it.

ENJOY YOURSELF

Quiz-game "Do you know more about computers"? *(Divide into two groups and give answers to even (1 gr.) and odd (2 gr.) question numbers.)*

1. What are the main functional units of a digital computer?
2. What types of storage do you know?
3. What is a binary number system?
4. What is storage media?
5. How is storage capacity measured (in what units)?
6. What do you know of electronic memories?
7. What can you say about electromechanical memories?
8. How do you understand the term "access time"?
9. What is RAM/ROM?
10. What storage devices do you know?
11. What is the function of the CPU?
12. What two functional units does the CPU consist of?
13. What components does control unit include?
14. What devices has the arithmetic-logical unit?
15. What is the ALU function?
16. What is the function of CU?
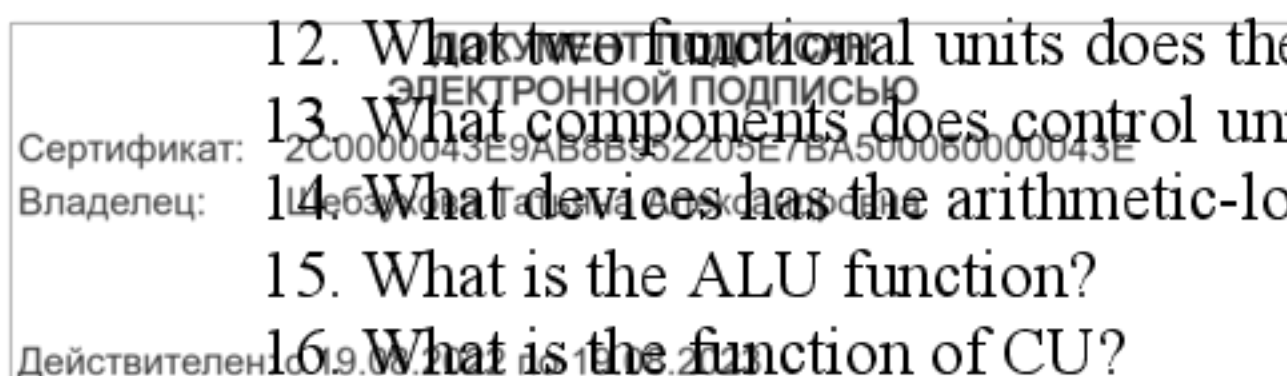
17. What is the heart (brain) of a microprocessor?

18. What is the purpose of input devices?

19. How do you understand the term "input-output environment"?

20. What groups can I/O devices be classified according to their speed?

21. Name devices used for inputting information.

22. What is touch pad?

23. What is a scanner used for?

24. What types of printers do you know?

25. When did the first personal computer appear?

26. What differs PC from large computer systems?

27. What is a personal computer?

28. What are the main spheres of PC applications?

29. What professions are in great need of computers?

30. What is modem and what is it used for?

31. What is programming?

32. What is a program?

33. What techniques for planning the program logic do you know?

34. What do you understand by pseudocode?

35. What is a code?

36. What is the foundation of any programming language?

37. What programming languages do you know?

38. What is FORTRAN used for? Decode it.

39. What does COBOL serve for? Decode it.

40. What is WWW?

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МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ
РОССИЙСКОЙ ФЕДЕРАЦИИ
Федеральное государственное автономное
образовательное учреждение высшего образования
«СЕВЕРО-КАВКАЗСКИЙ ФЕДЕРАЛЬНЫЙ УНИВЕРСИТЕТ»
Пятигорский институт (филиал) СКФУ

Методические рекомендации
по организации и проведению самостоятельной работы обучающихся
по дисциплине
«ИНОСТРАННЫЙ ЯЗЫК В СФЕРЕ ПРОФЕССИОНАЛЬНОЙ КОММУНИКАЦИИ»
для студентов направления подготовки
10.03.01 Информационная безопасность

СОДЕРЖАНИЕ

ВВЕДЕНИЕ

Основной целью самостоятельной работы студентов является повышение исходного уровня владения иностранным языком, достигнутого на предыдущей ступени образования, и овладение студентами необходимыми достаточным уровнем коммуникативной компетенции для решения задач межличностного и межкультурного взаимодействия. Изучение иностранного языка призвано также обеспечить:
- повышение уровня учебной автономии и способности к самообразованию;
- развитие когнитивных и исследовательских умений;
- развитие информационной культуры;
- расширение кругозора и повышение общей культуры студентов.

Самостоятельная работа студентов занимает важное место в учебной научно-исследовательской деятельности студентов. Без самостоятельной работы невозможно не только овладение любой вузовской дисциплиной, но и формирование специалиста как профессионала. В широком смысле под самостоятельной работой следует понимать совокупность всей самостоятельной деятельности студентов, как в учебной аудитории, так и в нее, в контакте с преподавателем и в его отсутствие.

Усиление роли самостоятельной работы студентов означает принципиальный пересмотр организации учебно-воспитательного процесса в вузе, который должен строиться так, чтобы развивать умение учиться, формировать у студента способности к саморазвитию, творческому применению полученных знаний, способам адаптации к профессиональной деятельности в современном мире.

1. ОБЩАЯ ХАРАКТЕРИСТИКА САМОСТОЯТЕЛЬНОЙ РАБОТЫ ОБУЧАЮЩЕГОСЯ ПРИ ИЗУЧЕНИИ ДИСЦИПЛИНЫ «ИНОСТРАННЫЙ ЯЗЫК В СФЕРЕ ПРОФЕССИОНАЛЬНОЙ КОММУНИКАЦИИ»

Под самостоятельной работой студентов (СРС) понимается совокупность всей самостоятельной деятельности студентов, как в учебной аудитории, так и за ее пределами, в контакте с преподавателем и в его отсутствие.

Цель самостоятельной работы студента – научиться осмысленно и самостоятельно работать с учебным материалом и научной информацией, овладеть фундаментальными знаниями, умениями и навыками в сферах академической, профессиональной и социально-гуманитарной деятельности, сформировать основы самоорганизации и самовоспитания с тем, чтобы привить умение в дальнейшем непрерывно повышать свою профессиональную квалификацию.

Задачами СРС являются:
− систематизация и закрепление полученных теоретических знаний и практических умений;
− углубление и расширение теоретических знаний;
− формирование умений использовать учебно-справочную литературу;
− развитие познавательных способностей и активности студентов: творческой инициативы, самостоятельности, ответственности и организованности;
−формирование самостоятельности мышления, способностей к саморазвитию, самосовершенствованию и самореализации;
− развитие исследовательских умений;
− использование материала, собранного и полученного в ходе самостоятельных занятий на практических занятиях, для эффективной подготовки к зачетам и экзаменам.

Основными видами самостоятельной работы студентов являются:
 - *самостоятельное изучение литературы;*
Цель: самостоятельно детально изучить темы, представленные в рабочей программе.
Задачи: приобретение навыка работы с источниками и литературой; умения грамотно составлять конспекты и пользоваться ими; выявлять различные точки зрения на проблему и степень ее разработанности в литературе.
 - *подготовка к практическим занятиям* (выполнение домашних заданий) и к собеседованию по индивидуальным заданиям;
Цель: углубление знания учебного материала.
Задачи: освоить отдельные вопросы в рамках изучаемой дисциплины; грамотность, последовательность и рациональность изложения подготовленного материала во время практического занятия.
-составление глоссария по тексту.
Цель: составить базу новых лексических единиц.
Задачи:
• самостоятельная поэтапная отработка учебных элементов;
• развитие практических умений;
• формирование умений использовать информационные источники: справочную и специальную литературу.

Приступая к **самостоятельному изучению литературы** по учебной дисциплине «Иностранный язык в сфере профессиональной коммуникации», необходимо: ознакомиться с рабочей программой; взять в библиотеке рекомендованные учебники и учебные пособия; получить у ведущего преподавателя в электронном виде методические рекомендации к практическим и самостоятельным работам; завести новую тетрадь для конспектирования теоретического материала и выполнения практических заданий.

Для изучения дисциплины предлагается список основной и дополнительной литературы. Основная литература предназначена для обязательного изучения, дополнительная – поможет более глубоко освоить отдельные вопросы в рамках изучаемой дисциплины.

В ходе **подготовки к практическим занятиям** студент обязан осуществлять конспектирование учебного материала, особое внимание, обращая на теорию, формулировки, раскрывающие содержание тех или иных грамматических и языковых понятий. В рабочих конспектах желательно оставлять поля, на которых следует делать пометки, дополнять материал, формулировать выводы и практические рекомендации.

Самостоятельная работа студентов над материалом учебной дисциплины является неотъемлемой частью учебного процесса и должна предполагать углубление знания учебного материала, излагаемого на аудиторных занятиях, и приобретение дополнительных знаний по отдельным вопросам самостоятельно.

Конспект темы – письменный текст, в котором кратко и последовательно изложено содержание основного источника информации. Конспектировать — значит приводить к некоему порядку сведения, почерпнутые из оригинала. В основе процесса лежит систематизация прочитанного или услышанного. Записи могут делаться как в виде точных выдержек, цитат, так и в форме свободной подачи смысла.

Индивидуальные задания призваны расширить кругозор студентов, углубить их знания и развить умения исследовательской деятельности, проявить элементы творчества.

Собеседование – средство контроля, организованное как специальная беседа преподавателя со студентом на темы, связанные с изучаемой дисциплиной, и рассчитанное на выяснение объема знаний обучающегося по определенному разделу, теме, проблеме и т.п.

Глоссарий - словарь, который помогает осваивать новые лексические единицы по теме. В глоссарий необходимо добавлять специальную терминологию, аббревиатуры и сокращения, фразеологические единицы и пр.

Каждый вид самостоятельной работы имеет определенные формы отчетности.

В ходе выполнения самостоятельной работы студент должен продемонстрировать сформированность компетенции:

Код	Формулировка:
УК-4	способность к осуществлению деловой коммуникации в устной и письменной формах на государственном языке Российской Федерации и иностранном(ых) языке(ах)

2. ПЛАН-ГРАФИК ВЫПОЛНЕНИЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ

Коды реализуемых компетенций, индикатора (ов)	Вид деятельности студентов	Средства и технологии оценки	Объем часов, в том числе		
			СРС	Контактная работа с преподавателем	Всего
3 семестр					
УК-4(ИД-1 ИД-2 ИД-3)	Самостоятельное изучение литературы по темам 1-16	Собеседование	10,95	1,55	12,5
УК-4(ИД-1 ИД-2 ИД-3)	Подготовка к практическим занятиям по темам 2-16	Индивидуальные творческие задания	4,05	0,45	4,5
УК-4(ИД-1 ИД-2 ИД-3)	Составление глоссария по тексту	Собеседование	9	1	10
Итого за 3 семестр			**24**	**3**	**27**
Итого			**24**	**3**	**27**

3. КОНТРОЛЬНЫЕ ТОЧКИ И ВИДЫ ОТЧЕТНОСТИ ПО НИМ

В рамках рейтинговой системы успеваемость обучающихся по каждой дисциплине оценивается в ходе текущего контроля и промежуточной аттестации.

Текущий контроль
Рейтинговая оценка знаний студента

№ п/п	Вид деятельности студентов	Сроки выполнения	Количество баллов
	2 семестр		
1	Собеседование по темам 1-5	5 неделя	15
2	Собеседование по темам 6-10	10 неделя	15
3	Индивидуальное задание по темам 1-16	14 неделя	25
	Итого за 2 семестр		**55**

4. МЕТОДИЧЕСКИЕ РЕКОМЕНДАЦИИ ПО ИЗУЧЕНИЮ ТЕОРЕТИЧЕСКОГО МАТЕРИАЛА

Изучение любого раздела следует начинать с ознакомления с вопросами плана изучения темы. При изучении теоретического материала необходимо использовать рекомендуемую основную и дополнительную литературу для лучшего усвоения материала.

Осваивать теорию следует в соответствии с той последовательностью, которая представлена в плане самостоятельных и практических занятий.

Для успешного освоения дисциплины, необходимо самостоятельно детально изучить представленные темы по рекомендуемым источникам информации:

№ п/п	Виды самостоятельной работы	Рекомендуемые источники информации (№ источника)			
		Основная	Дополнительная	Методическая	Интернет-ресурсы
1	Самостоятельное изучение литературы по темам: 1-16	1-3	1-2	1-2	1-6
2	Подготовка к практическоим занятиям по темам: 2-16	1-3	1-2	1- 2	1-6
3	Составление глоссария по тексту	1-3	1-2	1-2	1-6

Методика работы с литературой предусматривает ведение записи прочитанного в виде плана-конспекта, опорного конспекта и т.д. Это позволит сделать знания системными, зафиксировать и закрепить их в памяти.

Конспект – сложный способ изложения содержания книги или статьи в логической последовательности. Конспект аккумулирует в себе предыдущие виды записи, позволяет всесторонне охватить содержание книги, статьи, текста, грамматического материала. Поэтому умение составлять план, тезисы, делать выписки и другие записи определяет и технологию составления конспекта.

Методические указания по составлению конспекта
1. Внимательно прочитайте текст. Уточните в справочной литературе или словаре непонятные слова. При записи не забудьте вынести справочные данные на поля конспекта;
2. Выделите главное, составьте план;
3. Кратко сформулируйте основные положения текста;
4. Законспектируйте материал, четко следуя пунктам плана. При конспектировании старайтесь выразить мысль своими словами. Записи следует вести четко, ясно.
5. Грамотно записывайте цитаты. Цитируя, учитывайте лаконичность, значимость мысли.

В тексте конспекта желательно приводить не только тезисные положения, но и их доказательства. При оформлении конспекта необходимо стремиться к емкости каждого предложения. Мысли автора книги следует излагать кратко, заботясь о стиле и выразительности написанного. Для уточнения и дополнения необходимо оставлять поля.

Процедура проверки конспекта включает в себя перечень вопросов базового и повышенного

уровней для собеседования.

Методические рекомендации по представлению и оформлению результатов собеседования

Собеседование представляет собой индивидуальную беседу с каждым студентом по предложенным вопросам с последующей оценкой их подготовки. Целью данной формы занятия является осуществление текущего контроля знаний по теме. В задачи собеседования входит приобретение навыка работы с источниками и литературой; умения грамотно составлять конспекты и пользоваться ими; выявлять различные точки зрения на проблему и степень ее разработанности в литературе.

Собеседование предполагает обязательное конспектирование текста или грамматического материала, а также проработку всей предложенной литературы по теме.

Вопросы для собеседования и критерии оценивания приведены в ФОС данной дисциплины.

5. МЕТОДИЧЕСКИЕ УКАЗАНИЯ ПО ВИДАМ РАБОТ, ПРЕДУСМОТРЕННЫХ РАБОЧЕЙ ПРОГРАММОЙ ДИСЦИПЛИНЫ

5.1. Подготовка к практическим занятиям
Методические указания по подготовке к практическим занятиям.

К самостоятельной работе относится подготовка к практическому занятию и выполнение домашнего задания.

Домашнее задание состоит из индивидуальных заданий, процедура проверки которых включает в себя перечень практических упражнений и вопросов для собеседования.
Итоговый продукт самостоятельной работы: индивидуальное задание.
Средства и технологии оценки: собеседование.

5.2. Методические указания по составлению глоссария по тексту
Подобно любому словарю глоссарий состоит из автономных лексических единиц, расположенных:
- по алфавиту;
- по мере появления терминов в тексте или задании;
- в соответствии с темой изучаемого раздела дисциплины.

Для составления глоссария по заданной теме нужно найти информацию с разных источников (сеть Internet, энциклопедии, практические пособия, учебная литература), изучить ее и составить в рукописном варианте или пользуясь текстовым процессором.

Работа должна быть представлена на бумаге формата А4 в печатном (компьютерном) или рукописном варианте.

Каждая лексическая единица записывается на отдельной строчке. В состав ее характеристики должны входить не только краткое толкование, но и комментарии, примеры, поясняющие цитаты, ссылки на литературу. Главным отличием глоссария от обычных словарей является формирование его в качестве единого комплекса информации в соответствии с исследовательской или практической задачей.

Рекомендации по составлению глоссария:
• **Главное правило глоссария – достоверность.** Пояснение должно наиболее точно отражать суть лексической единицы.
• **Пояснение должно быть корректным и понятным.** Нельзя использовать откровенные жаргонизмы, но и слишком сложный научный текст может только запутать пользователя.
• **Учитывать все варианты.** Если один и тот же термин может иметь несколько равнозначных значений, нужно учитывать все варианты, и на конкретных примерах приводить значение термина в том или ином контексте.
Итоговый продукт самостоятельной работы: словарная статья.
Средства и технологии оценки: собеседование.

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