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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 указания

по выполнению практических работ

по дисциплине «**ИНОСТРАННЫЙ ЯЗЫК В СФЕРЕ ПРОФЕССИОНАЛЬНОЙ  
КОММУНИКАЦИИ**»

для студентов направления подготовки /специальности

**09.03.02 Информационные системы и технологии**

(ЭЛЕКТРОННЫЙ ДОКУМЕНТ)

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## ВВЕДЕНИЕ

Дисциплина «Иностранный язык в профессиональной сфере» ориентирована на:  
развитие навыков чтения, понимания и перевода с английского языка на русский с русского на английский текстов профессиональной направленности;  
развитие навыков устной и письменной коммуникации на английском языке;  
овладение профессиональной лексикой.

Целью освоения дисциплины «Иностранный язык в профессиональной сфере» является формирование у студентов компетенции УК-4 способен осуществлять деловую коммуникацию в устной и письменной формах на государственном языке Российской Федерации и иностранном(ых) языке(ах).

результате освоения дисциплины «Иностранный язык в профессиональной сфере» обучающийся должен:

**Знать:**

- лексику профессиональной направленности;
- нормы употребления лексики английского языка в профессиональной сфере;
- особенности грамматики профессионального английского языка;
- правила оформления презентации, научно-технических отчётов, статей и докладов на научно-технических конференциях на английском языке.

**Уметь:**

- осуществлять профессиональную коммуникацию в устной и письменной формах на английском языке;
- читать и переводить специальную литературу для пополнения профессиональных знаний; -применять навыки говорения, чтения, письма и аудирования на английском языке для решения задач профессиональной направленности.

**Владеть:**

- навыками профессионального общения на английском языке;
- способами пополнения профессиональных знаний из оригинальных источников на английском языке; -терминологией, позволяющей вести профессиональную коммуникацию на английском языке.

## СОДЕРЖАНИЕ ПРАКТИЧЕСКИХ ЗАНЯТИЙ

### РАЗДЕЛ 1: WORKIN IT/ РАБОТА В СФЕРЕ ИТ

#### Практическое занятие № 1. The Profession of a Programmer/ Профессия программиста

**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 УК-4.

#### Теоретическая часть:

A programmer, or a computer programmer, is a person who writes programs to work on a computer. Computer programs are detailed instructions that computers must follow to do their functions. A programmer can be a specialist in one area of computer programming or a generalist who writes codes for many kinds of programs. Programmers also make, design, and test logical structures for solving problems by a computer. Many technical innovations in programming – modern computing technologies and new languages and programming tools - have changed the role of a programmer and enriched much of the programming work today. British mathematician Ada Lovelace (who was the famous British Poet Lord Byron's daughter) was the first to write a program for a computing machine. The machine was Charles Babbage's Analytical Engine, and Ada wrote and published an algorithm to make the calculations of Bernoulli numbers in October 1842. Unfortunately, her work never ran because Babbage's machine was never finished in her time. The first person to successfully run a program on a computer was a computer scientist Konrad Zuse, who succeeded in it in 1941. The American ENIAC (*Electronic Numerical Integrator and Computer*) programming team, consisting of Kay McNulty, Betty Jennings, Betty Snyder, Marlyn Wescoff, Fran Bilas and Ruth Lichterman were the first regularly working programmers. International Programmers' Day is celebrated annually on the 7th of January. In Russia starting from the year of 2009 a professional annual holiday known as Programmers' Day is celebrated on the 13th of September (the 12th of September in leap years).

#### Вопросы и задания:

##### 1. Переведите:

Groupwork. Reflect on the following quotation. Get ready to discuss the prediction together:

“There is no reason anyone is going to want a computer in their home” (Ken Olson, President of Digital Equipment Corporation, 1977)

Share your point of view on the following questions with the rest of the class

What kind of people should make a career in IT?

What traits of character and qualities should they have?

What skills are demanded to be successful in such a profession?

Why is the profession demanded nowadays and in what spheres?

Why have you chosen the profession of a programmer?

##### Прочитайте:

1. Read and translate the text

Answer the following questions using the information from the text and your own experience:

Who is a programmer?

Who was the first programmer in the history of computing? Prove your opinion.

When is International Programmers' Day celebrated?

Why is Programmers' Day in Russia celebrated on the other date?

**Словарный запас:**

1. Guess the meaning of the following international words:

Program, programmer, detail, instruction, function, specialist, code, design, structure, problem, innovation, technology, mathematician, poet, machine, algorithm;

Logical, technical, international;

To design, to publish, to start.

Give synonyms to the following words: *modern, to design, to test, to finish, success*

Give antonyms to the following words: *unfortunately, to change, to enrich, international, to start*

Explain the meaning of the following words: *generalist, annual, leap year, tool, innovation, team, to succeed, instructions*. Make up your own sentences with these words to speak about the profession of a programmer.

Translate the following sentences:

*Работа программиста – сложная, но интересная, она подходит для нас.*

*Мы выбрали её из многих других профессий и надеемся стать хорошими специалистами.*

*Хотя некоторые люди думают, что в сфере компьютеров уже больше нечего открывать, мы знаем, что наши открытия ещё впереди.*

*Записи и чертежи Чарльза Бэббеджа вдохновили учёных из Британского музея науки на создание машины, придуманной им.*

*Мировое научное сообщество признаёт достижения Ады Лавлейс и считает её первым программистом.*

*Уже в 17 веке были первые попытки создания электронных машин; это, например, счётные машины Лейбница и Паскаля.*

*Считается, что коллегой Конрада Цузе, помогавшим ему с созданием Зед-1 был Гельмут Шрейер.*

**Работа в интернете:**

Surf the net and find information about the advantages of the profession of a programmer and the peculiarities of the programmers' training courses at different universities.

**Group work.** Role play the following situation:

*You are invited to the Opening Doors Day arranged by your faculty for future applicants. Your task is to prepare a presentation for school leavers to persuade them to enter this university.*

**Практическое занятие № 2.**

**Jobs in Computing / Работа в сфере вычислительной техники**

**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 УК-4.

## Теоретическая часть:

### 1. Переведите:

#### My Character Tree Traits



The tree represents a person with his/her skills and personal qualities.

LEAVES: personal qualities and skills

Each student will get this tree. Put your qualities and skills connected with working with the computer in the leaves.

Exchange the trees with each other. Study the trees and make a presentation of each other's qualities and skills

After each presentation the whole group tries to find the appropriate job for each candidate trying to explain their choice.

Here you can find some ideas:

- Having ambition

- Working hard
- Getting on with people
- Being adaptable
- Looking smart
- Having sense of humor
- Being motivating
- Being competent
- Being a good team player
- Having good communication skills
- Having patience and tenacity
- Having logical reasoning
- Having problem solving skills

What computer specialties do you know?

What are the responsibilities of different computer specialists?

### Вопросы задания:

#### Прочитайте:

Have you chosen an appropriate job for yourself?

What responsibilities are you suitable for?

Here you can find some ideas:

o work on the full range of development activities – analysis, design, coding, testing and implementation	Ä □ Ä □	Ä □	Ä □
o perform formal analysis of operational needs	Ä □ Ä □	Ä □	Ä □
o run data-processing equipment (data control and editing)	Ä □ Ä □	Ä □	Ä □
o facilitate systems integration	Ä □ Ä □	Ä □	Ä □
o provide messaging, data storage, networking	Ä □ Ä □	Ä □	Ä □
o develop and maintain web-based applications	Ä □ Ä □	Ä □	Ä □
o possess analytical problem solving skills	Ä □ Ä □	Ä □	Ä □
o handle customer support calls	Ä □ Ä □	Ä □	Ä □
o set up equipment	Ä □ Ä □	Ä □	Ä □
o maintain security of documents and customers	Ä □ Ä □	Ä □	Ä □
o install, configure and maintain software and hardware systems	Ä □ Ä □	Ä □	Ä □
o assess potential risks	Ä □ Ä □	Ä □	Ä □
o conduct trainings to new hires, users and technical teams as needed	Ä □ Ä □	Ä □	Ä □
o analyze system issues and provide resolutions.	Ä □ Ä □	Ä □	Ä □
o recommend process improvements	Ä □ Ä □	Ä □	Ä □
o ensure system reliability, security, integrity and performance	Ä □ Ä □	Ä □	Ä □
o conduct computer diagnostics			

**Прочитайте эти две выдержки из объявлений о работе.**

**Сравните свои идеи. Relief International**

**Web Designer-**

**Developer Summary**

Relief International, a humanitarian non-profit agency with the vision and commitment to save lives and sustaining livelihoods, is currently in search of Web Designer/Developer. This position is based in Los Angeles, California. *Under the supervision* of the Executive Director, the *incumbent* is responsible for developing, organizing, implementing, and maintaining Web services for the company. The incumbent will provide technical support and assist in the implementation and maintenance of company computing systems. The incumbent also provides on-going technical and analytical support to end-users and colleagues.

**Primary Responsibilities**

- Develop and maintain web-based applications utilizing strategic, technical and user-friendly approaches.
- Utilize web and graphics development technologies to produce and implement internet and intranet solutions.
- Communicates and collaborates with staffs to develop recommendations for web-related services.

- Keeping up-to-date on the latest web site, user experience, and production technologies and proven best practices.
- Meticulous testing and troubleshooting* of web pages across multiple browsers, platforms, operating systems.
- Produce and deploy electronic newsletters that include a diverse set of articles; be knowledgeable about common email delivery software, metrics and best practices.
- Consults with managerial and technical personnel to clarify problem intent, identify problems, and suggest changes.

### **Qualifications**

- Equivalent to a bachelor's degree from an accredited institution in computer science or related field.
- Two to four years' experience in web design.
- Knowledge of Content Management Systems, PHP, HTML (hand coding, Dreamweaver and FrontPage), CSS, JavaScript, Flash, and, ActionScript, MySQL/SQL/ XML/ XHTML.



- Facility with all web publishing and common design programs including Quark, InDesign, Photoshop, Illustrator, Acrobat and other design tools.
- Experience developing user interfaces, layouts, branding, flash animations, other digital media to facilitate the distribution of digital information to all stakeholders.
- Knowledge of common email delivery software, metrics and best practices.
- Must possess analytical problem solving skills, and demonstrate the ability to handle projects.

### **Red Mountain Machinery**

#### **Sr. Database Administrator - AZ**

##### ***Job Summary***

All database positions in the company form the sub-department of IT known as «Information Services». The overall task of IS is to oversee all aspects of data entry, create and maintain reports, queries, and provide first-level data analysis to all departments, based on need. IS the primary contact for all aspects of TrakQuip and all Microsoft Access databases?

The position of Senior Database Analyst will *oversee the overall progress* of Information Services. The Senior Database Analyst's primary focus will be working on larger projects that serve the company's strategic needs, and *devising and implementing strategies* for data entry and data consistency. This position will also be ultimately responsible for all work done by Information Services.

##### **Essential Duties and Responsibilities**

Supervising, training, *setting priorities*, and reviewing progress of Junior Database Analyst. As the Junior Database Analyst will report directly to the Senior Database Analyst, it will be important to ensure that the flow of communication between Information Services and the rest of the company is consistent.

Resolving software issues

Setting priority of all projects

Maintaining SQL databases

Overseeing creation of Access databases

Considering data entry strategy and other procedural items

4-year college degree, not necessarily in a related field

4 years *related experience*, not necessarily in a related field or industry

Advanced knowledge of database structure

Proficiency with SQL/T-SQL language, Exp. w/VBA conversion to .net, ASP.net, XML, Documentation, SharePoint & Web parts Development, Source Safe.

Advanced knowledge of MS Access and programming in Visual Basic for Access

##### ***Necessary Knowledge, Skills and Abilities:***

Advanced knowledge of Microsoft Word, Access, Excel

Problem solving skills

Concepts of intermediate math

Ability to handle multiple tasks.

##### ***Просмотрите эти рекламные объявления снова и ответьте на эти вопросы:***

What companies are represented in these advertisements?

What sort of a specialist do they need?

What will their responsibilities be?

Do they need any experience?

### **Словарный запас**

Find English equivalents to the following Russian words. Use them in the sentences of your own describing the responsibilities of these candidates:

Выявление неисправностей

Кандидат на должность  
Тщательное исследование  
Устанавливать очередность  
Осуществлять стратегию  
Под руководством  
Соответствующий опыт работы  
Следить за общим развитием

Match the highlighted words in the texts with their synonyms below. Use them to describe responsibilities of people working on computer.

*cooperate, decide, help, carry out, support, contrive, utilize, manage, have*

**Диалог(работа в парах):** Student 1:

You have read one of the above job advertisements in the newspaper. You are looking forward to getting this job. Pay a visit to that company and ask for more information.

Student 2:

You are working for one of these companies. You are responsible for recruitment of the staff. Talk to St1 and answer his/her questions. You can use information from the advertisements.

**Прочитайте:**

If you want to apply for a job you should present, the information about yourself correctly. You can do this with the help of CV. You will be given an example of CV. What parts does a typical CV consist of?

**Curriculum Vitae**

**Profile**

Self-motivated, responsible and ambitious Skilled organizer and problem solver with the ability to consider options with an open mind before making a decision Determined to achieve results and be successful.

**Education**

2003 – 2006 Computing with Business Management (BSc) at Kingston University. Subjects studied: Operating System Networking, Management Accounting, System Analysis & Design, Accounting in a Business Context, Introductory Data Analysis, Business Modelling and etc.

2000 – 2003 A/S Maths & AVCE Information Communication Technology at Harrow College  
Main modules included: Creating and managing website, Spreadsheet, Networking, Presenting Information, Visual Basic, Graphics and etc.

1998 – 2000 GCSE at Harrow High School 10 GCSE's: Including Maths, English/ English Literature, Humanities, Art, Science, French and Technology.

1999 – 2000 Diploma of Vocational Education in Art and Design.

**Experience**

15.08.06 – 15.08.2007 Ocean Exchange UK Ltd: Data Entry Administrator Main Duties: Administration of inbound and outbound data – Logging, checking and storing. Data Manipulation – Formatting, verifying and preparation of electronic data using MS Excel, MS Access Data Reporting – Delivery of internal reports on database compilation.

12.03.01 to Present Primark Stores Ltd: Sales Advisor Involved in all aspects of customer service, including: answering questions, problem solving and providing assistance to the customers.

21.06.99 - 02.07.99 Nationwide Building Society: Clerical Assistant

Responsibilities were amending records on computer, extracting information from computer and etc.

**Computer skills**

Highly proficient in using the following software packages: Microsoft Word, Excel, Access, Front.

**Nationality:** British

**Marital Status:** Single

**Referees:**

Professor Jones, Kingston University, Penrhyn Road, Kingston upon Thames Mr. Burke (Store Manager) Primark Stores Ltd, 13 St Ann's Shopping Centre, St Ann's Road, Harrow Together with your CV you should write a covering letter. Here you are given some instructions on how to do this.

Read the instructions and answer the following questions:

What is the covering letter for?

What parts does it contain?

What recommendations are given to you?

**Writing a covering letter**

Your covering letter could make the difference between getting a foot in the door or having it slammed in your face. Covering letters are not just sent as a courtesy, but are an introduction to your potential employer. They are designed to complement your CV and provide extra information about you. The covering letter is the first impression a potential employer will have of you and without a good impact, they may not progress far with your CV.

**Introducing yourself - making an impact**

A covering letter should be concise and ideally no more than three paragraphs long. It needs to introduce you to the potential employer, say what you want to do for the employer, and show how and why you are suited for that particular work. Its main aim is to get your CV read. The style of the covering letter should be reasonably formal and businesslike and match the CV or application form you are sending. It should be typed using a clear font and on good quality, plain white or cream paper, preferably the same as the CV. If you are emailing it, make it look business-like.

Always write to a named individual, whether you are applying for a job or writing a speculative letter. If you don't know who to address the letter to, use your initiative and contact the company to find out the name of the relevant person. Make sure you check the spelling of their name, no one likes to have their name spelled incorrectly. The opening paragraph should let the reader know why you are writing to them. If you are writing to apply for a position with their company, make clear which job you are applying for and where you saw the advertisement, give the title and date of the publication that the vacancy was advertised in. For speculative letters outline what kind of work you are looking for. You need to show an interest in the position you are applying for and that you have some knowledge of the employer. Find out about the company by looking for other advertisements it may have, search the internet for its website, look through the company's literature and scan business journals and newspapers for other general information. Refer to any recent news about the company, this will show you understand what the company is about.

Explain why you want to work there and emphasize what you can do for the company. Avoid using phrases like 'I think I could gain valuable experience with your company' or 'this is an area of my skill I have always wanted to develop'. The employer will hire you because of what you can do for the company, not because of what you think you can get from working there. Be keen, but genuine and avoid using cliché phrases.

Don't state the obvious, e.g. 'I am writing to apply for the position, as you will see from my CV' etc. Rather reword the opening of each paragraph to get straight to the point, e.g. I am confident that my legal experience would make me a suitable candidate for this position and have attached my CV for further reference.

**Why should you get the job?**

Paragraph two needs to tell the employer, in more detail, why you are suited to the job and what skills you have got to offer. Why would the employer benefit from taking you on? This is the most important section of the covering letter and will probably make an employer decide whether to look at your CV or not. You need to flag up two or three of your key selling points and give some concrete information on the skills and experience you have.

Make sure you choose points that relate to the job you are applying for so you can match your skills to their needs. The covering letter also gives you a chance to show off skills that you might not be able to get across in the CV, such as maturity, teamwork or interpersonal skills. Make sure everything you say about your skills and experience in your covering letter is backed up by evidence in your CV.

### **Positive endings**

Don't let your letter fizzle out at the end with just a bland «yours sincerely».

Finish the letter with a strong, proactive phrase which sets the scene for the next stage - being called in for an interview, e.g. 'I am available for interview at your convenience and look forward to meeting you'. If you have addressed the letter to a named person (and you should have done), you should end the letter with yours sincerely, if you wrote Dear Sir or Madam, it should end with Yours faithfully.

Point out several useful phrases that you can use in your covering letter.

Look at the example of a covering letter.

Does it correspond to the instructions given above?

What should you add to the letter to make it better?

Dear Mr. Sorefoot

### **Computer Shop Manager**

Please find enclosed my completed application form for the above position. As you will see from my form, I have ten years' experience with Bates Retail as a Computer Shop Manager.

*I look forward to hearing from you and hope that you will be able to invite me for an interview. I would very much welcome an opportunity to discuss my application in*

*greater detail and convince you that I am the right person for the job.* Yours sincerely Frances Slim waist.

### **6. Выберите и напишите:**

You are looking for a job. Find in the Internet or in the newspaper an advertisement of a job you would like to have. Write your CV and your covering letter to apply for a job.

Useful phrases:

*I wonder if you would be so {kind/good} as to...*

*Will you be so kind as to...*

*Will you kindly...*

*I {shall/should} be {happy/glad/pleased} if you...*

*We are so {happy/glad/pleased} to...*

*We {will/would} be most {happy/glad/pleased} to...*

*I cannot tell you how {happy/glad/pleased} I am to...*

*I have much pleasure in... It gives me great pleasure to...*

*It {is/was/would be} a great pleasure (to me) to...*

*It is a great honour and pleasure to...*

*I enclose {herewith/herein}...*

*You will find {enclosed/with this letter}...*

*Please find enclosed...*

*Attached to this letter you will find...*

*I am very glad of the opportunity to give my {attention/consideration} to...*

*I am very grateful to you for giving so much attention to...*

*I am really happy that I can offer you my {attention/consideration} to...*

*I hope to hear from you soon and remain with kindest personal regards. I hope to receive your favourable reply.*

*We look forward to hearing from you.*

*I am looking forward to hearing you soon.*

*We look forward to the opportunity {of + [gerund]/that}...*

*I look forward to the possibility {of + [gerund]/that}...*

*We look forward to welcoming you in this country.*

*I look forward to the pleasure of hearing you.*

### Практическое занятие №3. ITProfessionals / Специалисты в сфере IT

**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 УК-4.

#### Теоретическая часть:

#### What is an IT Professional and what does one do?

When you hear the title *IT professional*, do you have an understanding what it actually means? Or, what he or she does? If you are a professional of any kind, you are engaged or qualified in a profession that requires special education, skill or training. All three are necessary requirements for an IT professional to tackle today's computing world.

IT professionals characterize or conform to the ethical or technical standards of a profession. Technical standards move forward in every industry. But the speed of the IT industry arguably moves at a broader and rapid pace.

IT, also known as information technology, indicates the transfer or other use of information through computers or computer systems. IT professionals do a number of different tasks. They are the people who test, build, install, repair, or maintain the hardware and software associated with complex computer systems in one or more locations.

Some companies will hire several IT professionals throughout the world in order to maintain their wide range of networks of computer systems. The nature of the internet allows IT professionals to do their jobs from any location. But in certain instances, like when there is a hardware issue, the IT professional will need to physically alter the broken system.

Once an IT professional is employed, he or she will constantly be acquiring new IT skills and training. This is because not every company that IT professionals service will use one coding language, one operating system, one database tool or one methodology.

What an IT professional does can be difficult and requires a significant level of knowledge and skill. However, a college degree is not always a necessary qualification. Many IT professionals do in fact earn degrees from universities and colleges as a way to increase their likelihood of securing a good job.

There are many different types IT professionals that exist. Each type focuses on more than one element of computer system analysis or maintenance. For example, a programmer is an IT professional who creates computer platforms and programs by writing computer code. This particular position is often entry-level, but senior programmers take on more responsibility as they move up. These responsibilities include being in charge of their teams and fixing a damaged program or one that isn't functioning properly.

#### What does a Network Administrator do?

A network administrator is responsible for keeping an organization's computer network up-to-date and operating as intended. Any company or organization that uses multiple computers or

software platforms needs a network admin to coordinate and connect the different systems. Seems simple enough—but there's another common IT job title that may trip you up: systems administrator.

So, is a network administrator the same thing as a systems administrator? In short—not really. But the lines can blur depending on the work environment. Careers in IT can sometimes take a page from the rules of *Whose Line Is It, Anyway?* — «Where the titles don't matter and the duties are made up! » While that's clearly a bit of an exaggeration, in many smaller organizations, the terms «network administrator» and “systems administrator” are often interchangeable as they cover the same tasks. That being said, the differences between network and systems administrators become much clearer in large organizations. The best way to differentiate between the two is to examine the type of work they do—so let's dive in.

The duties of a network administrator will vary considerably depending on the organization they work for. Some work as broad, jack-of-all-trades generalists who cover everything from hardware setup to troubleshooting servers while others have a much narrower focus.

Here are some sample network and systems administrator job duties. In environments where the duties of network administrators and systems administrators are split and more clearly defined, the italicized duties align more with systems administrators:

- Configuring network hardware like servers, routers and switches;
- Upgrading and repairing computer networks;
- Troubleshooting network issues;
- Assisting network architects with the design of network models;
- Deploying and updating software;
- Managing servers and their operating systems;
- Implementing security measures and basic testing;
- Managing cloud and physical network storage.

#### **Вопросы и задания:**

##### **1. Переведите следующие слова и словосочетания из текста:**

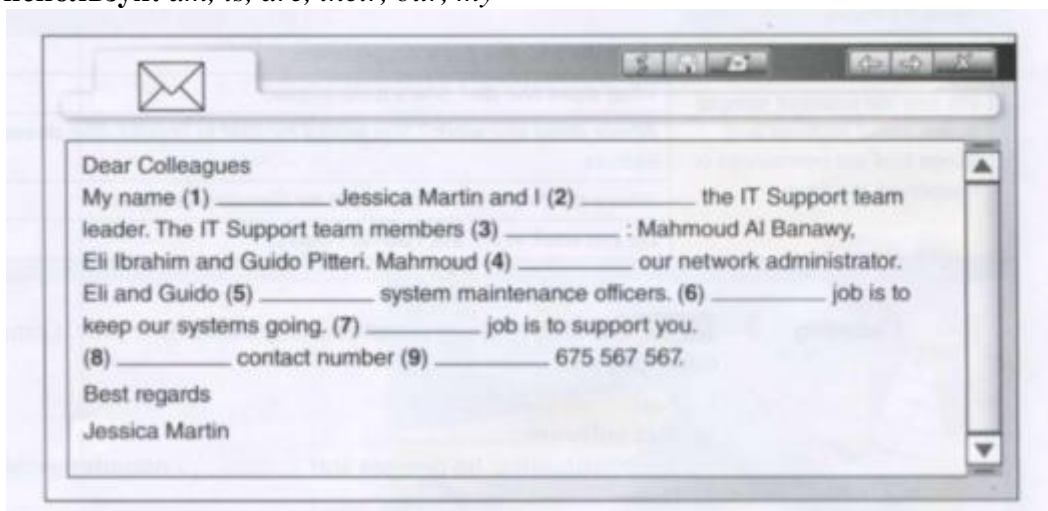
network administrator  
systems administrator  
interchangeable  
a jack-of-all-trades generalist  
hardware setup  
an arrow focus  
to configurator network hardware  
troubleshooting network  
to implement security measures  
to managing servers  
up-to-date network

##### **Заполните пропуски:**

software engineer	computer security specialist	blog administrator	help desk technician
DTP operator	hardware engineer	network administrator	webmaster

- 1 A \_\_\_\_\_ designs and develops IT devices.
- 2 A \_\_\_\_\_ writes computer programs.
- 3 A \_\_\_\_\_ edits and deletes posts made by contributors to a blog.
- 4 A \_\_\_\_\_ uses page layout software to prepare electronic files for publication.
- 5 A \_\_\_\_\_ manages the hardware and software that comprise a network.
- 6 A \_\_\_\_\_ designs and maintains websites.
- 7 A \_\_\_\_\_ works with companies to build secure computer systems.
- 8 A \_\_\_\_\_ helps end-users with their computer problems in person, by email or over the phone.

Джессика Мартин – новый лидер в области IT-поддержки. Она пишет электронное письмо, чтобы представить свою IT-поддержку. Заполните пропуски в письме используя: *am, is, are, their, our, my*



**Вы новый сетевой администратор в компании, напишите своим коллегам электронное письмо, чтобы представиться, дайте свои контакты.**

**Составьте краткое устное изложение текста «Что такое IT-специалист и чем он занимается» (5-7 предложений).**

**Расскажите остальной группе о работе вашей мечты. Используйте свои заметки, чтобы помочь вам.**

*Example: My dream job is...I design/solve/analyze....*

#### Практическое занятие №4.

##### Business correspondence / Деловая переписка

**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 УК-4.

### Теоретическая часть:

#### Письмо-заявка:

Dear Mr Scott,

I am writing to apply for the position of Senior Programmer, which was advertised on 28th March in *The Times*.

I graduated in May 2002 and did a work placement with British Gas as part of my degree. Before taking my present job I worked for a year with NCR. I stayed in this job (1) \_\_\_\_\_ March 2004.

(2) \_\_\_\_\_ the last three years I have been working as a software engineer for Intelligent Software. I have designed four programs in COBOL for commercial use, and (3) \_\_\_\_\_ January I have been writing programs in C for use in large retail chains. These have been very successful and we have won several new contracts in the UK and Europe on the strength of my team's success.

Two years (4) \_\_\_\_\_ I spent three months in Spain testing our programs and also made several visits to Italy, so I have a basic knowledge of Spanish and Italian. I now feel ready for more responsibility and more challenging work, and would welcome the opportunity to learn about a new industry.

I enclose my curriculum vitae. I will be available for an interview at any time.

I look forward to hearing from you.

Yours sincerely,

*Sarah Brown*  
Sarah Brown

**B** Look at the HELP box and then complete the letter with *for, since, ago* or *until*.

#### HELP box

##### *for, since, ago, until*

- We use **for** to refer to a period of time.  
*I've lived in Liverpool **for** five years.*
- We use **since** to refer to a point in time.  
*I've been unemployed **since** May 2005.*
- We use **ago** with the past simple to say when something happened. We put **ago** after the time period.  
*I got married five years **ago**.*
- We use **until** to mean *up to a certain time*.  
*I stayed at high school **until** I was 18.*

#### Вопросы и задания:

**1. Прочитайте и переведите письмо-заявку и дополните его предложенными словами-помощниками.**

**Ответьте на вопросы, используя информацию из письма-заявки**

What job is Sara Brown applying for?

Where did she see the advertisement?

How long has she been working as a software engineer? What type of programs has she written?



When did she spend three months in Spain?

**Мария Кинтана (см. Ее резюме ниже) заинтересована в должности веб-мастера в eJupiter. Используйте ее резюме и напишите письмо-заявку на эту должность. Выполните следующие шаги:**

**Paragraph one:** reason for writing.

*I am writing to apply for the position of ...*

**Paragraph two:** education and training

*I graduated in (date)...*

*I completed a course in...*

**Paragraph three:** work experience

*For the past X years, I have been ...*

*Since X I have been...*

**Paragraph four:** personal skills

*I spent X months in ... (country), so I have knowledge of ... (foreign languages)*

*I can ...*

**Paragraph five:** reasons why you are applying for this job

*I feel ready to... and I would welcome the opportunity to...*

**Paragraph six:** closing, availability for interview

*I enclose..., I look forward to..., I will be available for an interview...*

## Curriculum vitae

### Personal information

**Name:** Maria Quintana

**Address:** Avda Séneca, 5, Madrid 28040

**Telephone:** 00 34 91 5435201

**Email:** mquintana0782@telefonica.net

**Date of birth:** 28/07/82

### Education and Training

2006 Online diploma in web-based technology for business, [www.elearnbusiness.com](http://www.elearnbusiness.com)

2005 Course in web design at the Cybernetics College, London: HTML, Java and Macromedia Dreamweaver

2004 Course in computer hardware and networking at the Cybernetics College, London

1999–2004 Degree in Computer Science and Engineering, University of Madrid

### Work experience

January 2006 – present Part-time Webmaster at [www.keo.es](http://www.keo.es); responsible for updating the site and using Adobe Flash to create animations

May 2005 – December 2006 IT consultant at Media Market, specializing in e-commerce and IT strategies

### IT skills

Knowledge of multiple computer platforms (Windows, Mac and Linux); strong database skills (including the popular open source MySQL database); complete understanding of graphics formats and Cascading Style Sheets

### Personal skills

Social and organizational skills

Good communication skills

### Languages

Spanish mother tongue; English (Cambridge CAE); Arabic (fluent)

### Hobbies and Interests

Web surfing, listening to music and travelling

**Напишите свое резюме на английском, используя резюме Марии в качестве руководства.**

### Практическое занятие № 5. Applying for a job in IT/ Устройство на работу в сфере IT

**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 УК-4.

### **Теоретическая часть:**

#### **Information Technologic Job Interview Questions**

When you are interviewing for an Information Technology (IT) job, in addition to the standard interview questions you will be asked during a job interview, you will be asked more focused and specific technical questions about your education, skills, certifications, languages, and tools you have expertise in.

The hiring manager will want to know, in detail, how equipped you are to handle the position. Prepare for the interview by considering the job qualifications - what skills, knowledge, and experiences you'll need in order to be successful in the job.

Take the job requirements that are included in the posting and make a list of the top qualifications the employer is looking for. Then match your credentials to the list. Be ready to discuss why you have each attribute the company wants. Here's how to match your qualifications to the position's requirements.

Also review this list of common IT interview questions and take the time to prepare responses based on your qualifications for the job.

Providing details will show the interviewer how and why you are qualified for the job. Do keep in mind that the questions you'll be asked will be specific to the job you're interviewing for, so they'll vary.

#### **Questions About You and Your Technical Skills**

- ☐ What interests you about this position?
- ☐ What certifications do you hold?
- ☐ What do you do to maintain your technical certifications?
- ☐ What automated-build tools or processes have you used?
- ☐ What development tools have you used?
- ☐ What languages have you programmed in?
- ☐ What source control tools have you used?
- ☐ What technical websites do you follow?
- ☐ Describe a time when you were able to improve upon the design that was originally suggested.
- ☐ Describe the most innovative change that you have initiated and what you did to implement this change.
- ☐ Given this problem (*problem is based upon job requirements*), what solution would you provide? Explain your thought process.
- ☐ How do you handle multiple deadlines?
- ☐ How do you keep current on this industry?
- ☐ How do you troubleshoot IT issues?
- ☐ Tell me about the most recent project you worked on. What were your responsibilities?
- ☐ Tell me about the project you are proudest of, and what your contribution was.
- ☐ Give an example of where you have applied your technical knowledge in a practical way.
- ☐ What is the biggest IT challenge you have faced and how did you handle it?
- ☐ You are working at a client site and the CTO of the client company has asked if she can see you. The CTO wants to know how much it would cost to bring in five more people on your team. She gives you very vague requirements of the job she is looking for you to do. What would you do?
- ☐ You have been asked to research a new business tool. You have come across two solutions. One is an on-premises solution, the other is cloud-based. Assuming they are functionally equivalent, why would you recommend one over the other?
- ☐ You have submitted a piece of code that has broken the client's website in production. You have found this bug while you were testing, and nobody else knows about it. What is your next move?

- You have learned that a business unit is managing a major component of the business using Excel spreadsheets and Access databases. What risks does this present, and what would you recommend be done to mitigate those risks?

### Вопросыизадания:

Прочитайте текст «Информационные технологии, вопросы собеседования», переведите его. Ответьте на стандартные вопросы ИТ-собеседования, приведенные в тексте.

Обсудите в группе, подаете ли вы заявку на одно из этих заданий. Укажите причины, почему.

***DIGITUM-UK***

**SENIOR PROGRAMMER** required by DIGITUM-UK, a leading supplier of business systems to the insurance industry.

You will be able to work on the full range of software development activities – analysis, design, coding, testing, debugging and implementation. At least two years' experience of COBOL or C++ is necessary. As we are active in Europe, fluency in French, Italian or another European language is desirable. Don't miss this opportunity to learn new skills and develop your career.

Send your CV to CHRIS SCOTT, PERSONNEL MANAGER, DIGITUM-UK, 75 PARKSHILL STREET, LONDON SW14 3DE

*You can visit our website at [www.digitum-uk.com](http://www.digitum-uk.com)*

***DTP operator***

***required for a leading financial magazine.***

We are looking for a bright, competent QuarkXPress operator with at least three years' experience in design and layout. Skills in Photoshop, Freehand or Illustrator an advantage.

Ability to work in a team and to tight deadlines is vital.

Please apply in writing, with CV and samples of your work, to Tom Parker, Production Manager, Financial Monthly, Stockton Street, London EC1A 4WW  
Or apply online:

Apply now

Отметьте наиболее важные качества и способности для каждой работы. Добавьте больше в список, если можете. Какие три вещи вы считаете наиболее важными для каждой работы?

	Senior programmer	DTP operator
1 logical reasoning	<input type="checkbox"/>	<input type="checkbox"/>
2 patience and tenacity	<input type="checkbox"/>	<input type="checkbox"/>
3 being good with figures	<input type="checkbox"/>	<input type="checkbox"/>
4 imagination	<input type="checkbox"/>	<input type="checkbox"/>
5 self-discipline	<input type="checkbox"/>	<input type="checkbox"/>
6 accuracy	<input type="checkbox"/>	<input type="checkbox"/>
7 leadership skills	<input type="checkbox"/>	<input type="checkbox"/>
8 efficiency	<input type="checkbox"/>	<input type="checkbox"/>
9 creativity	<input type="checkbox"/>	<input type="checkbox"/>
10 drawing skills	<input type="checkbox"/>	<input type="checkbox"/>

Напишите руководство по успешному собеседованию на работу в сфере ИТ вместе с одноклассниками.

## РАЗДЕЛ 2:INTERNET / ИНТЕРНЕТ

### Практическое занятие № 6.

#### Тема занятия: TheInternet / Интернет

**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 УК-4.

#### Теоретическая часть:

##### 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:

**Прочтите тексты (по вариантам) и составьте короткую аннотацию на каждый из них.**

##### 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

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 integrate 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 Centers (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.

### **Итоговый тест. Подберите вместо пропусков подходящее по смыслу слово.**

The most common \_\_\_\_\_ for planning the program logic are flowcharting and pseudocode.  
technologies; b) technics; c) techniques

2. \_\_\_\_\_ was designed for dealing with the complicated mathematical calculations of scientists and engineers,

a) COBOL; b) FORTRAN; c) PL/I

3. \_\_\_\_\_ is the foundation of any programming languages.

a set of rules; b) a group of numbers; c) a lot of instructions

I / O \_\_\_\_\_ match the physical and electrical characteristics of input-output devices.

inter changes ; b) interfaces ; c) interprétations

Letter-quality, dot-matrix and ink-jet printers are all \_\_\_\_\_ printers.

line; b) page; c) character

The most common device used to transfer information from the user to the computer is the \_\_\_\_\_.

keyboard; b) printer; c) modem

Input-output units link the computer to its external \_\_\_\_\_.

a) requirement; b) development; c) environment

I / O devices can be classified according to their speed, visual displays being\_\_\_\_\_devices.  
high-speed; b) medium-speed; c) low-speed

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, enterprises 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 interprets 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.                  |

**Определите неличные формы глагола, содержащиеся в следующих предложениях. Переведите их.**

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.

**Выполните перевод предложений:**

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.

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.

### **Практическое занятие № 7.**

**Тема занятия: Internet Applications/ Интернет-приложения**

**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 УК-4.

### **Теоретическая часть:**

#### **The Internet**

The Internet is a magnificent global network with millions and millions of computers and people connected to one another where each day people worldwide exchange an immeasurable amount of information, electronic mail, news, resources and, more important, ideas. It has grown at a surprising rate. Almost everyone has heard about it and an increasing number of people use it regularly. The current estimate is that over 70 million people are connected, in some way, to the Internet – whether they know it or not. With a few touches at a keyboard a person can get access to materials in almost everywhere. One can have access to full-text newspapers, magazines, journals, reference works, and even books. The Web is one of the best resources for up-to-date information. It is a hypertext-based system by which you can navigate through the Internet. Hypertext is the text that contains links to other documents. A special program known as «browser» can help you find news, pictures, virtual museums, electronic magazines, etc. and print Web pages. You can also click on keywords or buttons that take you to other pages or other Web sites. This is possible because browsers understand hypertext markup language or code, a set commands to indicate how a Web page is formatted and displayed. Internet Video conferencing programmers enable users to talk to and see each other, exchange textual and graphical information, and collaborate. Internet TV sets allow you to surf the Web and have e-mail while you are watching TV, or vice versa. Imagine watching a film on TV and simultaneously accessing a Web site where you get information on the actors of the film. The next generation of Internet-enabled televisions will incorporate a smart-card for home shopping, banking and other interactive services. Internet-enabled TV means a TV set used as an Internet device. The Internet is a good example of a wide area network (WAN). For long distance or worldwide communications computers are usually connected into a wide area network to form a single integrated network. Networks can be linked together by telephone lines or fibre-optic cables. Modern telecommunication systems use fibre-optic cables because they offer considerable advantages. The cables require little physical space, they are safe as they don't carry electricity, and they avoid electromagnetic interference. Networks on different continents can also be connected via satellites. Computers are connected by means of a modem to ordinary telephone lines or fibre-optic cables, which are linked to a dish aerial. Communication satellites receive and send signals on a transcontinental scale.

#### **Вопросы задания:**

##### **Переведите:**

What do people do with the help of the Internet? Make a list of the typical Internet applications.

Read the website descriptions.

**paralegal.com** Fed up with paying exorbitant legal fees? Get leading-edge legal services at a fraction of the cost of going to a law firm. E-mail our legal team for low-cost advice on all



aspects of company and tax law. *Download* specialist up to - the-minute documents for a small *charge*. Conduct your own court cases with our help and save thousands of euros! No win, no fee!

**bespontaneous.com** Be spontaneous! Do something on the spur of the moment. Book otherwise impossible-to-get tickets to theatre and sports events. Ready to fly tomorrow? Take a break to one of our popular destinations: beach or city. Worry-free booking by credit card on our secure *server*. Next-day courier delivery of tickets to your door.

**worldweather.com** Want to see what the weather's like anywhere in the world? Come to worldweather.com! Consult free forecasts for 100 world cities. Download stunning satellite pictures of the world's increasingly unpredictable weather for free. Deluxe, framed versions of these pictures make beautiful gifts. Order on-line. Delivery within 48 hours.

**d)goinggoinggone.com** Consumer electronics products auctioned daily: computers, TVs, washing machines, you name it. It's so simple: put in your bid and we'll notify you by e-mail of the competing *bids*. You can raise your bid as many times as you like over a three-day period. If your bid is the highest at the end of three days, pay by credit card and goods are delivered to you within 24 hours.

1. You consult this site if you are not sure what clothes to take with you on a trip.
2. This site tries to reassure users who may be worried about giving their credit card details on-line.
3. This site mentions a delivery method that does not use the ordinary post office service.
4. This site does not mention physical delivery of goods or documents.
5. On this site, you can order a picture to put on your wall.
6. On this site, you can offer a price for something, but you won't necessarily get it.
7. On this site, there is a service that you may have to pay for or that may be free, depending on the results.

### Словарный запас:

We often use the terms below to speak about different Internet applications.

Put the appropriate terms in the table.

#### *English equivalent Russian equivalent*

сеть

поисковая система

browse

поиск

chat

доступ

link hit

загружать

Match the terms to their definitions  
browser A utility that will search the Internet, an Intranet, a site, or a database for terms that you select.  
chat an active connection to another web page, location in a web page, file, or other Internet resource.  
download A computer in a network that provides access to other computers in the network to programs, web pages, data, or other files and services, such as printer access or communications access.  
hit A form of real-time electronic communications where participants type what they want to say and it is repeated on the screens of all other participants.  
link to transfer a file from another system to your own computer system via a modem over telephone or cable lines or a telnet connection using a transfer protocol.  
search engine Software that will load and display a web page. It interprets the HTML or XML code from the web page files, executes embedded scripts and programs, displays graphics, plays music and video, and provides links to related pages.  
server Every listing a search engine returns from a search. This term is also used to refer to calls on a web server, and it is much misunderstood.

**Продолжите следующие предложения, чтобы говорить о функциях Интернета и Приложения:**

- Internet is a .....
- The function of the Internet is .....
- The Internet offers the following services .....
- An Internet-enabled TV set is .....
- WAN is .....
- Networks are connected with each other .....

Подберите слова, чтобы составить предложения об интернет-приложении:

1. dish .....access
2. to be connected ..... information
3. electromagnetic ..... through
4. worldwide .....markup language
5. wide area .....information
6. to get ... .....via
7. hypertext .....communications
8. to navigate .....interference
9. up-to-date .....network
10. to get ..... aerial  
smart .....card

Дополните эти предложения несколькими словосочетаниями из списка, чтобы говорить о производительности интернета:

- ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
- omputers are connected by means of a modem to ordinary  
telephone lines or fiber-optic cables, which are linked to a ....
- ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
- he next generation of Internet-enabled televisions will incorporate  
a ... for home shopping, banking and other interactive services.
- ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
- nternet Video conferencing programs enable users to talk to  
see each other, ..., and collaborate.
- Networks on different continents can also ... satellites.
- For long-distance or, ... computers are usually connected into  
a wide area network to form a ....
- The Web is one of the best resources for ....
- With a few touches at a keyboard a person can ... to materials  
in almost everywhere.

### **Проектная работа:**

Sum up the most widely spread Internet applications.

Make several groups and prepare a report about each Internet application with your own examples.

- *Getting news from the Internet;*
- *Internet shops;*
- *Internet travel agencies*
- *Communication through the Internet*
- *Earning money through the Internet*

Pre-task: While listening make a list of advantages and disadvantages of using Internet for these applications in comparison with the traditional ways of getting news, buying something in the shops, spending holidays, and communicating with each other.

*Group 1: Internet news ADVANTAGES DISADVANTAGES -*

What advantages has the group mentioned?

- Can you choose any news you like?
- Do you depend on time searching for news?
- What are the disadvantages?
- Is the Internet information always true?

How about the yellow press? Is it available in the Internet? *Group 2: Internet shops*

What do you need to make a purchase?

Are you able to buy anything you need?

Are the goods always legal?

Are the prices high?

What is the advantage of traditional shop in purchasing food and clothes?

Are you able to get a piece of advice from the shop assistant?

Are you able to ask for help in the consumer department?

Do they provide their clients with more full information?

Do the sites contain any information about the clients' impressions on the trip?

Is it convenient for the clients?

Is the agent's opinion/advice important to you?

Are you able to get any compensation in the case of your dissatisfaction with the trip? *Group 4: Communication through Internet*

What opportunities do these sites offer to the clients?

Is it easy to find friends with common interests by the Internet

Is it possible to find additional information about the people you communicate with?

Are you sure that your correspondence is confidential and nobody can read it?

Do you lack visual contact in communication?

Post-task: Make your own prediction about the future. Will the Internet communication replace traditional one completely?

#### **Работа с Интернетом:**

Sum up the ideas about the advantages and disadvantages of using Internet. Add more ideas to the list.

Read some more information about Internet disadvantages and the problem of security in your course books. <http://www.buzzle.com/articles/advantages-disadvantages-internet.html>  
<http://www.youthvillage.co.za/2013/09/advantages-disadvantages-usinginternet-2/>  
<http://smallbusiness.chron.com/advantages-disadvantages-business-usinginternet-business-activity-27359.html>

You are a reporter in a local newspaper. Write an article by the title: "Internet is conquering the world".

### **Практическое занятие № 8.**

#### **Websites / Вебсайты**

**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 УК-4.

#### **Теоретическая часть:**

## Types of websites

Typically, a website falls under one of the following broad categories;

- Non-editable brochure website (often referred to as static site).

- Editable brochure website (requiring a content management system).

- Editable, dynamic website, with more user engagement (login areas etc.) and self-managed through a content management system.

- e-commerce site – integrated with a payment gateway such as PayPal, Stripe or banks like Barclays or HSBC.

- A progressive web application – when a website requires lots of bespoke functionality or processes it generally falls under the web application category.

Deciding on which type of site you require depends on what you actually want the website to do. If you just want a website, because you feel you should have one, a simple brochure website is all that's required. In an ideal world, no website should ever be completely static and not change, but you have to be realistic what's achievable with your resources.

### **Brochure websites – static or content managed**

A brochure website is quite often an online extension of your sales collateral; outlining the who, what & where of your business. It is how most organizations start out on the web. For some, a simple online brochure that rarely changes is enough. However, most small businesses at least require the option to add and edit their own news articles. In these situations, a simple tool like Perch is ideal. This allows the maximum of creativity, with the added option of making some elements of the page editable. Our own website is built on Perch. Most of the website briefs or requests for a proposals that we receive specify a full content management system (CMS). In reality, most organizations don't actually use the full capabilities of the CMS, only ever updating their news and staff pages. So, as mentioned earlier, be sure that you have the resources available before you start down the 'full CMS' path.

### **E-commerce**

The e-commerce platform has been produced thousands of times, it's been refined, improved upon and extended. As with the content management systems, there are many excellent e-commerce platforms available. Ranging from the cheap and easy to setup hosted options like Shopify through to the more advanced Magento.

When deciding which approach to take, be clear about your requirements. How many product lines, how many variants of each product, do you need to integrate it with a fulfilment house? Which payment gateway do you want to use? (If you're not sure, compare them here: [Payment Brain](#)) All of these decisions will influence the approach you need to take.

E-commerce websites demand a lot more attention than a normal brochure website. You simply cannot build it and expect to see orders come rolling in, it isn't like that. So be prepared to market the business and work hard to gain traction in your market.

A good tip for e-commerce sites is to learn from the masters. Online giants like ASOS invest millions into their online strategy, why not piggyback a few ideas from them? So take a look at their website, both on your smart phone and desktop PC to see how they are presenting their products and organizing their site.

### **A progressive web application**

If you need to do more than just host information about your organization or collect user contact forms you are probably looking at a web application. Effectively, we can build a web application to do any job you require. We can build systems to access complex database, manage offline subscriptions through an online interface and anything else you can dream of.

We develop web applications using the Laravel framework. This is a bit like the foundations of which you build the application on. A set of guiding principles, if you like. Normally progressive web applications will integrate and engage with other web

services and platforms through APIs (Application Programming Interfaces) - these are standardized ways of transmitting data backwards and forwards. By doing this you can integrate services from a variety of suppliers to work together to create your own application, product or service.

**Вопросы и задания:**

**Прочитайте и переведите текст «Типы сайтов» и ответьте на вопросы:**

Which websites do you use in your work and study?

Why do people visit organizational websites?

Why do people visit company websites?

Why do people visit entertainment websites?

What does CMS stand for?

**2. Завершите эти предложения на значении сайтов глаголами: *offer, practice, present, promote, read, sell, share***

Example: The purpose of Nationalgeographic.com is to present information on topics.

1 People visit CNN.com to \_\_\_ international news.

2 Some websites want to \_\_\_ a service.

3 Companies use Amazon.com \_\_\_ to their products.

4 Thegreenshoppingguide.co.uk wants to \_\_\_ environmentally friendly shopping.

5 Students visit Math.com \_\_\_ to their math's.

6 English teachers join eltforum.com to \_\_\_ teaching resources.

**3. Сопоставьте инструменты анализа веб-сайта (1-5) с описаниями (a-e):**

1 traffic a) information about where the visitors to your site are from

2 meta tag b) invisible information (e.g. a hidden keyword) on a website

3 visitor map c) information about a user and the sites they browse

4 user profile d) increasing the number of visitors to your site

5 page optimization e) the movement and actions of visitors to your site

**Расскажите группе, какие ваши любимые сайты? Почему? Используйте слова, чтобы описать их: *beautiful, well-designed, easy-to-use/navigate, clear, reliable, useful, informative, fun, funny, exciting, interesting.***

**5. Работа в парах. Студент А является разработчиком веб-сайта. Студент Б является заказчиком. Задавайте и отвечайте на вопросы о требованиях сайта. Поменяйтесь ролями.**

Example: A: What is the name of your company? B: It's called/Its name is....

**Практическое занятие № 9.  
Network systems / Сетевые 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.

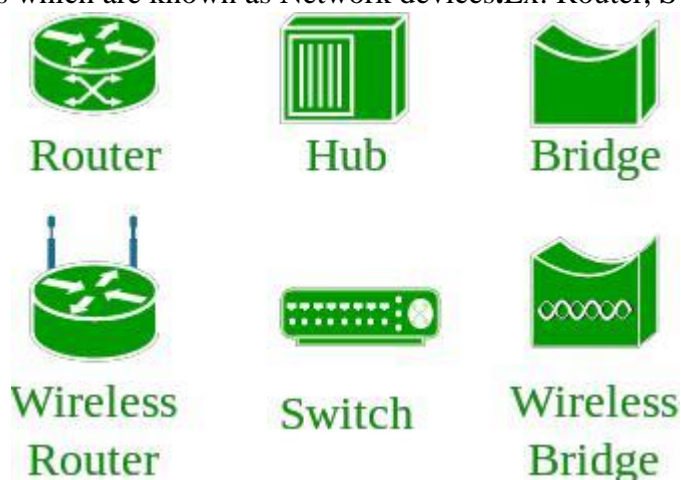
Актуальность темы обусловлена необходимостью овладения УК-4.

### Теоретическая часть: Basics of Computer Networking

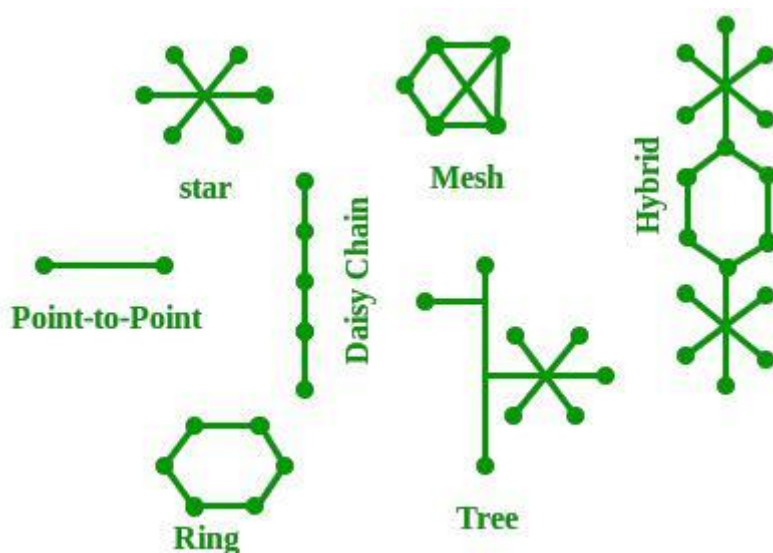
**Open system:** a system which is connected to the network and is ready for communication.

**Closed system:** a system which is not connected to the network and can't be communicated with.

**Computer Network:** it is the interconnection of multiple devices, generally termed as Hosts connected using multiple paths for the purpose of sending/receiving data or media. There are also multiple devices or mediums which helps in the communication between two different devices which are known as Network devices. Ex: Router, Switch, Hub, Bridge.



The layout pattern using which devices are interconnected is called as network topology. Such as Bus, Star, Mesh, Ring, Daisy chain.



**OSI:** OSI stands for **Open Systems Interconnection**. It is a reference model that specifies standards for communications protocols and also the functionalities of each layer.

**Protocol:** Protocol is the set of rules or algorithms which define the way how two entities can communicate across the network and there exists different protocol defined at each layer of OSI model. Few of such protocols are TCP, IP, UDP, ARP, DHCP, FTP and so on.

### UNIQUE IDENTIFIERS OF NETWORK

**Host name:** each device in the network is associated with a unique device name known as Hostname.

Type “hostname” in the command prompt and press ‘Enter’, this displays the hostname of your machine.

**IP Address (Internet Protocol address):** also known as Logical Address, is the network address of the system across the network. To identify each device in the world-wide web, Internet Assigned Numbers Authority (IANA) assigns IPV4 (Version 4) address as unique identifier for each device on the Internet. Length of the IP address is: 32-bits. (Hence we have  $2^{32}$  ip addresses available.) Type “ipconfig” in the command prompt and press ‘Enter’, this gives us the IP address of the device.

**MAC Address (Media Access Control address):** also known as physical address is the unique identifier of each host and is associated with the NIC (Network Interface Card). MAC address is assigned to the NIC at the time of manufacturing. Length of the MAC address is: 12-digit/ 6 bytes/ 48 bits Type “ipconfig/all” in the command prompt and press ‘Enter’, this gives us the MAC address.

**Port:** Port can be referred as logical channel through which data can be sent/received to an application. Any host may have multiple applications running, and each of this application is identified using the port number on which they are running on.

### Вопросыизадания:

**Прочитайте и переведите текст «Основы компьютерных сетей» и ответьте на вопросы:**

What computer networks do you use in your work or studies?

What do you use the networks for?

Howdoyouaccessthenetworks?

What problems do you have with networks?

**Сопоставьте слова (1-8) с описаниями (a-g):**

a modem a) is an entrance to another network

a repeater b) channels incoming data but maintains the bandwidth speed

a bridge c) allows wireless devices to connect to the network

a router d) modulates and demodulates the data into a digital or an analog signal

5.a gateway e) channels incoming data but shares the bandwidth among the devices present on a network

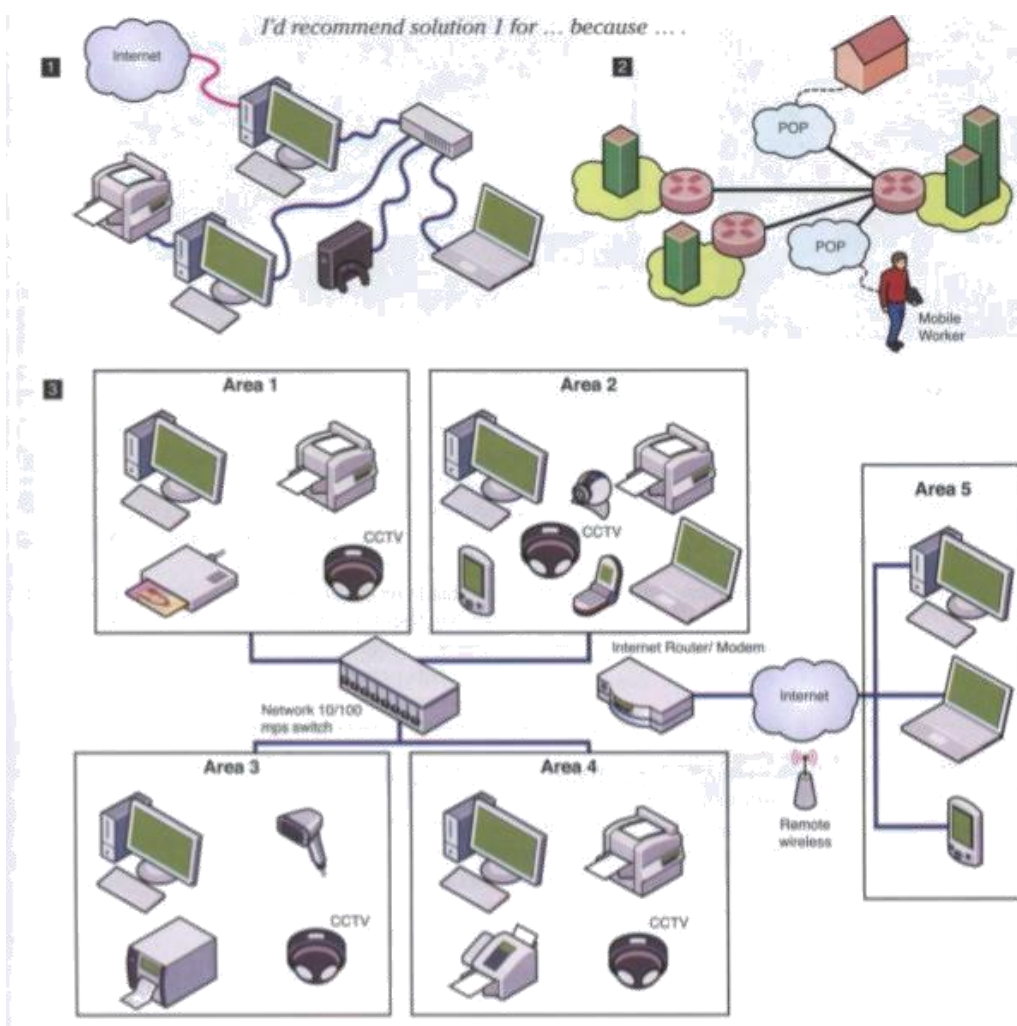
6.a hub f) sends the digital signal further on in the network

7.a switch g) connects networks and sends packages of data between them

8. a wireless access point h) connectsnetworksthatusethe sameprotocol

**Посмотрите на три сетевых решения. В чем различия? Какое сетевое решение вы бы порекомендовали для крупной корпорации или организации, малого бизнеса и семейного дома? Почему?**

*Example: I'd recommend solution 1 for ... because ....*



**Прочитайте эти тексты и ответьте на эти вопросы:**

How many things does network range depend on?

What can reduce network range?

What can improve network range?

What two things affect speed?

**Range.** Wireless networks have limited range. Network range depends on the type of 802.11 protocol, strength of the device transmitter and the architecture of the surrounding area. Some structures, such as walls and metal frames, reduce the range of a WLAN by 25%. However, users can extend the range of a WLAN. Repeaters forward the wireless signal to access points or routers and increase the range of a network.

**Speed.** Bandwidth and latency are the measures of computer network speed, or data transfer rate. Bandwidth is the maximum throughput of data in bits per second. Some modems support 100 Gbit/s but speed depends on the hardware and software used. Latency is the delay that network creates during the transfer data. Users have no, or very little, control over bandwidth and latency.

### Практическое занятие № 10.

#### Network range and speed / Диапазон сети и скорость

**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 УК-4.

### **Теоретическая часть:**

#### **Range**

Wireless networks have limited range. Network range depends on the type of 802.11 protocol, strength of the device transmitter and the architecture of the surrounding area. Some structures, such as walls and metal frames, reduce the range of a WLAN by 25%. However, users can extend the range of a WLAN. Repeaters forward the wireless signal to access points or routers and increase the range of a network.

#### **Speed**

Bandwidth and latency are the measures of computer network speed, or data transfer rate. Bandwidth is the maximum throughput of data in bits per second. Some modems support 100 Gbit/s but speed depends on the hardware and software used. Latency is the delay that network creates during the transfer data. Users have no, or very little, control over bandwidth and latency.

### **Вопросыизадания:**

#### **1. Читайте тексты о скорости и дальности, переводите их и отвечайте на эти вопросы.**

How many things does network range depend on?

What can reduce network range?

What can improve network range?

What two things affect speed?

#### **Прочитайте, переведите и завершите диалог словами:**

*What about, change, devices, necessary, problem, speed, should, user.*

Boris: I have a problem with the network download (1) \_\_\_ you suggest?

Ahsan: Why don't you (2) \_\_\_ the hub?

Boris: I don't think that will work. The hub is fine.

Ahsan: OK. How (3) \_\_\_ adding a repeater then?

Boris: Hmm, I'm not sure it will help. It's not a (4) \_\_\_ with the signal strength.

Ahsan: OK, then you should check the cables and network (5) \_\_\_. Make sure that they are compatible with your network.

Boris: (6) \_\_\_ about changing the modem?

Ahsan: I don't think it's (7) \_\_\_. I think it's a problem with the bridge, switch or the router look at the specifications. You (8) \_\_\_ look at the specifications.

Boris: OK, I will. Thanks for your help.

Ahsan: Why don't you check recommendations on the Internet (9) \_\_\_ as well?

Boris: Good idea. I'll do that.

#### **3. Скажите эти скорости и диапазоны.**

156 feet

7,000 meters

12kbit/s

95 Mbit/s

4Gbit/m  
65 Mbit/s

Запишите четыре скорости и диапазона и продиктуйте их своему партнеру.

5. Карам и Наташа работают в компании ComHelp. Компания предоставляет ИТ-услуги клиентам. Карам и Наташа работают в разных районах города. Каждую неделю они пишут отчет для своего босса. Прочитайте их заметки.

	Monday	Tuesday	Wednesday	Thursday	Friday
Natasha	called CISCO about a training do paperwork	went to British Council to install new software	attended the training on network cabling	day off	had a meeting with the team
Karam	went to TESCO to fix Cat6 cables	set up LAN in a paper factory	day off	installed an audio/video server in Welcare hospital	
You					

□

Ã □

Ã □

Ã □

апишите отчет о том, что вы сделали на прошлой неделе. Пример: на прошлой неделе я ... В понедельник я ... и ....

### Практическое занятие № 11. E-commerce / Электронная коммерция

**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 УК-4.

#### Теоретическая часть:

**Shayan is telling Monika how customers will pay for something online on a new website.**

Complete this dialogue with the words: *accounts, gateway, bank, payment, completes, rejection, confirmation, web, customer, First*

Monika: Shayan, can you explain how a customer (1) \_\_\_ an online transaction?

Shayan: OK, it's very easy. (2) \_\_\_ the customer will place an order. The seller's (3) \_\_\_ server will confirm availability of the product and send a response. After that, the customer checks out and completes the (4) \_\_\_ instructions. Then the server will send a payment request to a payment (5) \_\_\_\_ The payment gateway will check the buyer's ability to pay with the (6) \_\_\_\_ OK?

Monika: Fine. Go on.

Shayan: The bank will respond and send payment acceptance or (7) \_\_\_\_ to the seller's web server through the payment gateway. Finally, the customer will receive the server response with the order (8) \_\_\_\_ or rejection.

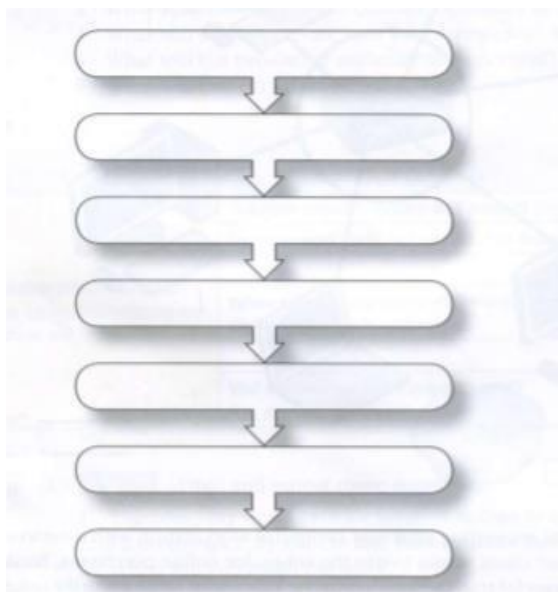
Monika: Will the (9) \_\_\_\_ have to register?

Shayan: Yes, all buyers must have their (10) \_\_\_\_ before they complete the transaction.

Monika: Thank you. Now I understand.

**Вопросы и задания:**

**Заполните блок-схему процесса покупки онлайн. Тогда объясни это своему партнеру:**



**2.Прочтите это письмо. Ответьте на эти вопросы:**

How many security features will the company have?

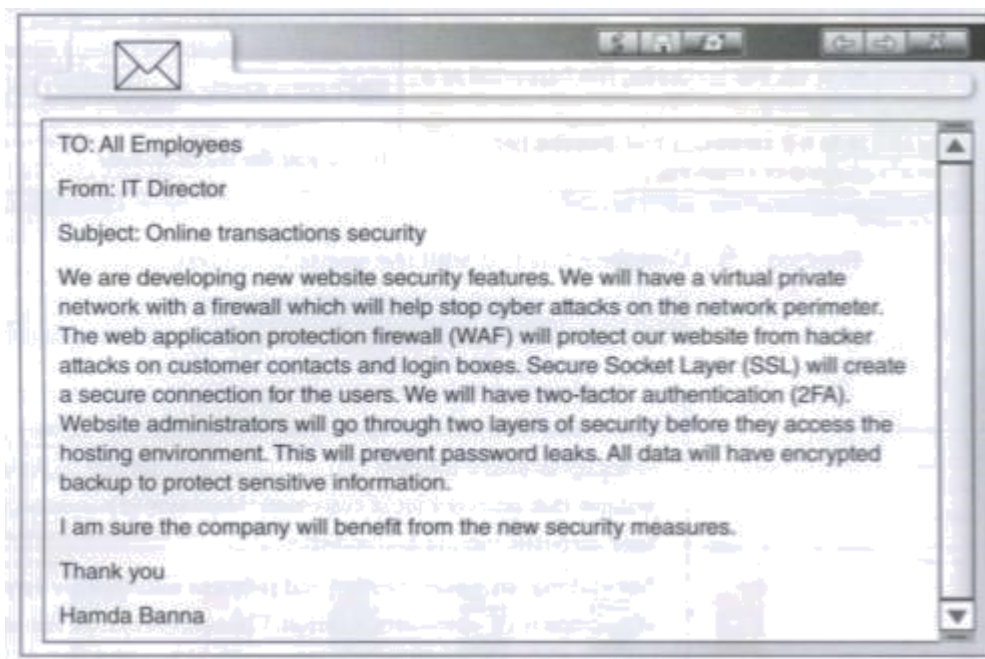
Which security feature will stop attacks on the company network?

What solution will protect customer contacts and login boxes?

What will protect private user information sent over the network?

What will the two-factor authentication prevent?

What will protect information?



**Каковы потенциальные угрозы безопасности для покупок в Интернете? Обсудите ваши идеи с группой.**

**4. Вы работаете на SellOnline.com. Компания разрабатывает решения для электронной коммерции для малого бизнеса. Ваш клиент, ООО Документ, продает канцтовары. Они продают много разных видов продукции. DocumentLtd хочет развивать свое присутствие**

**Интернете для более эффективного взаимодействия с клиентами. Заполните шаблон предложения. Используйте эти вопросы, чтобы помочь вам.**

1. What type of E-commerce will Document Ltd offer?
2. What E-commerce technologies will Document Ltd use to attract customers?
3. What security solutions will the company set up in order to protect both the customer and the company?
4. What tools and features will the company website have?
5. How will the customer complete transactions?

Proposal No. 2011/123/45	Date:
Customer:	Business activity:
Subject:	
E-commerce type:	
E-commerce technologies:	
Security solutions:	
Website features and tools:	
Transaction process:	
Proposal presented by:	

## Практическое занятие № 12.

### Transaction Security / Безопасность платежей

**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 УК-4.

### Теоретическая часть:

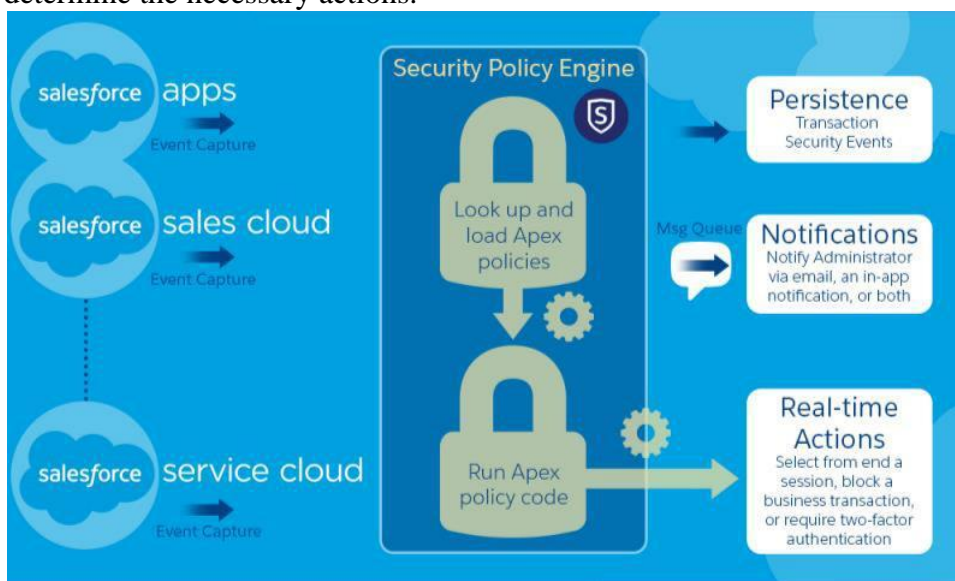
#### Transaction Security Policies

Transaction Security is a framework that intercepts real-time Sales force events and applies appropriate actions and notifications based on security policies you create. Transaction Security monitors events according to the policies that you set up. When a policy is triggered, you can receive a notification and have an optional action taken.

Policies evaluate activity using events that you specify. For each policy, you define real-time actions, such as notify, block, force two-factor authentication, freeze user, or end a session.

For example, suppose that you activate the Concurrent Sessions Limiting policy to limit the number of concurrent sessions per user. In addition, you change the policy to notify you via email when the policy is triggered. You also update the policy's Apex implementation to limit users to three sessions instead of the default five sessions. (That's easier than it sounds.) Later, someone with three login sessions tries to create a fourth. The policy prevents that and requires the user to end one of the existing sessions before proceeding with the new session. At the same time, you are notified that the policy was triggered.

The Transaction Security architecture uses the Security Policy Engine to analyze events and determine the necessary actions.



A transaction security policy consists of events, notifications, and actions. For example, when a user tries to export Account data, you can block the operation and get notified by email.



**Вопросы и задания:**

**1. Прочитайте и переведите текст «Политики безопасности транзакций» и ответьте на вопросы:**

What are the main features of a transaction security policy?

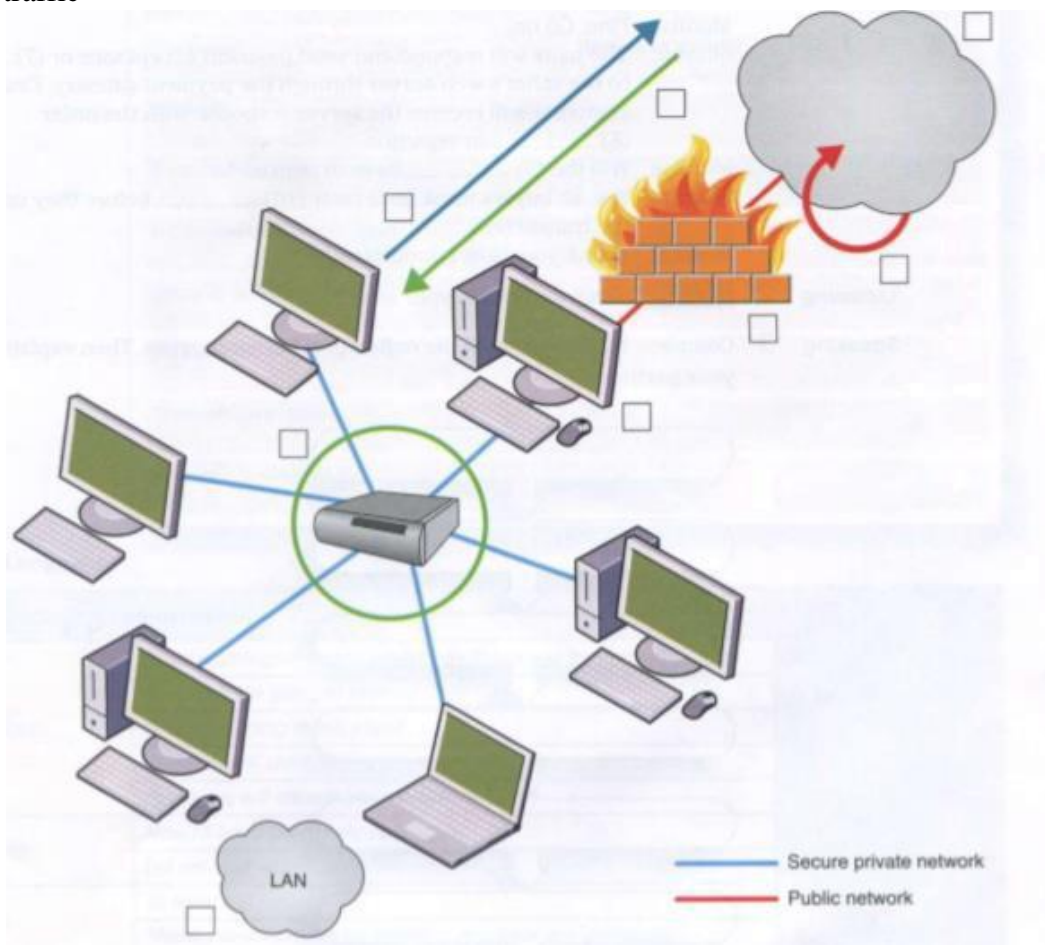
What does a transaction security policy consist of?

How easy do you think it is to infiltrate the Internet and steal sensitive information?

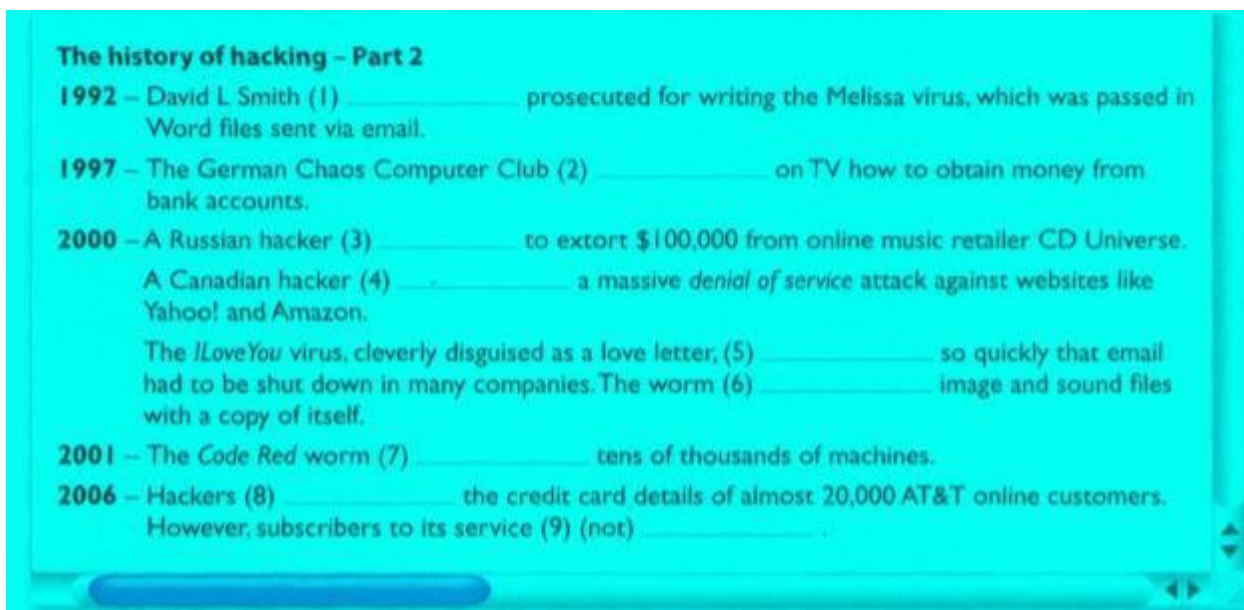
How can you protect your computer from spyware?

**2. Пометьте схему сети правильным пунктом 1-8. Переведите условия на русский.**

the Internet; 2. the local area network; 3. the hardware firewall (with a router); 4. computers with firewall software; 5. outbound traffic; 6. inbound traffic; 7. restricted traffic; 8. allowed traffic



**Завершите текст «История взлома» глаголами в Past Simple: *show, spread, steal, launch, attempt, overwrite, be, infect, affect***



Прочитайте определение «киберпреступность» ниже. Какие виды киберпреступлений вы знаете?

**Cybercrime**, or **computer-oriented crime**, is the crime that involves a computer and a network. The computer may have been used in the commission of a crime, or it may be the target. Cybercrimes can be defined as: "Offences that are committed against individuals or groups of individuals with a criminal motive to intentionally harm the reputation of the victim or cause physical or mental harm, or loss, to the victim directly or indirectly, using modern telecommunication networks such as Internet (networks including chat rooms, emails, notice boards and groups) and mobile phones (Bluetooth/SMS/MMS)". Cybercrime may threaten a person or a nation's security and financial health.

**1. Discuss these question in a group:**

What measures can be taken by government to stop cybercrime?

Which cybercrimes are the most dangerous?

Do you think that the governments have the right to censor information on the Internet?

Personal information such as our address, salary, civil and criminal records is held in databases by marketing companies. Do you think our privacy is in danger?

**Практическое занятие № 13.**  
**IT-security / Информационная безопасность**

**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;

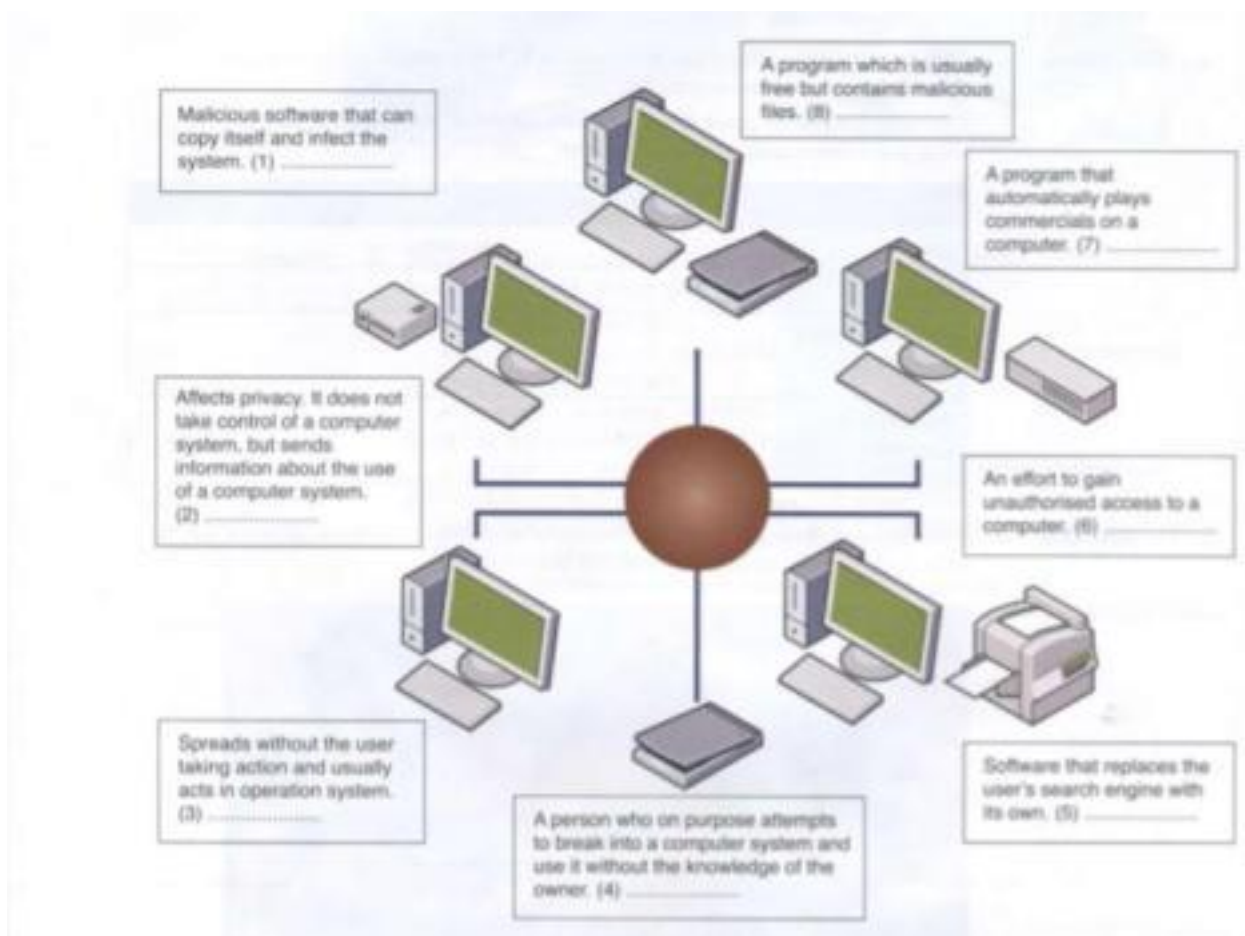
**владеть:** навыками профессионального общения на английском языке; способами пополнения профессиональных знаний из оригинальных источников на английском языке.

**Актуальность темы** обусловлена необходимостью овладения УК-4.

**Теоретическая часть:**

### Read the descriptions 1-8.

Сопоставьте слова с описаниями: *adware, hacker, browser, hijacker, malware, attack, spyware, Trojan, virus, worm*



### Вопросы и задания:

1. Работа в парах. Составьте список всех различных слов об угрозах безопасности и атаках, которые вы можете придумать.

2. У вас когда-нибудь была угроза компьютерной безопасности? Кто-нибудь когда-нибудь взламывал вашу компьютерную систему? Используйте слова и фразы на картинке выше, чтобы описать, что произошло.

3. Подберите решение по безопасности (1-5) для его цели (а-е):

- a) prevents damage that viruses might cause
- antivirus software b) make sure only authorised people access the network
- authentication c) checks the user is allowed to use system
- username, password and d) blocks unauthorised access codes biometric scanning
- encryption e) protects the system from public access

4. Сообщение об инцидентах. Вы когда-нибудь сообщали об инциденте безопасности? О чем это было?



Прочитайте эти пять ИТ-инцидентов в компании.

**A**

**Incident report**

Date: 02.05

Report for: Miley O'Hara

Report prepared by: Ann Greshon

Incident: teacher has accessed the database to change student's grade

Recommendations:

**B**

**Incident report**

Date:

Report for:

Report prepared by:

Incident: employee has changed the printer settings

Recommendations:

**C**

**Incident report**

Date:

Report for:

Report prepared by:

Incident: employee's children have installed games on company's laptop

Recommendations:

**D**

**Incident report**

Date:

Report for:

Report prepared by:

Incident: employee has downloaded a movie

Recommendations:

**E**

**Incident report**

Date:

Report for:

Report prepared by:

Incident: employee has installed P2P software

Recommendations:

5. Работа в парах. Оценка инцидентов: 1 = наименее серьезный. 5 = самый серьезный. Затем сравните свои оценки в небольших группах.

6. Напишите краткий отчет ИТ-супервайзеру о самом серьезном инциденте. Вам нужно будет дать рекомендации о том, как бороться с инцидентом.

#### Практическое занятие № 14.

##### IT-support / IT поддержка

**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 УК-4.

## Теоретическая часть:

### What is IT Support?

Despite the rapid advances in Information Technology (IT) and its equally rapid integration into our everyday lives, the area of IT remains somewhat of an enigma to many people who don't work in the field.

On a literal level, IT support is an incredibly broad term that refers to any assistance given with technology-related products and services. In a business setting however, the role of an IT technical support officer is primarily to help monitor and maintain computer systems and networks across an organization.

They are responsible for everything from the installation and configuration of computer systems, to the diagnostics of hardware and software, and trying to solve any problems that may arise.

Once associated with a basement team of tech geeks who only made themselves known in the event of a computer crashing or a printer breaking, the world of IT support has evolved into a fast-paced and complex sphere of cutting edge skills and real-time problem solving. It is also a central factor of many successful businesses, across every industry.

The importance of IT support should not be overlooked. Any company using computers - which in this day and age is practically every company - will need to consider their IT solutions if they are to make the most of the technology. Technical support is not just about fixing problems, but optimizing the usability and performance of each and every component within a system. On top of this most IT companies will create technology road maps for businesses to keep them up to date and secure for the years ahead.

Another crucial reason for any business to enlist IT support is to keep their network as safe as possible from potential cyber threats. An IT professional will have the necessary knowledge to determine which security solution will work best, and to then install that solution and even monitor its effect.

Outsourcing IT support can be a cost effective way to keep everything running smoothly, without affecting the overall structure of an organization thus ideal for companies in a time of growth. It can also be tailored to the needs of the business. For example, it can be provided as a one-off service in the case of an emergency, or as an on-going contract with varying degrees of responsibility.

### Вопросы и задания:

**Прочитайте и переведите текст «Что такое ITSupport?» И составьте список**

**проблем с компьютером.**

**Прочитайте этот диалог и дополните его словами:** *checked, disconnected, found, go, switched, type, tight, unplugged, worked, working*

Haider: Hello, IT Help Desk.

Maryam: Hi, this is Maryam from Human Resources.

Haider: Hi, this is Haider. How can I help you, Maryam?

Maryam: I (1) \_\_ my computer off yesterday and today I can't turn it on. Haider: What (2) \_\_ of computer do you have?

Maryam: I'm not sure. It's a desktop computer. It (3) \_\_ fine yesterday.

Haider: Don't worry. Have you (4) \_\_ the cable connections?

Maryam: No, I haven't. I can see some cables but I don't know which cable goes where. Haider: Make sure all cables are (5) \_\_ and fully plugged in.

Maryam: Ok, give me a sec. Oh, I think I've (6) \_\_ the problem. I have one cable that is (7) \_\_ It's the power cable.

Haider: Where does it go? The power cable should (8) \_\_ in the three-pronged port on the computer.

Maryam: OK, done. Let me try now. It's (9) \_\_ fine. Sorry about that. Stupid of me.

Haider: Maybe the cleaners (10) \_\_ your PC by mistake last night.

Maryam: Maybe. Good, we've solved the problem. Thank you, Haider.

Haider: Your welcome. Have a good day.

Maryam: You too.

**Заполните эти вопросы с помощью иметь или имеет и правильную форму глагола в скобках. Переведите их.**

\_\_\_ you \_\_\_ (run) the computer in the battery mode?

How long \_\_\_ you \_\_\_ (have) the iPad?

\_\_\_ you \_\_\_ (charge) the battery?

\_\_\_ he \_\_\_ (open) the file?

5. \_\_\_ she \_\_\_ (enter) her username and password?

Ä □ Ä Ä

ÄÄÄ □

Ä □

\_ they \_ (change) the Internet Service Provider?

Ä □ Ä Ä

ÄÄÄ □

Ä □

\_\_\_ you \_\_\_ (check) the remaining disk space?

Ä □ Ä Ä

ÄÄÄ □

Ä □

\_ you \_ (install) or (uninstall) software recently?

Ä □ Ä Ä

ÄÄÄ □

Ä □

\_ Dillip \_ (update) the drivers recently?

**Используйте настоящее совершенное, чтобы делать положительные или отрицательные предложения.**

*Example: the screen/go/blank. The screen's gone blank.*

the charger/stop/working

I/not/upgrade/the operating system

She/not/install/the updates

They/reinstall/the application

She/not/be able to fix the problem

6. I/defragment/yourdrive

**5. Сопоставьте диагностические инструменты (1-4) с описаниями (a-d).**



It measures electrical properties such as AC or DC voltage, current and resistance. It troubleshoots electrical problems in batteries, power supplies, and wiring systems.

It is an electronic device that checks the electrical connections in wired devices.

It checks the system and identifies problems in different areas of the computer hardware. It usually checks the computer's memory, keyboard, monitor, system processor and hard disk speed.

It is a device which tests the operation of the system as it boots up. It identifies system errors when the system is dead or unable to start from the hard disk or CD.



**Работа в парах. Практикуйтесь в телефонных разговорах, звоните в службу поддержки ИТ, потому что у вас проблема с компьютером.**  
*Example: A: Good morning. How can I help you? B: My name is Bolek and I have a problem with opening a file.*

### **РАЗДЕЛ 3: COMPUTERS TOMORROW / КОМПЬЮТЕРЫ ЗАВТРА**

#### **Практическое занятие № 15. Communication Systems / Системы коммуникации**

**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 УК-4.

**Теоретическая часть:**

## Channels of communication

### What are telecommunications?

**Telecommunications** refers to the transmission of signals over a distance for the purpose of communication. Information is transmitted by devices such as the telephone, radio, television, satellite, or computer networks. Examples could be two people speaking on their **mobile phone**, a sales department sending a **fax** to a client, or even someone reading the **teletext** pages on TV. But in the modern world, telecommunications mainly means transferring information across the **Internet**, via modem, phone lines or wireless networks.

Because of telecommunications, people can now work at home and communicate with their office by computer and telephone. This is called **teleworking**. It has been predicted that about one third of all work could eventually be performed outside the workplace. In **call centres**, assistance or support is given to customers using the telephone, email or online chats. They are also used for **telemarketing**, the process of selling goods and services over the phone.

### Digital TV and radio

In recent years, TV and radio broadcasting has been revolutionized by developments in satellite and digital transmission. **Digital TV** is a way of transmitting pictures by means of digital signals, in contrast to the analogue signals used by traditional TV. Digital TV offers interactive services and **pay multimedia** – that is, it can transmit movies and shows to TV sets or PCs on a pay-per-view basis. It is also **widescreen**, meaning programmes are broadcast in a native 16:9 format instead of the old 4:3

format. Digital TV provides a better quality of picture and sound and allows broadcasters to deliver more channels.

Digital Terrestrial TV is received via a **set-top box**, a device that decodes the signal received through the aerial. New technologies are being devised to allow you to watch TV on your mobile. For example, **DMB (Digital Multimedia Broadcasting)** and **DVB-H (Digital Video Broadcast-Handheld)** can send multimedia (radio, TV and data) to mobile devices.

Audio programs (music, news, sports, etc.) are also transmitted in a digital radio format called **DAB (Digital Audio Broadcasting)**.

### Mobile communications

Thanks to wireless connectivity, mobile phones and **BlackBerrys** now let you check your email, browse the Web and connect with home or company intranets, all without wires.

The use of **GPS** in cars and PDAs is widespread, so you can easily navigate in a foreign city or find the nearest petrol station. In the next few years, GPS chips will be incorporated into most mobile phones.

Another trend is **wearable computers**. Can you imagine wearing a PC on your belt and getting email on your sunglasses? Some devices are equipped with a wireless modem, a keypad and a small screen; others are activated by voice. The users of wearable technology are sometimes even called **cyborgs**! The term was invented by Manfred Clynes and Nathan Kline in 1960 to describe cybernetic organisms – beings that are part robot, part human.

### Вопросы и задания:

Прочитайте и переведите текст «Каналы связи» и найдите следующее:

- 1 the device that allows PCs to communicate over telephone lines
- 2 the practice of working at home and communicating with the office by phone and computer
- 3 the term that refers to the transmission of audio signals (radio) or audiovisual signals (television)
- 4 five advantages of digital TV over traditional analogue TV
- 5 two systems that let you receive multimedia on your mobile phone
- 6 the term that means *without wires*
- 7 devices that deliver email and phone services to users on the move
- 8 the meaning of the term *cyborg*

2. Пометьте фотографии (1-7) с помощью систем и услуг ИКТ: *fax, GPS, Call centre, Digital radio, Teletex, Wearable computer, Digital TV*.





1 \_\_\_\_\_



2 \_\_\_\_\_



3 \_\_\_\_\_



4 \_\_\_\_\_



5 \_\_\_\_\_



6 \_\_\_\_\_



7 \_\_\_\_\_

**3. Работать в парах. Опишите свой мобильный телефон. Используйте эти фразы и вопросы ниже для помощи:**

*My phone is...*

*It's got a...*

*With ..., I can ...*

*The best feature is...*

*I never use ...*

*I mostly use it for...*

- 1 How much money do you spend on your mobile?
- 2 Can you send MMS (multimedia messages) from your mobile?
- 3 Do you access the Internet from your mobile? Which sites do you visit?
- 4 Can you listen to music and watch TV on your mobile?
- 5 Do you use your mobile phone for business? Do you think it is secure to carry out financial transactions via mobile phones?
- 6 Do you ever use your phone while driving?
- 7 Have you ever had to use your phone in an emergency?
- 8 Do you think that prolonged use of mobile phones can affect our health (for example cause fatigue and headaches, emit radiation, excite brain cells, etc.)?

### Практическое занятие № 16. Videogames / Компьютерные игры

**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 УК-4.

### Теоретическая часть:

## Game genres

There are so many different genres and mixes of genres that it's difficult to put each game into a specific category. In the following article we'll cover the basic genres that differentiate between games.

5 The **First-person shooter (FPS)** and **Action** genres are currently the most popular. Games like *Half-Life*, *Halo* and *Call of Duty* are the most popular games in the FPS category. For Action, innovative titles like the *Grand Theft Auto* series, *Gears of War* and *Splinter*

10 *Cell* are huge successes.

The **Role-playing game (RPG)** genre has remained strong throughout the entire history of console and PC gaming. Current hits like *Final Fantasy XII*, *Oblivion* and the *Knights of the Old Republic* series

15 are all based on RPG roots. The recent development of *massively multiplayer online RPGs* has been made possible by widespread broadband access, allowing gamers to play internationally with thousands of people across the globe in a constant virtual world.

20 **Adventure games** and **Puzzle games** remain strong despite being limited in scope and technology. The new concept of *party games* – where people play together in multiplayer mode – has recently injected new life into this genre. Titles like *Zelda* and *Wario-*

25 *Ware* are familiar names.

**Sports games** are an increasingly popular portion of the gaming industry. Electronic Arts (EA) have been making games licensed from the NBA, NFL and MLB for over a decade. Another sector of the Sports

30 industry is the entire racing sub-genre. Massive hits like the *Burnout* and *Need for Speed* series are hugely exciting, and the crashes can be realistic and terrifying.



*Halo 3 is very popular on the Xbox console; millions of people also play the game online*

The **Simulation** genre has enjoyed wild success, including the best-selling PC games of all time: *The Sims* & *The Sims 2*. The entire *Sims* series, designed by Maxis, is dominant in this genre. Jet fighter and flying sims are also important types of simulation game.

35

40 **Strategy** is a genre mainly restricted to PC, largely because the mouse and keyboard are central to gameplay. There are a few good Strategy games for console, however. Big names in Strategy include *Warcraft III*, *Starcraft*, *Command and Conquer* and

45 *Warhammer 40,000*.

Finally, we have the **Fighting** genre. Developed from early hit games like *Street Fighter II*, Fighting games have enjoyed a renaissance as they've been updated fully to include 3-D characters and arenas. Titles

50 like *Dead or Alive*, *Tekken* and *Soul Calibur* are big favourites.

So what kind of game player are you? Chances are that if you're a PC gamer, you prefer FPS, RPG, Simulation, and Strategy games. The console gamer typically enjoys Sports, Racing, Fighting, RPGs, and

55 a few FPS titles. Of course, many people own both a console and a PC, therefore combining the best of both worlds.

### Вопросы и задания:

Прочитайте и переведите текст «Игровые жанры». Все эти утверждения об играх являются ложными, прочитайте текст еще раз и исправьте их:

- 1 Role-playing games are currently the most popular.
- 2 Massively multiplayer online RPGs have been made possible by widespread internet access.
- 3 *Oblivion* is an Action game.
- 4 *The Sims* series is the least popular in the Simulation category.
- 5 Strategy games are mainly restricted to game consoles.
- 6 *Warcraft* belongs to the Fighting genre.
- 7 Console gamers typically prefer Simulation and Strategy games.

Найдите слова в тексте со следующими значениями:



- 1 now; at this time or period (lines 5–10) \_\_\_\_\_
- 2 existing or happening in many places and/or among many people (lines 15–20) \_\_\_\_\_
- 3 in spite of; notwithstanding (lines 20–25) \_\_\_\_\_
- 4 more and more (lines 25–30) \_\_\_\_\_
- 5 a smaller category within a particular genre (lines 30–35) \_\_\_\_\_
- 6 big successes (lines 30–35) \_\_\_\_\_
- 7 sold in very large numbers (lines 35–40) \_\_\_\_\_
- 8 modernized (lines 45–50) \_\_\_\_\_

**3.В парах обсуждаем эти вопросы. Укажите причины своих ответов.**

- 1.What is your favourite and the least favourite genre of game? Why?
- 2.What are your favourite games? Describe them to your partner.

**Плюсы и минусы игр. Посмотрите на утверждения (1-4) об играх и скажите, согласны ли вы с ними или нет.**

- 1 TV and video games are amusing and can be educational. But too much of this kind of entertainment can be addictive and make children become accustomed to violence.
- 2 Massively multiplayer online games are interactive and fun.
- 3 Video games have negative effects on children and distract them from school and homework.
- 4 Modern games and simulations offer a great deal of adventure and challenge. In addition, they can teach skills such as strategic thinking, interpretative analysis and problem solving.

### **Практическое занятие № 17.**

#### **New Technologies / Новые технологии**

**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 УК-4.

**Теоретическая часть:**

**Future trends**

1

By all accounts, **nanotechnology** – the science of making devices from single atoms and molecules – is going to have a huge impact on both business and our daily lives. Nano devices are measured in **nanometres** (one billionth of a metre) and are expected to be used in the following areas.

- **Nanocomputers:** Chip makers will make tiny microprocessors with **nanotransistors**, ranging from 60 to 5 nanometres in size.

- **Nanomedicine:** By 2020, scientists believe that nano-sized robots, or **nanobots**, will be injected into the body's bloodstream to treat diseases at the cellular level.

- **Nanomaterials:** New materials will be made from carbon atoms in the form of **nanotubes**, which are more flexible, resistant and durable than steel or aluminium. They will be incorporated into all kinds of products, for example stain-resistant coatings for clothes and scratch-resistant paints for cars.

2

**Artificial Intelligence (AI)** is the science of making intelligent machines and programs. The term originated in the 1940s, when Alan Turing said: 'A machine has artificial intelligence when there is no discernible difference between the conversation generated by the machine and that of an intelligent person.' A typical AI application is **robotics**. One example is ASIMO, Honda's

intelligent humanoid robot. Soon, engineers will have built different types of **android**, with the form and capabilities of humans. Another AI application is **expert systems** – programs containing everything that an 'expert' knows about a subject. In a few years, doctors will be using expert systems to diagnose illnesses.

3

Imagine you are about to take a holiday in Europe. You walk out to the garage and talk to your car. Recognizing your voice, the car's doors unlock. On the way to the airport, you stop at an ATM. A camera mounted on the bank machine looks you in the eye, recognizes the pattern of your iris and allows you to withdraw cash from your account.

When you enter the airport, a hidden camera compares the digitized image of your face to that of suspected

criminals. At the immigration checkpoint, you swipe a card and place your hand on a small metal surface. The geometry of your hand matches the code on the card, and the gate opens. You're on your way.

Does it sound futuristic? Well, the future is here. **Biometrics** uses computer technology to identify people based on physical characteristics such as fingerprints, facial features, voice, iris and retina patterns.

*Adapted from the Richmond Times-Dispatch*

4

**Ubiquitous computing**, also known as **pervasive computing**, is a new approach in which computer functions are integrated into everyday life, often in an invisible way. **Ubiquitous devices** can be anything from smartphones to tiny sensors in homes, offices and cars, connected to networks, which allow information

to be accessed anytime and anywhere – in other words, ubiquitously. In the future people will interact naturally with hundreds of these **smart devices** (objects containing a microchip and memory) every day, each invisibly **embedded** in our environment and communicating with each other without cables.

5

In the ideal **smart home**, **appliances** and electronic devices work in sync to keep the house secure. For example, when a regular alarm system senses that someone is breaking into the house, it usually alerts the alarm company and then the police. A smart home system would go further, turning on the lights in the home and then sending a text message to the owner's phone. Motorola *Homesight* even sends images captured by wireless cameras to phones and PCs.

Smart homes can remember your living patterns, so if you like to listen to some classical music when you come home from work, your house can do that for you automatically. They will also know when the house is empty and make sure all appliances are turned off. All home devices will be interconnected over a home area network where phones, cable services, home cinemas, touch screens, smart mirrors and even the refrigerator will cooperate to make our lives more comfortable.

*Adapted from [www.businessweek.com](http://www.businessweek.com)*

## Вопросы и задания:

Прочитайте и переведите текст «Будущие тренды». Ответьте на эти вопросы:

- 1 Which unit of measurement is used in nanotechnology?
- 2 What are the advantages of nanotubes over regular materials?
- 3 What will doctors use *expert systems* for?
- 4 What features are analysed by biometrics?
- 5 Which trend refers to computers embedded in everyday devices, communicating with each other over wireless networks?
- 6 What will the alarm system do if someone breaks into a smart home?
- 7 How will devices be interconnected inside the smart home?

**2. Напишите слова в тексте со следующими значениями:**

- 1 a microscopic robot, built with nanotechnology (text 1) \_\_\_\_\_
- 2 a robot that resembles a human (text 2) \_\_\_\_\_
- 3 biological identification of a person (text 3) \_\_\_\_\_
- 4 integrated; inserted into (text 4) \_\_\_\_\_
- 5 electrical devices, or machines, used in the home (text 5) \_\_\_\_\_

**3. В парах обсудим эти прогнозы. Ты согласен или несогласен? Укажите свои причины.**

1. Some day, we'll be talking to computers naturally, like friends.

Microchips implanted in our arms will serve like ID card and contain our medical records.

Robots will learn to build themselves, without human help.

Smart homes will be voice activated.

Computers will be ubiquitous and almost invisible, embedded into our homes and into our lives.

**Практическое занятие № 18.  
Computer Tomorrow/ Основные части 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 УК-4.

**Теоретическая часть:**

**Artificial Intelligence** is a branch of *Science* which deals with helping machines find solutions to complex problems in a more human-like fashion. This generally involves *borrowing* characteristics from human intelligence, and *applying* them as algorithms in a computer friendly way. A more or less flexible or efficient approach can be taken depending on the requirements established, which influences how artificial the intelligent behavior appears.

**Вопросы задания:**

**Переведите:**

Discuss the following quotations. Imagine you could talk to the people quoted. Explain how wrong their predictions were, using evidence from today's world.

<p>The telephone has too many shortcomings to be seriously considered as a means of communication. The device is inherently of no value to us.</p> <p><i>Western Union internal memo 1876</i></p>	<p>The wireless music box has no imaginable commercial value.</p> <p><i>Business response to appeal for investment in radio during the 1920s</i></p>
<p>Television will never be a serious competitor for radio because people must sit and keep their eyes glued to a screen; the average American family hasn't time for it.</p> <p><i>The New York Times, 1939</i></p>	<p>I think there is a world market for maybe five computers.</p> <p><i>Thomas Watson, chairman of IBM, 1943</i></p>

What do you think has been the greatest advance in communications in last ten years? Group work:

Work in a group of three and make your predictions about the future development in different IT areas. Each group will take one area.

- television
- radio
- telephone
- computer

**Прочитайте:**

- Have you heard about the Artificial intelligence? - What is it? Make a definition of it.
- Compare your definition with the one below. - What are the differences?
- Why do people need AI?
- What are the limitations of AI?
- What are the applications of the AI?



Read the article about the present level of development of AI and compare your ideas.

**Predicting the future is always a hit and miss proposition** writes Kevin Anderson.

In the 1940s, Thomas Watson, the head of IBM, famously predicted the world demand for computers might be as high as five. And artificial intelligence has had its share of *off-target predictions*. AI researchers in the 1950s predicted that a computer would be the world chess Champion by 1968. It took a few more decades than that. But AI experts remain optimistic and are predicting that by the middle of the century, intelligent machines will be all around us.

**AI is everywhere**

In fact, they point out that artificial intelligence already *pervades* our lives. Machines will gradually become more intelligent and become more *pervasive*. Fuel injection systems in our cars use learning algorithms. Jet turbines are redesigned using genetic algorithms, which are both examples of AI, says Dr. Rodney Brooks, the director of MIT's artificial intelligence laboratory. Every cell phone call and e-mail is routed using artificial intelligence, says Ray Kurzweil, an AI entrepreneur and the author of two books on the subject, *The Age of Intelligent Machines* and *The Age of Spiritual Machines*. "We have hundreds of examples of what I call narrow AI, which is behavior that used to require an intelligent adult but that can now be done by a computer," Mr. Kurzweil says. "It is narrow because it is within a specific domain, but the actual narrowness is gradually getting a bit broader," he adds.

### **The near future**

Right now, Dr. Brooks says that artificial intelligence is about at the same place the personal computer industry was in 1978. In 1978, the Apple II was a year old and Atari had just introduced the 400 and 800. The choice of personal computers was pretty limited and what they could do was also relatively limited by today's standards. "Who would have thought by 2001, you would have four computers in your kitchen?" said Dr. Rodney Brooks, director MIT AI Lab.

The metaphor may *undersell* AI's successes. AI already is used in pretty advanced applications including helping with flight scheduling or reading X-rays. Within 30 years, scientists believe that they will have an understanding of how the human brain works that will give them *templates* of intelligence for developing strong AI. And Dr. Brooks says that by 2050, our lives will be populated with all kinds of intelligent robots. Sounds *outlandish*? "Who would have thought by 2001, you would have four computers in your kitchen," he says, pointing to the computer chips in our coffee makers, refrigerators, stoves and radios.

### **Gradual change**

But will our hyper-intelligent coffee makers in 2050 suddenly decide to kill us? Or will humans be made redundant by a legion of intelligent machines? A scientist does not just wake up and decide to build a robot with emotions, Dr. Brooks says. No. Firstly, Dr. Brooks and Mr. Kurzweil believe that we will not wake up one day to find our lives populated with all manner of artificially intelligent devices. Referring to Spielberg's movie AI in which a company creates a robot that bonds emotionally like a child, Dr. Brooks says: "A scientist doesn't wake up one day and decide to make a robot with emotions." Despite the rapid advance of technology, the *advent* of strong AI will be a gradual process, they say. "The road from here to there is through thousands of these benign steps," Mr. Kurzweil says. Look through the article once again and extend these ideas (give examples from the text)

AI has already become a part of our life.

AI has a vast future ahead.

AI is not well developed yet.

Creating of AI is a tedious process.

### **Словарный запас:**

Find words in the article which mean: *a sample of intelligence, to penetrate in our world, invalid forecast, widespread, AI arrival, It is incredible, to underestimate the success*

Read these expressions and try to put them into the appropriate column of the table to speak about:

The benefits of AI the downsides of

AI *To take over our lives*

*To encourage progress*

*To limit freedom*

*To misuse data*

*To supersede people*

*To increase life expectancy*

*To enhance productivity*

Try to continue this table in pairs

### **Работа в интернете:**

Look through the Internet and find the information about the advantages and disadvantages of AI development. Get ready to participate in group discussion.

Discussion:

Group1: For the development of AI.

Group2: Against the AI development.

Chairman: Leads the discussion and prepares questions.

Discuss these problems in groups:

Do people really need AI?

Can machines be creative?

How intelligent are human beings?

Can machines match the reality?

Is AI a friend or an enemy?

#### **РАЗДЕЛ 4. THE FUNCTIONAL ORGANIZATION OF A COMPUTER / ФУНКЦИОНАЛЬНОЕ УСТРОЙСТВО КОМПЬЮТЕРА**

##### **Практическое занятие № 19.**

##### **Computer Essentials / Основные части 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 УК-4.

##### **Теоретическая часть:**



## What is a computer?

A computer is an electronic machine which can accept data in a certain form, process the data, and give the results of the processing in a specified format as information.

First, data is fed into the computer's memory. Then, when the program is run, the computer performs a set of instructions and processes the data. Finally, we can see the results (the output) on the screen or in printed form (see Fig. 1 below).

A computer system consists of two parts: hardware and software. **Hardware** is any electronic or mechanical part you can see or touch. **Software** is a set of instructions, called a program, which tells the computer what to do. There are three basic hardware sections: the **central processing unit (CPU)**, **main memory** and **peripherals**.

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

**Storage devices** (hard drives, DVD drives or flash drives) provide a permanent storage of both data and programs.

**Disk drives** are used to read and write data on disks.

**Input devices** enable data to go into the computer's memory. The most common input devices are the

**mouse** and the **keyboard**. **Output devices** enable us to extract the finished product from the system.

For example, the computer shows the output on the **monitor** or prints the results onto paper by means of a **printer**.

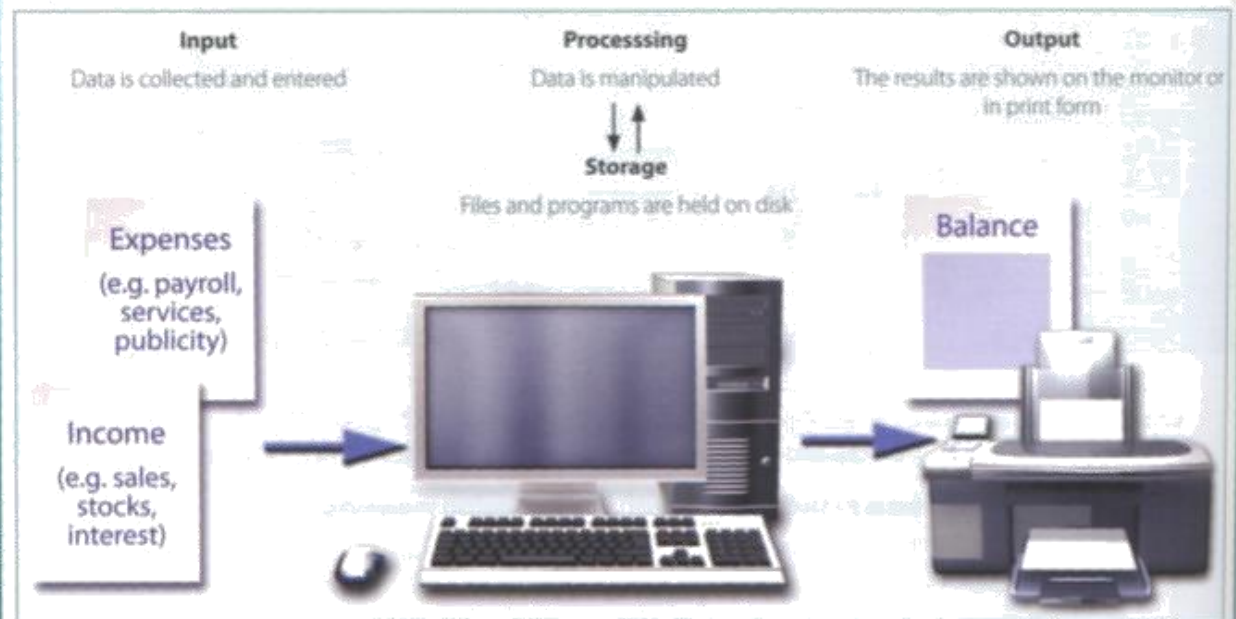
On the rear panel of the computer there are several **ports** into which we can plug a wide range of peripherals – a modem, a digital camera, a scanner, etc. They allow communication between the computer and the devices. Modern desktop PCs have USB ports and memory card readers on the front panel.



A USB port



A USB connector



### Вопросыизадания:

Прочитайте текст «Что такое компьютер? », Переводит это. Составьте краткое устное резюме текста (5-7 предложений).

2.Найдите название элемента этой компьютерной системы в тексте «Что такое компьютер?».

**B** In pairs, label the elements of this computer system.



Сопоставьте эти слова из текста (1-9) с правильными значениями (a-i).

- |  |   |
|--|---|
| 1 software                             | a the brain of the computer   |
| 2 peripherals                          | b physical parts that make up a computer system                             |
| 3 main memory                          | c programs which can be used on a particular computer system                |
| 4 hard drive (also known as hard disk) | d the information which is presented to the computer                        |
| 5 hardware                             | e results produced by a computer  |
| 6 input                                | f input devices attached to the CPU   |
| 7 ports                                | g section that holds programs and data while they are executed or processed |
| 8 output                               | h magnetic device used to store information                                 |
| 9 central processing unit (CPU)        | i sockets into which an external device may be connected                    |

**Работать в парах. Составьте список сокращений. Спрашивать и отвечать на вопросы.**

*Example: A: What does HTML stand for/mean?*

*B: It stands for/means....*

### Практическое занятие № 20. InsidetheSystem / Внутренняя система 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 УК-4.



## **Теоретическая часть:**

### **What is inside a PC system?**

A computer is made up of different components like the motherboard, processor, display, RAM, etc. Each component has to do its own set of jobs in coordination with other components to make the computer work correctly. Let's see what are the internal components of a computer.

#### **Motherboard**

The basic building block of a computer, whether it's a laptop or a desktop, is a green colored printed circuit board called Motherboard. All the other components are connected to it and use various circuits and interfaces to communicate with each other. For a desktop computer, you only have to open one screw in order to gain access to what is inside the computer. But for a laptop computer, it's tedious and frightening job. Motherboard houses various components like memory slots, sockets, chipset, clock generator, expansion slots, storage connectors, etc.

#### **Processor**

You might have heard it an uncountable number of times that a processor or a CPU (Central Processing Unit) is the brain of a computer. Often, in the case of desktops, people confuse the CPU with the cabinet. But it's a small chip placed on the socket of the motherboard and is responsible for all the calculations and input/output operations to be done in order to process the data. Modern computers have small-sized CPU chips known as Microprocessors.

A microprocessor houses the two components of a processor, processing unit and the control unit, on a single small IC. Modern microprocessors come as single core or multi-core. A multi-core microprocessor such as the Intel Core i7, have more than one processing units (cores) present on a single chip.

The basic task a processor has to perform can be divided into three categories:

- It gathers the necessary program data to be processed. For this, the data is first shifted from the hard drive to the RAM of the computer then to the CPU.
- The CPU then processes the data on the basis of some rules and regulations, known as Instruction Set, it already knows.
- Finally, the processed data is ready. It then follows the steps the programmer has included in the program. For example, the processed data can be displayed on the screen or saved to the hard drive.

#### **Cache**

It is a memory supplement used by the CPU while it's busy with the processing jobs. Cache memory contains the data which is often required by a CPU like the program instructions. It is easier for the CPU access the cache memory first than going for the larger ones. Cache memory is way faster than RAMs and hence it's costlier. So, the size of the cache memory is kept very limited.

The cache memory is present on the CPU chip itself.

Cache memory comes in levels like L1 cache, L2 cache, and L3 cache. The CPU first searches for the required data in L1, then L2, then L3, and L4 if it exists. Finally, if none of the cache memories are able to provide the required data, it will access the RAM. Cache memory is very vital to a computer. A computer with a faster processor and less cache will perform worse than a slower processor with more cache. But this doesn't mean that a 20-year-old processor puffed with excess cache could outperform a present-day processor.

#### **RAM**

Random Access Memory is one of the vital parts of a computer. If you take out the RAM chip out of your computer, it won't start. It is faster than the hard drives and is used to store program data which is currently used by the CPU. But RAM suffers from short-term memory loss. What does it mean? It holds data only when it receives power. Once you turn off your computer all the data will be lost. That's the reason it can't be used as a permanent storage solution in a computer.

The RAM chips we use on our laptop and desktops differ in size. The reason is to make the memory chip compact for the laptops. But they have the same functionality and powers. Dynamic RAM integrated circuits, known as Dual-Inline Memory Module (DIMM), are mounted on green colored PCB and then called as DIMM chips. Memory variants like DDR, DDR2, DDR3, DDR4, etc. differ in the number of pin counts they have.

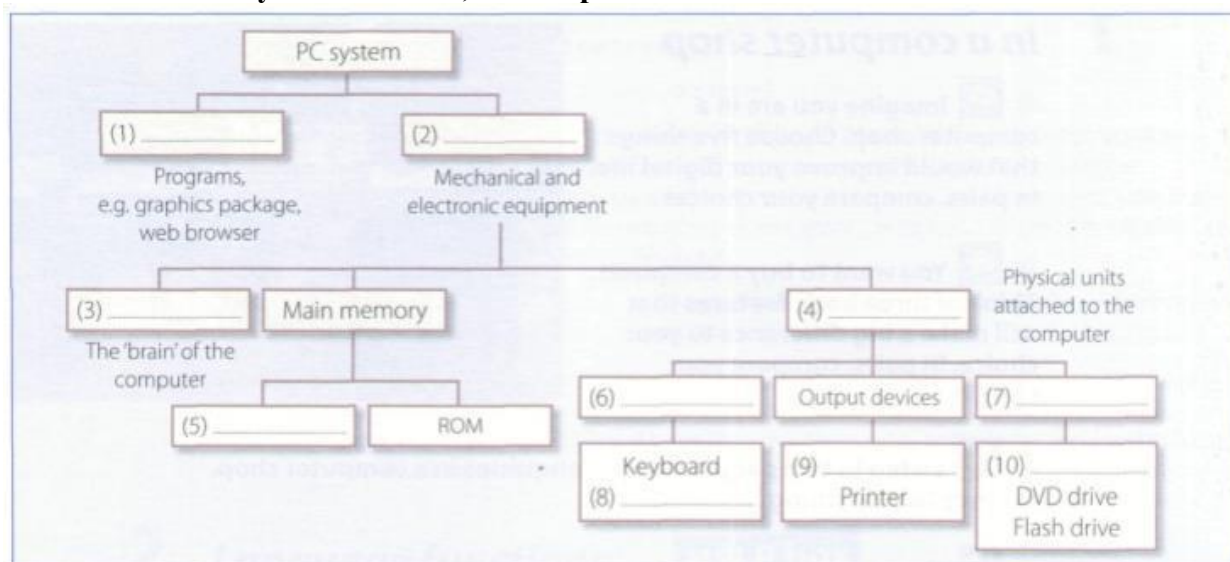
Before DIMMs, SIMMs used to exist. The key difference between the two is the number of pin counts. SIMMs have half the number of pins than DIMMs. However, the number of pins will appear the same if you take a casual look on them. A keen observation would lead to a conclusion that the pins on either side of a SIMM are connected to each other which is not the case with DIMM.

Also, the SIMM supports a 32-bit data bus while DIMM supports 64-bit data bus. This allows the flow of more data in the case of DIMM. The modern 64-bit CPUs would require an installation of two SIMMs chips. A single DIMM would be sufficient for that. Hence, the SIMMs became obsolete with time.

### Вопросыизадания:

**Прочитайте и переведите текст «Что находится внутри системы ПК?», Дайте свои определения терминам: motherboard, RAM, CPU, cache memory, processing unit, control unit, DIMM.**

**Заполните схему системы ПК, посмотрите в тексте для помощи.**



**Сопоставьте половину предложения 1-8 с a-h.**

Hanka is creating a) the software.

Philip is inserting an d) a check-up.

Rob is troubleshooting c) a file.

We are running d) a device.

Betty is connecting e) CDs.

They are burning f) image.

**Напишите три предложения, в которых говорится о том, что вы и ваши коллеги делаете в данный момент в своей работе или учебе. Используйте настоящее непрерывно.**

**Работа в группе из 3-4 студентов. Составьте список всего компьютерного оборудования, которое вы используете в своей работе или учебе.**

**Практическое занятие № 21.  
Computerhardware / Жёсткий диск**

**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 УК-4.

### **Теоретическая часть:**

#### **Computer Hardware**

Computer hardware is the physical components that a computer system requires to function. It encompasses everything with a circuit board that operates within a PC or laptop; including the motherboard, graphics card, CPU (Central Processing Unit), ventilation fans, webcam, power supply, and so on.

Although the design of hardware differs between desktop PCs and laptops due to their differences in size, the same core components will be found in both. Without hardware, there would be no way of running the essential software that makes computers so useful. Software is defined as the virtual programs that run on your computer; that is, operating system, internet browser, word-processing documents, etc.

Although a computer can function only when both hardware and software are working together, the speed of a system will largely rely on the hardware used.

When building up a new computer, or simply replacing old parts, you may need to know the specific hardware in your computer. The purpose of this guide is therefore to help you understand the inner-workings of your computer.

#### **Hard Drive**

The hard drive is a storage device responsible for storing permanent and temporary data. This data comes in many different forms, but is essentially anything saved or installed to a computer: for example, computer programs, family photos, operating system, word-processing documents, and so on.

There are two different types of storage devices: the traditional hard disk drive (HDD) and the newer solid state drives (SSD). Hard disk drives work by writing binary data onto spinning magnetic disks called platters that rotate at high speeds, while a solid-state drive stores data by using static flash memory chips.

#### **Graphics Processing Unit (GPU)**

Especially important for 3D rendering, the GPU does exactly what its name suggests and processes huge batches of graphic data. You will find that your computer's graphics card has at least one GPU. As opposed to the basic on-board graphic capabilities that PC motherboards supply, dedicated graphics cards interface with the motherboard via an expansion slot to work almost exclusively on graphic rendering. This also means you can upgrade your graphics card if you want to get a bit more performance from your PC.

Not only this, but modern GPUs fulfil a broad computational workload beyond just rendering, making them an extension to the central processing unit.

#### **Power Supply Unit (PSU)**

A power supply unit, commonly abbreviated as PSU, does more than just supply your computer with power. It is the point where power enters your system from an external power source and is then allocated by the motherboard to individual component hardware. Not all power supplies are made equally however, and without the right wattage PSU your system will fail to work.

A modern computer will generally need a PSU that's rated between 500W – 850W to effectively power all hardware, although the size of the PSU will depend entirely on the power consumption of the system. Computers that are used for highly intensive tasks such as graphic design or gaming will require more powerful components and thus will need a bigger PSU to cater to this additional need.

Without the right amount of power, components won't be able to run effectively and the computer might experience crashes or simply fail to boot at all. It's recommended to have a power supply that more than covers your system usage. Not only do you guard yourself against system failure, you also future-proof yourself against needing a new PSU when you upgrade to more powerful PC components.

Understanding your computer and its hardware components can prove very useful when the time comes to upgrade or replace any parts, or when building a computer. Should a problem arise with the internal workings of your computer, you will have a better understanding of the importance of each component, the need for them to be in good working condition and how to go about solving any issues.

#### **Вопросы и задания:**

**Прочитайте и переведите текст «Компьютерное оборудование». Ответьте на эти**

#### **вопросы:**

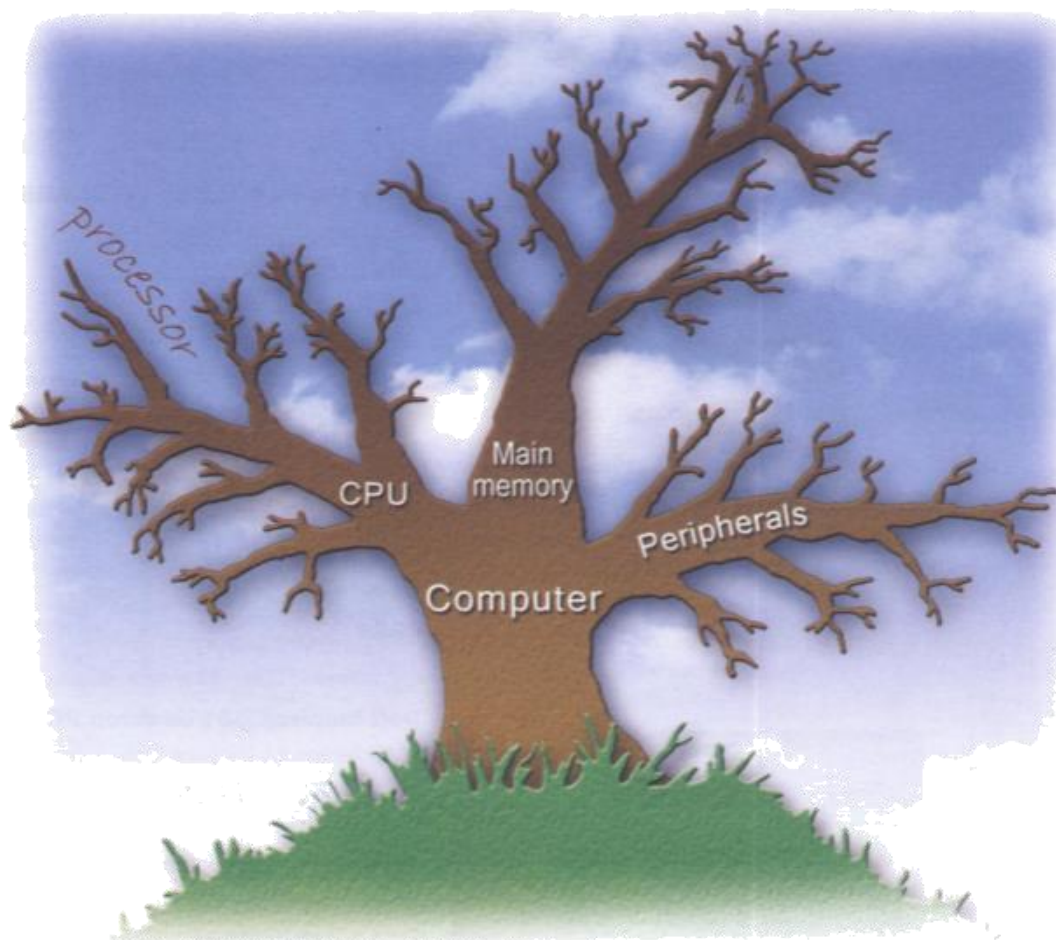
- What does RAM stand for?
- What is the main function of computer's processor?
- What are the main parts of CPU?
- What does GPU stand for?

**2.Прочитайте рекламу и переведите и переведите техническую спецификацию на русский язык:**



**Посмотрите на список терминов в поле и поместите каждый в соответствующем месте на дереве слов ниже. Первый был сделан для вас.**

processor	ROM	expandable memory	ALU	DIMMs	hard drive
RAM	computer brain	byte	DVD	system clock	keyboard
mouse	gigahertz	printer	megabyte	webcam	registers



Друг попросил вас порекомендовать ему компьютер, который соответствует его потребностям. Он должен иметь доступ к Интернету, играть в игры и работать с графикой, музыкой и видеофайлами. Напишите электронное письмо с описанием его технических характеристик и указанием, почему вы его рекомендуете.

## Практическое занятие № 22. Storage Devices. Magnetic Storage / Устройства хранения информации. Магнитные носители

**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 УК-4.

### Теоретическая часть:

## Magnetic storage

Magnetic storage devices store data by magnetizing **particles** on a disk or tape.

A **floppy disk** is so called because it consists of a flexible sheet of plastic, coated with iron oxide – a magnetizable material. A floppy disk drive spins at 360 revolutions per minute (rpm), so it's relatively slow. However, a **hard drive** spins at over 7,200 rpm and stores data on a stack of metal rotating disks called **platters**. This means you can store much more data and retrieve information much faster.



The inside of a hard drive

New disks need to be **formatted** before you can use them, unless they come preformatted from the manufacturer. When the disk is formatted, the operating system (OS) organizes the disk surface into circular **tracks** and divides each track into **sectors**. The OS creates a **directory** which will record the specific location of files. When you save a file, the OS moves the **read/write head** of the drive towards empty sectors, records the data and writes an entry for the directory. Later on, when you open that file, the OS looks for its entry in the directory, moves the read/write heads to the correct sector, and reads the file in the RAM area. However, formatting erases any existing files on a disk, so do not format disks on which data that you don't want to lose is stored.



Fig. 1

The OS allows you to create one or more **partitions** on your hard drive, in effect dividing it into several logical parts. Partitions let you install more than one operating system (e.g. Windows and Linux) on your computer. You may also decide to split your hard drive because you want to store the OS and programs on one partition and your data files on another; this allows you to reinstall the OS when a problem occurs, without affecting the data partition.

The average time required for the read/write heads to move and find data is called **seek time** (or **access time**) and it is measured in milliseconds (ms); most hard drives have a seek time of 7 to 14 ms. Don't confuse this with **transfer rate** – the average speed required to transmit data from the disk to the CPU, measured in megabytes per second.



Toshiba's 1.8" hard drive; mini hard drives are used in small gadgets, such as PDAs and wristwatches

### How to protect your hard drive

- Don't hit or move the computer while the hard drive is spinning. Hard drives are very sensitive to vibration and shocks, especially when they are operating; when the read/write head touches the rotating disk, it can scratch and damage the disk surface. This is known as **head crash**.
- You shouldn't turn your computer off and on quickly. Wait at least ten seconds to ensure that the drive has stopped spinning.
- Check your hard drive regularly for logical and physical errors. To check and repair a drive, you can use a disk diagnosis utility like Windows ScanDisk.
- To minimize the risk of data loss or corruption, you should install an up-to-date virus scanner. You should also **back up** your hard drive regularly.

### Вопросы и задания:

#### 1. Прочитайте и переведите текст «Магнитное хранилище».

Прочитайте текст еще раз и решите, являются ли эти предложения истинными или ложными. Исправьте ложные предложения:

A hard drive spins at the same speed as a floppy disc drive.

If you format a hard drive that has files on it, the files will be deleted.

Hard drives cannot be partitioned to run separate operating systems on the same disc.

Seek time and transfer rate mean the same thing.

Disk drives are not shock resistant, especially in operating mode.

Дополните предложения словами из коробки.

- 1 There are basically three types of magnetic \_\_\_\_\_ device available to the computer user – hard drives, diskettes and tapes.
- 2 The \_\_\_\_\_ of a 3.5" floppy disk is only 1.44MB.
- 3 Hard drives can \_\_\_\_\_ hundreds of times more data than floppy disks.
- 4 A portable hard drive is a good choice for \_\_\_\_\_ storage.
- 5 Magnetic tapes are used for \_\_\_\_\_ information that you no longer need to use regularly.

**Меры предосторожности. Сопоставьте инструкции (1-6) с рисунками (a-f).**

Do not expose discs to the heat or direct sunlight.

Check for viruses before opening the files you receive from the Web or via email.

Make backup copies of your files.

Don't shake or move your computer violently while your hard drive is spinning.

Keep your discs away from water and humidity.

Hold discs by the edges or by one edge and the center hole.



**Практическое занятие № 23.**

**Storage Devices. Optical Storage / Устройства хранения информации.  
Оптические носители**

**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 УК-4.

### **Теоретическая часть:**

#### **Optical Disk Drive**

An **optical disk drive (ODD)** uses a laser light to read data from or write data to an optical disc. These include CDs, DVDs, and Blu-ray discs. This allows you to play music or watch movies using pre-recorded discs. Computer software also often comes on one of these discs, so you need an optical drive to install software. Most modern drives allow you to write to an empty disc, so you can create your own music CDs or create a backup copy of important data.

#### **Components**

An optical disk drive uses a laser to read and write data. A laser in this context means an electromagnetic wave with a very specific wavelength within or near the visible light spectrum. Different types of discs require different wavelengths. For compact discs, or CDs, a wavelength of 780 nanometers (nm) is used, which is in the infrared range. For digital video discs, or DVDs, a wavelength of 650 nm (red) is used, while for Blu-ray discs a wavelength of 405 nm (violet) is used.

An optical drive that can work with multiple types of discs will therefore contain multiple lasers. The mechanism to read and write data consists of a laser, a lens to guide the laser beam, and photodiodes to detect the light reflection from the disc.

The optical mechanisms for reading CDs and DVDs are quite similar, so the same lens can be used for both types of discs. The mechanism for reading Blu-ray discs, however, is quite different. An optical drive that works with all types of discs will therefore have two separate lenses: one for CD/DVD and one for Blu-ray.

In addition to the lens, an optical drive has a rotational mechanism to spin the disc. Optical drives were originally designed to work at a constant linear velocity (CLV) - this means that the disc spins at varying speeds depending on where the laser beam is reading, so the spiral groove of the disc passes by the laser at a constant speed. This means that a disc spins at around 200 rotations per minute (rpm) when the laser is reading near the outer rim of the disc and at around 500 rpm when reading near the inner rim.

This constant speed is very important for music CDs and movie discs, since you want to listen to music or watch a movie at the regular speed. For other applications, however, such as reading or writing other types of data, working at this speed is not needed. Modern optical drives can often spin much faster, which results in higher transfer speeds. When you see an optical drive reported as a 4x drive, for example, this means it can spin at four times the base speed (i.e., between 800 and 2,000 rpm).

An optical drive also needs a loading mechanism. Two general types are in use:

- A tray-loading mechanism, where the disc is placed onto a motorized tray, which moves in and out of the computer case.

- A slot-loading mechanism, where the disc is slid into a slot and motorized rollers are used to move the disc in and out.

Tray-loading mechanisms for optical drives in desktop computers tend to be rather bulky.

For laptops, the tray-loading mechanism is much smaller.





*Typical tray-loading optical drive for laptop computers*

### Different Types of Discs

The earliest optical disc used in computer systems was the CD. This allowed you to play regular music CDs on your computer. Specifically, for use in computers, however, CD-ROMs (Compact Disc Read-Only Memory) were developed. These are like regular CDs but contain read-only media, such as data files or software.

The CD-ROM became a widely used method to distribute software. Since the optical drives were used only for CDs, it was often called a CD-ROM drive. The maximum storage capacity of a typical CD-ROM is around 700 MB.

The next type of optical disc that came on the market was the DVD. Intended initially for movies, they were quickly adopted in computer systems as well. The standard capacity of a DVD is 4.7 GB. More recently, Blu-ray discs came on the market and have a standard capacity of 25 GB. Both DVD and Blu-ray also exist in a double layer (DL) format, which effectively doubles their capacity.

### Вопросы и задания:

#### 1. Прочитайте и переведите текст «Оптический дисковод». Ответь на вопросы:

What do CD and DVD stand for?

What is the main advantage of using DVDs instead of CDs?

What are pros and cons of optical discs and magnetic discs?

**Переведите слова и выражения на русский язык, составьте свои предложения, используя эти слова и выражения.:**

Optical disc, laser beam, backward-compatible, read-only media, constant speed, wavelength, tray-loading mechanism, slot-loading mechanism.

**Посмотрите на выдержки из текста и поместите слова, выделенные курсивом, в правый столбец таблицы**

- 1 They are *therefore* ideal for multimedia applications ...
- 2 Furthermore, optical discs are not affected by magnetic fields.
- 3 However, they are very different in internal structure and data capacity.
- 4 As a result, a CD can hold 650–700MB, *whereas* a basic DVD can hold 4.7GB.
- 5 In addition, a DVD can be double-sided and dual layer ...

Indicating addition	Making contrasts	Explaining the results or effects of something

#### 4. Choose the correct word in brackets to complete the sentences.

- 1 (Although/Consequently) CDs and DVDs are similar in size and shape, their data structure is very different.
- 2 DVDs hold more data than CDs. The pits burnt into the disc are smaller than on a CD, and the tracks are closer together. (On the other hand / As a result), DVDs can have up to four recording layers.
- 3 A Blu-ray disc drive costs a lot of money (but/so) you should use it carefully.
- 4 Blu-ray is expected to replace DVD over the coming years (because/besides) it offers much greater storage capacity.
- 5 Both Blu-ray (and / in addition) HD-DVD devices are backward-compatible with current CDs and DVDs, meaning you can play your old discs on the new players.
- 6 Sony has invested millions of dollars in the development of Blu-ray technology. The success of Blu-ray is (whereas/ therefore) vital for the company's future.

### Практическое занятие № 24. 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 УК-4.

### Теоретическая часть:

#### **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 we speak 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.

*Characters*, which are all written language symbols: letters, numbers, and special symbols.

*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**

data processing ['deɪtəprəʊ'sesiŋ] — обработка информации (данных) to convert  
[kən'veɪ:t] — преобразовывать; переводить (в др. единицы) to accomplish  
[ə'kɒmplɪʃ] — завершать, заканчивать; осуществлять, выполнять. to house  
['haʊs] — помещать, размещать  
to improve [ɪm'pru:v] — улучшать, совершенствовать  
to control [kən'trəʊl] — управлять, регулировать; управление, регулирование  
to store ['stɔ:] — хранить, запоминать, заносить (размещать) в памяти  
storage ['stɔ:ndʒ] — запоминающее устройство, память; хранение resource  
[rɪ'sɔ:s] — ресурс; средство; возможность  
facility [fə'sɪlɪti] — устройство; средство  
facilities — приспособления; возможности  
equipment [i'kwɪpmənt] — оборудование; аппаратура; приборы;  
устройства available [ə'veɪəbl] — доступный; имеющийся (в наличии);  
возможный display [dɪs'pleɪ] — дисплей; устройство (визуального)  
отображения; показ manner ['mænə] — способ, образ (действий)  
sequence ['sɪkwəns] — последовательность, порядок (следования)  
successively [sək'sesɪvli] — последовательно  
data storage hierarchy [haɪə'ra:ki] — иерархия (последовательность) запоминания  
информации (данных)  
to enter ['entə] — входить; вводить (данные); заносить, записывать  
comprehensive groupings — полные, обширные, универсальные образования  
meaningful ['mi:nɪŋfʊl] — имеющий смысл; значащий (о данных)  
item ['aɪtəm] — элемент; составная часть  
record ['rekɔ:d] — запись, регистрация; записывать, регистрировать

file ['faɪl] — файл; заносить (хранить) в файл  
 set — набор; множество; совокупность; серия; группа;  
 система database ['deɪtə 'beɪs] — баз данных  
 related [rɪ'leɪtɪd] — смежный; взаимосвязанный; относящийся (к ч.-л.)

### Вопросы и задания:

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

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?

### Найдите в тексте английские эквиваленты следующих словосочетаний:

Системы обработки информации; определение (термина) обработки данных; совокупность фактов; последовательность действий; преобразование входных данных 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 ин-формацию 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.

### Переведите следующие цепочки существительных:

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.  
 Char acterséquence; instruction séquence; message séquence; pulse séquence.  
 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.

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

- |                       |  |
|-----------------------|--|
| 1. Computer           | a) the set of instructions that direct the operations of computers;  |
| 2. Computer literacy  | b) a part of a computer, entering data into the device;  |
| 3. A program          | c) facts unorganized but able to be organized;   |
| 4. Data               | d) the output of a data processing system;   |
| 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;                                   |
| 7. Input              | g) an electronic device performing calculations on numerical data;   |
| 8. Output             | h) an electronic device accepting the 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. |

### Проанализируйте личные формы глагола и правильно переведите предложения.

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 should be coded into ones and zeroes. 8. Processing is operations on data to convert them into useful information. 9. The first machines designed to manipulate punched card data were widely used for business data processing. 10. Hollerith built one machine to punch the holes and the other to tabulate the collected data.

**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.

*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.

*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 data, called a corporate data base, from their personal microcomputer work stations.

*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.

*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, выполняемый вручную

to take advantage of sth — воспользоваться ст.

capability ['keɪpə'bɪlɪ] — способность; возможность; характеристика

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

correctly [kə'rektli] — правильно; верно

to eliminate [e'limineɪt] — устранять; удалять; отменять;

ликвидировать to make errors ['erəz] — допускать ошибки

(погрешности) error-prone — подверженный ошибкам

to remain vulnerable [rɪ'meɪn 'vʌlnərəbl] — оставаться уязвимым, чувствительным

invalid data [ɪn'vəlɪd] — неверные, неправильные, недопустимые данные

communications networks — сети передачи данных; сети связи

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

instant response ['ɪnstəntɪ'spɒns] — мгновенный ответ

(реакция) to respond [rɪ'spɒnd] — отвечать; реагировать

access ['æksəs] — доступ; обращение; обращаться, иметь доступ  
 capacity of storage [kə'pæsɪtɪv 'stɒndʒ] — объем (емкость) памяти  
 to retrieve [ri'tri:v] — извлекать, выбирать (данные); восстанавливать (файл)  
 value ['vælju] — значение; величина; значимость; ценность; оценка; оценивать  
 objective [əb'dʒektɪv] — цель; требование; целевая функция  
 cost-effective ['kɒstɪ'fektɪv] — экономичный; экономически оправданный  
 challenge ['tʃælɪndʒ] — трудность; препятствие; представлять трудность

### Ответьте на вопросы, используя информацию текста.

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?

### 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,

### 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.

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

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-controlled 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.

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.

### Подберите вместо пропусков подходящее по смыслу слово.

Computer data .....system frees humans from routine error-prone tasks.  
 counting; b) computing; c), processing

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

The entered data can be transmitted by \_\_\_\_ networks.  
 communications ; b) conversions; c) procession

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

5. Computer data processing systems can ..... at a fraction of a second.  
receive; b) respond; c) retrieve  
Computer systems are vulnerable to the entry of \_\_\_ .....data.  
invalid; b) invariable; c) invisible
7. As soon as data were entered into the system correctly, the human ..... is limited.  
computation; b) information; manipulation  
The amount of data stored on magnetic discs is constantly .....  
decreasing; b) increasing; c) eliminating

**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 № 25. Computer System Architecture / 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 УК-4.

#### Теоретическая часть: Computer System Architecture

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 centers of these systems, which will be small digital computers.

## Vocabulary

architecture ['a:ki'tektʃə] — архитектура; структура  
architect ['a:kitekt] — разработчик архитектуры (системы, структуры) unit  
['ju:nit] — устройство; модуль; блок; элемент; составная часть  
accessory equipment [æk'sesəri] — вспомогательные устройства  
engineering background ['bækgraund] — техническая подготовка,  
квалификация analyst ['ænəlist] — аналитик; системный разработчик  
product line — серия (компьютерных) продуктов  
manufacturer ['mænju'fæktʃərə] — изготовитель; производитель; разработчик  
application programmer [æpli'keɪʃnprəu'græmə] — прикладной программист  
to simulate ['simjuleit] — моделировать; имитировать  
voltage ['vɒltidʒ] — напряжение  
pressure ['preʃə] — давление, сжатие  
digital computer ['dɪdʒɪtəl kəm'pjʊ:tə] — цифровой компьютер  
hybrid computer ['haɪbrɪd] — смешанного типа, аналого-цифровой  
компьютер discrete [dis'kri:t] — дискретный; отдельный  
continuous quantity [kən'tɪnjuəs 'kwɒntəti] — непрерывная величина on-  
going process — продолжающийся, постоянный, непрерывный процесс  
to rely [ri'laɪ] — основываться на ч.-л.; полагаться  
to install [in'stɔ:l] — устанавливать; размещать; монтировать; настраивать  
household appliances ['haʊshəʊld əp'laɪənsɪz] — домашние приборы / устройства  
microwave oven ['maɪkrouweɪv 'ʌvən] — микроволновая печь  
indoor climate control system — система регуляции температуры в доме

## Вопросы и задания:

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

Who designs computers and their accessory equipment? 2. What is the role of an analyst? 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. Where do they find application?

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



Функции ввода, хранения, обработки, управления и вывода информации; познакомиться; системные блоки; для начала; вспомогательные устройства; разработчик компьютерной системы; хорошая компьютерная подготовка; различные сферы применения; корпорация 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.

**Образуйте (и переведите) имена существительные от приведённых 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.

**Переведите предложения, содержащие Participle I и Participle II, в функции обстоятельства.**

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.

**Прочтите текст и объясните, как вы понимаете термины «аппаратное обеспечение» и «программное обеспечение». Переведите текст.**

**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 read-only memory (ROM), which can be read from but not written on.

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

### **Vocabulary**

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

software ['sɔftwɛə] — программное обеспечение; программные средства

system software — системное программное обеспечение

application software — прикладное программное обеспечение

firmware ['fɜ:mwɛə] — встроенное /микропроцессорное программное

обеспечение visible units ['vɪzɪbl 'ju:nɪts] — видимый блок, устройство

procedure [prə'si:dʒə] — процедура, процесс; метод, методика;

algorithm to associate [ə'souʃi'eɪt] — соединять; объединять; связывать

associated documentation — соответствующая документация

to execute applications programs — выполнять прикладные программы

payroll ['peɪroul] — платежная ведомость

inventory control [ɪn'ventərɪkən'troul] — инвентаризация; переучет

investment analyses [ə'nælɪsɪz] — анализ инвестиций

(капиталовложений) to protect [prə'tekt] — защищать

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

to refer to [rɪ'fɜ:] — относиться к; ссылаться на

to substitute ['sʌbstɪtju:t] — заменять; замещать

to cause ['kɔ:z] — заставлять, вынуждать; причина, основание

to accomplish [ə'kɒmplɪʃ] — завершать, заканчивать; выполнять, осуществлять

performance [prə'fɔ:məns] — производительность; быстрое действие; рабочая характеристика

### **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?

### **Найдите в тексте английские эквиваленты следующих словосочетаний:**

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

### **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.

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

### **Steps in The Developing of Computers**

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.

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.

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 is now accessible to people with no technical background.

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

**Раскройте скобки, употребляя:**

*Л. Правильную неличную форму глагола*

Computing is a concept (embraced; embracing; for embracing) not only arithmetic's, 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*

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 № 26.** **Functional Units of Digital Computers/** **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 УК-4.

### **Теоретическая часть:** **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:

Input— to insert outside information into the machine;

Storage or memory — to store information and make it available at the appropriate time;

Arithmetic-logical unit — to perform the calculations;

Output — to remove data from the machine to the outside world and

Control unit — to cause all 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 translates 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 ['bro:d 'vju:] — широкий взгляд, обзор

unit['jun:it] — 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-logical unit—  
 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'təprɪt] — интерпретировать; истолковывать  
 to issue commands ['ɪʃju: kə'ma:ndz] — выдавать команды  
 pulse — no-pulse — (есть) импульс — холостой импульс

### **Вопросы и задания:**

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

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?

**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.

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

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.

**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.

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

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

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

C. Good; bad; little; many.

**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 scientific problems 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

logic gates — логический элемент; схема пропускания (сигналов); проход

feasible — возможный; выполнимый; осуществимый

interpret orders — интерпретировать, истолковывать команды

operate switches — приводить в действие переключатели

convey [kən'vei] — передавать; сообщать

in response to — ответная

correct operand — нужный операнд original input data

— исходная вводимая информация

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

room — (свободное) место; свободная память

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

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?

**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.

**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 № 27. Storage Units / 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 УК-4.

### **Теоретическая часть: Storage Units**

Computer system architecture is organized around the primary storage unit because all data and instructions used by the computer 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 processing; 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 1, 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<sup>8</sup>, or 256 unique combinations of 1's and 0'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 / secondary storage — первичное / вторичное запоминающее устройство  
main storage — основная память; оперативное запоминающее устройство  
internal storage [in'tə:nəl] — внутреннее ЗУ  
sequence ['sɪkwəns] — последовательность; порядок следования  
intermediate results ['ɪntə'mɪdɪət nəzltz] — промежуточные результаты  
ongoing process ['ɒŋɡəʊɪŋ 'prəʊsəs] — продолжающийся, постоянный процесс  
similarity [sɪmɪ'lærɪti] — сходство; подобие  
to retain [rɪ'teɪn] — сохранять; удерживать  
to locate [ləʊ'keɪt] — размещать(ся); располагать(ся)  
value ['vælju:] — значение, величина; значимость, ценность; оценка  
binary digit ['baɪnəri 'dɪdʒɪt] — двоичная цифра; двоичный знак  
adjacent [ə'dʒeɪsənt] — смежный; соседний; примыкающий  
string of characters — последовательность символов  
consecutive [kən'sekjʊtɪv] — последовательный; смежный; соседний

### Вопросы и задания:

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

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

**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; размещать содержимое по требованию; система счисления; двоичная система счисления; возможные величины; объем информации; двоичный код; смежные ячейки памяти; последовательность символов; быстродействующее устройство; полупроводник; доступный.

**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; no significant 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.

**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 Participle Active 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.

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, Millicent's (0.001 cents) and micro cents (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

dataaccessstime — время доступа к данным

permit — 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 magneticdiscstorage — 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  
to meet the demands — удовлетворять потребности

**Ответьте на вопросы, используя информацию текста.**

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. What is a floppy?

**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 фиксированной головкой; удовлетворять потребности; гибкий диск.

**Переведите предложения, содержащие всевозможные формы причастий: Participle I, Participle II, Perfect Participle Active и Perfect Participle Passive.**

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.

## **Практическое занятие № 28.**

### **Central Processing Unit / Центральный процессор**

**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 УК-4.

### **Теоретическая часть:**

#### **Central Processing Unit**

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. Manufacturers 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 issuing 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.

In digital 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 ['ɪntə'tʃeɪndʒəbli] – взаимозаменяемым

образом precisely [pri'saɪsli] — точно

internal memory - внутренняя память; внутреннее ЗУ activity

[æk'tɪvɪti] - деятельность; работа; действия операции

to issue ['ɪʃu:] - посылать (сигнал); выводить, выдавать

(сообщение) response [ri'spɒns] - ответ; отклик; реакция; отвечать;

реагировать to interpret [ɪn'tɜːprɪt] - интерпретировать;

истолковывать; according to [əˈkɒdɪntə] - согласно; в соответствии с

level - уровень; степень; мера; выравнивать

input-output port - порт ввода-вывода

control unit (CU) [kən'trəʊl 'juːnɪt] - устройство управления arithmetic-

logical unit (ALU) - арифметико-логическое устройство switch ['swɪtʃ] -

переключатель; коммутатор; переключать; переходить

direct [dɪ'rekt] - направлять; адресовать; указывать; прямой;

непосредственный step-by-step operations – пошаговые операции

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

on the other hand - с другой стороны

exponentiation [eksprə'neɪʃən] - возведение в

степень Вопросы и задания:

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

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?

Where are data to be processed loaded into?

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

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.

**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; transmission 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.

**Переведите предложения, содержащие независимый причастный оборот.**

*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.

**Прочтите текст и скажите, о каких компонентах центрального процессора и их назначении вы узнали. Переведите текст.**

### **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 (ALU)* 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 bitable devices, which are called registers. Their purpose is to hold the numbers involved in the calculation and hold the results temporarily until they can be transferred to memory. At the core of the ALU is a very high speed 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 ['fləʊ] — поток; ход (выполнения программы); последовательность

counter ['kauntə] — счетчик

register ['redʒɪstə] — регистр; устройство регистрации; счетчик;

датчик instruction register — регистр команд

storage register — регистр памяти; запоминающий

регистр address register — адресный регистр

temporarily ['tempərəri] — временно

decoder [di'kəʊdə] — дешифратор

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

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

timing mark — отметка времени

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

accumulator — сумматор; накапливающий регистр; устройство суммирования

compare [kəm'preə] — сравнивать; соотноситься

comparer [kəm'preəgə] — компаратор; устройство сравнения

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

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

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

add ['æd] — складывать; суммировать; прибавлять;

присоединять added — добавочный; дополнительный

adder — сумматор; блок суммирования

at least — по крайней мере

### **Ответьте на вопросы, используя информацию текста.**

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?

### **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.

**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.

**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.

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

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 transferring 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.

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

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.

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 unknown properties, experiments with them are impossible.

When moving in a material charged particles (заряженные частицы) 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 5:COMPUTERSOFTWARE / ПРОГРАММНОЕ ОБЕСПЕЧЕНИЕ

### Практическое занятие № 29.

### The Operating System (OS) / Операционнаясистема

**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 УК-4.

#### Теоретическаячасть:

### GUI operating systems

The term **user interface** refers to the standard procedures that the user follows in order to interact with a computer. In the late 1970s and early 80s, the way users accessed computer systems was very complex. They had to memorize and type a lot of commands just to see the contents of a disk, to copy files or to respond to a single prompt. In fact, it was only experts who used computers, so there was no need for a user-friendly interface.

In 1984, Apple produced the Macintosh, the first computer with a mouse and a **graphical user interface (GUI)**. Macs were designed with one clear aim: to facilitate interaction with the computer. A few years later, Microsoft launched Windows, another operating system based on graphics and intuitive tools. Nowadays, computers are used by all kinds of people, and as a result there is a growing emphasis on accessibility and user-friendly systems.

A **GUI** makes use of a **WIMP** environment: **windows**, **icons**, **menus** and **pointer**. The background of the screen is called the **desktop**, which contains labelled pictures called **icons**. These icons represent **files** or **folders**. Double-clicking a folder opens a window which contains **programs**, **documents**, or more nested folders. When you are in a folder, you can launch a program or document by double-clicking the icon, or you can drag it to another location. When you run a program, your PC opens a window that lets you work with different tools. All the programs have a high level of consistency, with similar toolbars, menu bars, buttons and dialog boxes. A modern OS also

provides access to networks and allows multitasking, which means you can run several programs – and do various tasks – at the same time.

The most popular operating systems are:

- The **Windows** family – designed by Microsoft and used on most PCs. The most recent version is Windows Vista.
- **Mac OS** – created by Apple and used on Macintosh computers.
- **Unix** – a multi-user system, found on mainframes and workstations in corporate installations.
- **Linux** – open-source software developed under the GNU General Public License. This means anybody can copy its source code, change it and distribute it. It is used in computers, appliances and small devices.
- **Windows Mobile** – used on most PDAs and smartphones (PDAs incorporating mobile phones).
- **Palm OS** – used on Palm handheld devices.
- **RIM** – used on BlackBerry communication devices. Developed by Research In Motion.
- The **Symbian OS** – used by some phone makers, including Nokia and Siemens.

These computer platforms differ in areas such as device installation, network connectivity or compatibility with application software.

#### Вопросыи задания:

**Прочитайте, переведите текст «GUIoperatingsystems».**

**Переведите эти слова и выражения на русский язык. Используйте Интернет, чтобы помочь вам.**

- 1 user interface (line 1) \_\_\_\_\_
- 2 procedures (line 2) \_\_\_\_\_
- 3 commands (line 6) \_\_\_\_\_
- 4 tools (line 16) \_\_\_\_\_
- 5 desktop (line 21) \_\_\_\_\_
- 6 nested folders (line 25) \_\_\_\_\_
- 7 launch a program (line 26) \_\_\_\_\_
- 8 source code (line 45) \_\_\_\_\_

**Написание резюме. Суммируйте текст «Операционные системы GUI» в 90-100 словах, выполнив следующие действия:**

- 1 Read the text again.
- 2 Underline the relevant information in each paragraph.
- 3 Make notes about the main points. Leave out details such as examples.
- 4 Make sentences from the notes and link the sentences with connectors (*and, but, because, therefore, etc.*).
- 5 Write your first draft.
- 6 Improve your first draft by reducing sentences. For example:
  - Cut out unnecessary phrases  
*Macs were designed ~~with one clear aim~~ to facilitate interaction with the computer.*
  - Omit qualifying words (adjectives or modifying adverbs)  
*very complex*
  - Transform relative clauses into -ing participle clauses  
*Double-clicking a folder opens a window which contains programs, documents or ...*  
*Double-clicking a folder opens a window **containing** programs, documents or ...*
- 7 Write the final version of your summary. Don't forget to check the spelling and grammar.

**Работа в небольших группах. Составьте список всего компьютерного программного обеспечения, которое вы используете в своей работе или учебе. Подумай о:**

*application software*  
*programming software*  
*system software*

**5. Поговорите о программном обеспечении, которое вы и ваши коллеги не используете. Ответьте на вопросы.**

- What are the differences between the IT and non-IT software you have listed?  
 Which is the cheapest?  
 Which is the most expensive?  
 Which is the most/least reliable?  
 Which is the most difficult/easiest to use?  
 Which is the best/worst?  
 Which is the most/least user-friendly?

**Практическое занятие № 30.**  
**WordProcessing (WP) / Обработка текстов**

**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 УК-4.

### **Теоретическая часть:**

#### **Types of Word Processing Applications**

A word processor is an application that allows you to type in, edit, format, save, and print text. The text shows on screen the same or very similar to how it will appear in hard copy format. Word processors are commonly used by students, writers, authors, desktop publishing professionals and layout artists. Before you purchase a word processor, try several out. Some can be downloaded for free, and other can be downloaded for a trial period.

##### **Microsoft Word**

One of the most well-known and widely used word processing applications on the market is Microsoft Word. Word has more than 90 percent of the word processing market and more than 450 million users. Microsoft Corp. first released this program to the market in 1989, and since then there have been a number of upgrades to the software. Word can be purchased as part of the Microsoft Office suite of programs, which include Excel, PowerPoint, Outlook and Publisher. Word can be used to format text and build layout documents.

##### **WordPerfect**

WordPerfect is a word processing application from Corel Corp. WordPerfect was popular in the early 1990s. It is best for writing simple essays and articles. Though it isn't used as much today, WordPerfect is compatible with Microsoft Word, meaning that you can open and edit WordPerfect files in the Word program, then save them as WordPerfect files again. WordPerfect also can be used for formatting and laying out documents.

##### **Lotus Word Pro**

If you use Lotus Notes or Lotus 1-2-3- common in corporate environments- Lotus Word Pro is an ideal program for your word processing needs. This program works in concert with Lotus applications to allow you to create and distribute formatted text documents. It is produced and distributed by IBM Corp. Lotus Word Pro is also compatible with Microsoft Word and ideal for writing reports, memos and proposals.

##### **iWork Pages**

Pages is a word processing program offered by Apple Incorporated, so if you own a Mac computer this might be the ideal option for your needs. It is a part of Apple's iWork suite of programs. Pages allows you to perform basic word processing functions--writing and formatting--as well as more complex graphical layout actions. You can open and save Pages files in Microsoft Word.

##### **And the Rest**

There are dozens of word processors on the market. Other lesser-known word processors include OpenOffice Writer, Adobe In Copy, AbiWord, Microsoft Works and Scrivener. A growing number of online word processors are available and include Google Docs and Microsoft Office Web Apps.

### Вопросыизадания:

Прочитайте, переведите текст «Типы приложений для обработки текста». Ответьте на вопросы:

What is a word processor?

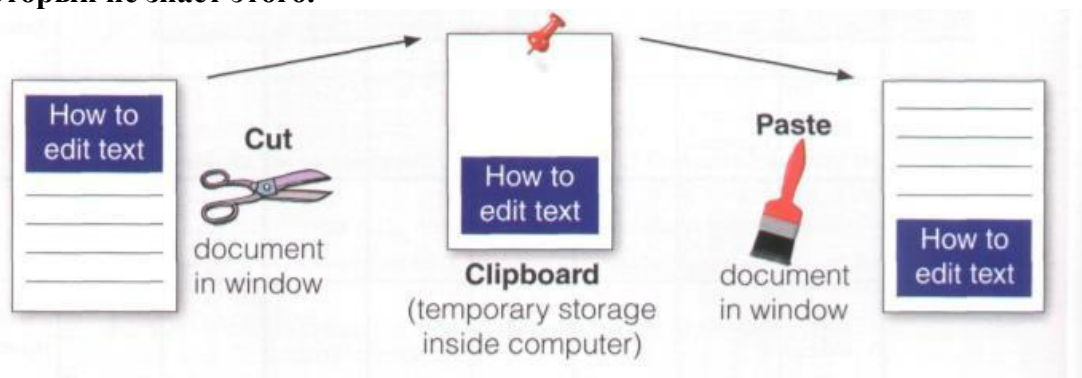
What kind of tasks do people use word processors for?

How many word processing programs do you know? Which do you think is the most popular and why?

Посмотрите на скриншот из MicrosoftWord и переведите обозначенные функции и функции на русский язык.



Перемещение текста - это процесс вырезания и вставки, как будто вы используете ножницы и клей. Сколько шагов требуется для выполнения задачи «Вырезать и вставить»? (Посмотрите на картинку ниже). Объясните, как выполнить это задание коллеге, который не знает этого.



Работа в парах. Ученик А: Дайте партнеру инструкции по созданию документа и сохранению его на диске. Ученик Б: Дайте партнеру инструкции о том, как вставить изображение из Интернета в документ Word.



## Databases / Базы 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 УК-4.

### Теоретическая часть:

#### Databases

A **database** is a collection of related data, and the software used in databases to store, organize and retrieve the data is called the **database management system**, or **DBMS**. However, we often use the word *database* to cover both meanings. A database can manage any type of data, including text, numbers, images, sound, video and hyperlinks (links to websites).

Information is entered into the database via **fields**. Each field holds a separate piece of information, and the fields are grouped together in **records**. Therefore, a record about an employee might consist of several fields which give their name, address, phone number, date of birth, salary and length of employment with the company.

Records are grouped together into **files** which hold large amounts of information. Files can easily be **updated** – you can always change fields, add new records or delete old ones. An electronic database is much faster to consult and update than a card index system and occupies a lot less space. With the right software, you can keep track of stock, sales, market trends, orders and other information that can help your company stay successful.

A database program lets you create an **index** – a list of records ordered according to the content of certain fields. This helps you to **search** the database and **sort**

records into numerical or alphabetical order very quickly. Modern databases are **relational** – that is, they are made up of related files: customers and orders, vendors and purchases, students and tutors, etc. Two database files can be related as long as they have a common field. A file of students, for example, could include a field called *Tutor ID* and another file with details of the tutors could include the same field. This key field can be used to relate the two files. Databases like Oracle, DB2 and MySQL can manage these relationships.

A database **query** function allows you to extract information according to certain conditions or criteria. For example, if a managing director wanted to know all the customers that spend more than €8,000 per month, the program would search on the name field and the money field simultaneously.

The best database packages also include **network** facilities, which can make businesses more productive. For example, managers of different departments can have direct access to a common database. Most aspects of the program can be protected by user-defined passwords and other **security devices**. For example, if you wanted to share an employee's personal details but not their commission, you could protect the commission field.

### Вопросы и задания:

**Прочитайте, переведите текст «Базы данных». Ответьте на вопросы:**

What database products do you know and use at work and at home?

How is the information entered into the database?

3. What does a database query function allow you to do?

4. Why do people and organizations use databases?

5. What kind of data do companies create, manipulate, store and retrieve?

**Сопоставьте отдел компании 1-8 с типом данных, с которыми он работает.**

Finance a) data about employees, training, and recruitment needs

Marketing b) data about product specification, details and design

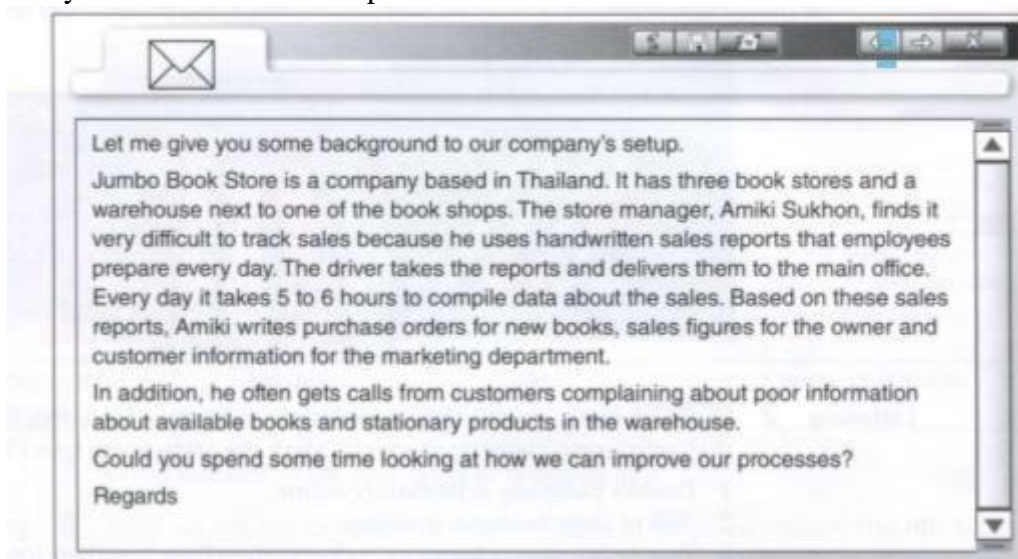
Human resources c) data about profits, tax, loans, shares and cash

Customer relations d) data about volume of products sold

- 5 Production e) data about customers, satisfaction surveys, promotions
- 6 Technical support f) data about product advertisements and competitors
- 7 Sales g) data about quantity of product in storage
- 8 Stock management h) information about the Help Desk, support calls, manuals, problem reports

**3. Прочитайте часть этого письма от владельца книжного магазина Jumbo. Ответьте на эти вопросы.**

What types of information does Jumbo Book Store communicate between its employees?  
 How do the employees exchange information in the company?  
 What documents does Amiki prepare?  
 How much time does it take to compile the data?  
 Why do the customers complain?



**Работа в небольших группах. Подготовьте письмо с рекомендациями, используя схему проблемы / решения:**

*Problems*

*Solutions*

*End results*

**Работать в парах. Практикуйтесь, спрашивая совета о решениях резервного копирования для небольшой компании.**

*Example: A: What would you recommend ...? B: I'd recommend .... /You should ....*

### **Практическое занятие № 32.**

#### **Data Storage and Back-up / Хранение данных и резервное копирование**

**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 УК-4.

### Теоретическая часть:

#### Data storage

Online storage is an (1) emerging method of data storage and back-up. A remote server with a network connection and special software backs up files, folders, or the entire (2) \_\_\_\_\_ of a hard drive. There are many companies that provide a web-based backup.

One (3) \_\_\_\_\_ technology in this area is (4) \_\_\_\_\_ computing. This allows colleagues in an organisation to share resources, software and information over the Internet.

Continuous backup and storage on a remote hard drive eliminates the risk of data (5) \_\_\_\_\_ as a result of fire, flood or (6) \_\_\_\_\_. Remote data storage and back-up providers (7) \_\_\_\_\_ the data and set up password protection to ensure maximum (8) \_\_\_\_\_.

Small businesses and individuals choose to save data in a more traditional way. External drives, disks and (9) \_\_\_\_\_ tapes are very popular data storage solutions. USB or (10) \_\_\_\_\_ memories, DVDs and hard disks are cheap and widely accessible solutions. These methods are very practical with small (11) \_\_\_\_\_ of data storage and backup. However, they are not very reliable and do not (12) \_\_\_\_\_ the user in case of a disaster.

### Вопросыизадания:

**Прочитайте и переведите статью «Хранение данных». Дополните предложения словами:**

cloud, contents, emerging, encrypt, flash, loss, magnetic, offsite, protect, security, theft, volumes.

**Подберите подходящие решения для хранения и резервного копирования данных на рисунках А-Е. Какие еще есть решения?**

*External hard drive, hard disk, mp3 player, server, the Internet,usb flash drive*



**3.Дополните эти предложения словами:** *about, at, between, for, from, in, into, of, to*

*Example: This database is used to store our financial information.*

What's the difference\_\_ a database and a spreadsheet?

A database is \_\_ storing data.

The school has information \_\_\_\_ students.

Can people access the system \_\_\_\_ the same time?

A database is a collection \_\_\_\_ records.

You retrieve information \_\_\_\_ the database.

You enter the data \_\_\_\_ the system.

Which software do you use \_\_\_\_ your work?

#### 4. Работать в парах. Объясните шаги обработки данных своими словами.

### Практическое занятие № 33. Graphics and Design / Компьютерная графика и дизайн

**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 УК-4.

#### Теоретическая часть:

##### Computer graphics

Computer graphics means drawing pictures on a computer screen. What's so good about that? Sketch something on paper—a man or a house—and what you have is a piece of **analog** information: the thing you draw is a likeness or *analogy* of something in the real world. Depending on the materials you use, changing what you draw can be easy or hard: you can erase pencil or charcoal marks easily enough, and you can scrape off oil paints and redo them with no trouble; but altering watercolors or permanent markers is an awful lot more tricky. That's the wonder of art, of course—it captures the fresh dash of creativity—and that's exactly what we love about it. But where everyday graphics is concerned, the immediacy of art is also a huge drawback. As every sketching child knows too well, if you draw the first part of your picture too big, you'll struggle to squeeze everything else on the page.... and what if you change your mind about where to put something or you want to swap red for orange or green for blue? Ever had one of those days where you rip up sheet after sheet of spoiled paper and toss it in the trash? That's why many artists, designers, and architects have fallen in love with computer graphics. Draw a picture on a computer screen and what you have is a piece of **digital** information. It probably looks similar to what you'd have drawn on paper—the ghostly idea that was hovering in your mind's eye to begin with—but inside the computer your picture is stored as a series of numbers. Change the numbers and you can change the picture, in the blink of an eye or even quicker. It's easy to shift your picture around the screen, scale it up or down, rotate it, swap the colors, and transform it in all kinds of other ways. Once it's finished, you can save it, incorporate it into a text document, print it out, upload it to a web page, or email it to a client or work colleague—all because it's *digital information*. (Find out more about the benefits of digital in our main article about analog and digital.)

##### Raster and vector graphics

All computer art is digital, but there are two very different ways of drawing digital images on a computer screen, known as raster and vector graphics. Simple computer graphic programs like Microsoft Paint and Paint Shop Pro are based on raster graphics, while more sophisticated

programs such as CorelDraw, AutoCAD, and Adobe Illustrator use vector graphics. So what exactly is the difference?

### **Raster graphics**

Stare hard at your computer screen and you'll notice the pictures and words are made up of tiny colored dots or squares called **pixels**. Most of the simple computer graphic images we come across are *pixelated* in this way, just like walls are built out of bricks. The first computer screens, developed in the mid-20th century, worked much like televisions, which used to build up their moving pictures by "scanning" beams of electrons (tiny charged particles inside atoms, also called cathode rays) back and forth from top to bottom and left to right—like a kind of instant electronic paintbrush. This way of making a picture is called **raster scanning** and that's why building up a picture on a computer screen out of pixels is called raster graphics.

### **Vector graphics**

There's an alternative method of computer graphics that gets around the problems of raster graphics. Instead of building up a picture out of pixels, you draw it a bit like a child would by using simple straight and curved lines called **vectors** or basic shapes (circles, curves, triangles, and so on) known as **primitives**. With raster graphics, you make a drawing of a house by building it from hundreds, thousands, or millions of individual pixels; importantly, each pixel has no connection to any other pixel except in your brain. With vector graphics, you might draw a rectangle for the basic house, smaller rectangles for the windows and door, a cylinder for the smokestack, and a polygon for the roof. Staring at the screen, a vector-graphic house still seems to be drawn out of pixels, but now the pixels are precisely related to one another—they're points along the various lines or other shapes you've drawn. Drawing with straight lines and curves instead of individual dots means you can produce an image more quickly and store it with less information: you could describe a vector-drawn house as "two red triangles and a red rectangle (the roof) sitting on a brown rectangle (the main building)," but you couldn't summarize a pixelated image so simply. It's also much easier to scale a vector-graphic image up and down by applying mathematical formulas called algorithms that transform the vectors from which your image is drawn. That's how computer programs can scale fonts to different sizes without making them look all pixelated and grainy.

### **3D graphics**

Real life isn't like a computer game or a virtual reality simulation. The very best **CGI (computer-generated imagery)** animations are easy to tell apart from ones made on film or video with real actors. Why is that? When we look at objects in the world around us, they don't appear to be drawn from either pixels or vectors. In the blink of an eye, our brains gather much more information from the real-world than artists can include in even the most realistic computer-graphic images. To make a computerized image look anything like as realistic as a photograph (let alone a real-world scene), we need to include far more than simply millions of colored-in pixels.

Really sophisticated computer graphics programs use a whole series of techniques to make hand-drawn (and often completely imaginary) two-dimensional images look at least as realistic as photographs. The simplest way of achieving this is to rely on the same tricks that artists have always used—such things as **perspective** (how objects recede into the distance toward a "vanishing point" on the horizon) and **hidden-surface elimination** (where nearby things partly obscure ones that are further away).

If you want realistic 3D artwork for such things as CAD (computer-aided design) and virtual reality, you need much more sophisticated graphic techniques. Rather than drawing an object, you make a 3D computer model of it inside the computer and manipulate it on the screen in various ways. First, you build up a basic three-dimensional outline of the object called a **wire-frame** (because it's drawn from vectors that look like they could be little metal wires). Then the model is **rigged**, a process in which different bits of the object are linked together a bit like the bones in a skeleton so they move together in a realistic way. Finally, the object is **rendered**, which involves shading the outside parts with different textures (surface patterns), colors, degrees of opacity or transparency, and so on. Rendering is a hugely complex process that can

take a powerful computer hour, days, or even weeks to complete. Sophisticated math is used to model how light falls on the surface, typically using either **ray tracing** (a relatively simple method of plotting how light bounces off the surface of shiny objects in straight lines) or **radiosity** (a more sophisticated method for modeling how everyday objects reflect and scatter light in duller, more complex ways).

### Вопросыизадания:

Прочитайте, переведите текст «Компьютерная графика». Ответьте на вопросы:

What are the differences between raster graphics and vector graphics?

Which computer graphics programs are mentioned in the text?

What does CAD stand for?

Сопоставьте слова (1-6) с определениями (a-f):

1 resolution	a special effects that can be applied to pictures
2 jagged	b a technique that generates realistic reflections, shadows and highlights
3 filters	c geometrical figures with special properties
4 wireframe	d irregular or uneven
5 rendering	e the number of pixels in an image
6 fractals	f the drawing of a model by using features like edges or contour lines

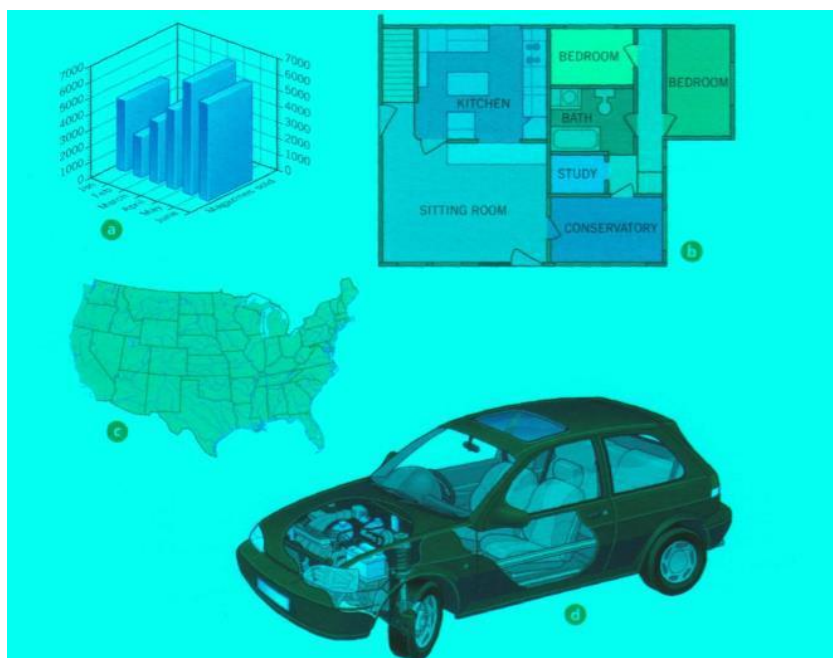
### 3.Посмотрите на компьютерную графику (a-d) и обсудите эти вопросы:

Which is these computer graphics are three-dimensional (3-D)?

What are the advantages of creating 3-D images?

Which types of professional might use the computer graphics (a-d)?

Who else uses computer graphics in their jobs? How do they use them?



**Выбор графического программного обеспечения. Работа в парах. Студент А выбирает задание из списка (1-6) и описывает его. Учащийся В выбирает наиболее подходящее программное обеспечение и обосновывает свой выбор. Используйте полезный язык для помощи.**

- 1 to edit and retouch photos
- 2 to create illustrations and drawings for a magazine
- 3 to prepare slideshows for training sessions or conferences
- 4 to make mechanical designs and architectural plans
- 5 to create dynamic simulations and special effects for films, TV, advertisements and games
- 6 to analyse geographic data and make maps

*Useful language:*

If I need to ..., what computer software would you recommend?

For that kind of task, the best thing would be...

It allows you to ... and ...

I would not recommend it, because...

A good program of this type is...

### **Практическое занятие № 34. Multimedia / Мультимедиа**

**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 УК-4.

### **Теоретическая часть:**



## Multimedia magic!

a

Multimedia applications are used in all sorts of fields. For example, museums, banks and estate agents often have information kiosks that use multimedia; companies produce training programs on optical discs; businesspeople use Microsoft PowerPoint to create slideshows; and teachers use multimedia to make video projects or to teach subjects like art and music. They have all found that moving images and sound can involve viewers emotionally as well as inform them, helping make their message more memorable.

The power of multimedia software resides in **hypertext**, **hypermedia** and **interactivity** (meaning the user is involved in the programme). If you click on a hypertext link, you can jump to another screen with more information about a particular subject. Hypermedia is similar, but also uses graphics, audio and video as hypertext elements.

b

As long as your computer has a **sound card**, you can use it to capture sounds in digital format and play them back. Sound cards offer two important capabilities: a built-in stereo synthesizer and a system called **MIDI**, or **Musical Instrument Digital Interface**, which allows electronic musical instruments to communicate with computers. A **Digital Audio Workstation (DAW)** lets you mix and record several tracks of digital audio.



*MIDI allows your computer to communicate with electronic keyboards and other devices*

You can also listen to music on your PC, or transfer it to a portable **MP3** player. MP3 is short for **MPEG audio layer 3**, a standard format that compresses audio files. If you want to create your own MP3 files from CDs, you must have a **CD ripper**, a program that extracts music tracks and saves them on disk as MP3s.

Audio is becoming a key element of the Web. Many radio stations broadcast live over the Internet using **streaming audio technology**, which lets you listen to audio in a continuous stream while it is being transmitted. The broadcast of an event over the Web, for example a concert, is called a **webcast**. Be aware that you won't be able to play audio and video on the Web unless you have a **plug-in** like RealPlayer or QuickTime.

c

Video is another important part of multimedia. **Video computing** refers to recording, manipulating and storing video in **digital format**. If you wanted to make a movie on your computer, first you would need to capture images with a **digital video camera** and then transfer them to your computer. Next, you would need a **video editing** program like iMovie to cut your favourite segments, re-sequence the clips and add transitions and other effects. Finally, you could save your movie on a DVD or post it on websites like YouTube and Google Video.

d

Multimedia is used to produce dictionaries and encyclopedias. They often come on DVDs, but some are also available on the Web. A good example is the Grolier Online Encyclopedia, which contains thousands of articles, animations, sounds, dynamic maps and hyperlinks. Similarly, the Encyclopedia Britannica is now available online, and a concise version is available for iPods, PDAs and mobile phones. Educational courses on history, science and foreign languages are also available on DVD. Finally, if you like entertainment, you'll love the latest multimedia video games with surround sound, music soundtracks, and even film extracts.

### Вопросы и задания:

Прочитайте и переведите текст «Магия мультимедиа» и совместите заголовки (1-4) с пробелами в начале каждого абзаца (a-d):

- Sound, music, MIDI
- Products full of pictures, action and sound
- Creating and editing movies
- The potential of multimedia

Исправьте технические ошибки в этих предложениях:

- 1 Multimedia training software is distributed on magnetic disks.
- 2 You need to have MIDI on your computer to hear speech and music.
- 3 A stereo synthesizer allows your computer to communicate with electronic musical instruments.
- 4 A CD ripper converts CDs to live streams.
- 5 The Encyclopedia Britannica is only available on DVD.

**Обсудите в небольшой группе из 3-4 студентов, какие приложения мультимедиа вы бы использовали для:**

Creating virtual reality  
 Distance learning  
 A business presentation  
 A touch screen information kiosk  
 A MMS mobile phone

**4. Написание резюме. Суммируйте текст «Магия мультимедиа» в 90-100 слов.**

## РАЗДЕЛ 6. INPUT-OUTPUT DEVICES / УСТРОЙСТВА ВВОДА-ВЫВОДА ИНФОРМАЦИИ

### Практическое занятие № 35. Input and Output Devices / Устройства ввода и вывода 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 УК-4.

#### Теоретическая часть:

##### Input and output devices

An input device sends information to a computer system for processing, and an output device reproduces or displays the results of that processing. Input devices *only* allow for input of data to a computer and output devices *only* receive the output of data from another device. Most devices are only input devices or output devices, as they can only accept data input from a user or output data generated by a computer. However, some devices can accept input and display output, and they are referred to as I/O devices (input/output devices). For example, as you can see in the top half of the image to the right, a keyboard sends electrical signals, which are received by the computer as **input**. Those signals are then interpreted by the computer and displayed, or **output**, on the monitor as text or images. In the lower half of the image, the computer sends, or **outputs**, data to a printer, which will print the data onto a piece of paper, also considered **output**.



## Input devices

An **input** device can send data to another device, but it cannot receive data from another device. Examples of input devices include the following.

**Keyboard and Mouse** - Accepts input from a user and sends that data (input) to the computer. They cannot accept or reproduce information (output) from the computer.

**Microphone** - Receives sound generated by an input source, and sends that sound to a computer.

**Webcam** - Receives images generated by whatever it is pointed at (input) and sends those images to a computer.

**Scanner**

**Game controller**

## Output devices

An **output** device can receive data from another device and generate output with that data, but it cannot send data to another device. Examples of output devices include the following.

**Monitor** - Receives data from a computer (output) and displays that information as text and images for users to view. It cannot accept data from a user and send that data to another device.

**Projector** - Receives data from a computer (output) and displays, or projects, that information as text and images onto a surface, like a wall or a screen. It cannot accept data from a user and send that data to another device.

**Speakers** - Receives sound data from a computer and plays the sounds for users to hear. It cannot accept sound generated by users and send that sound to another device.

## Вопросы и задания:

1. Прочитайте и переведите текст «Устройства ввода и вывода». Поставьте картинки 1-8 словами из текста.



1 \_\_\_\_\_



2 \_\_\_\_\_



3 \_\_\_\_\_



4 \_\_\_\_\_



5 \_\_\_\_\_



6 \_\_\_\_\_



7 \_\_\_\_\_



8 \_\_\_\_\_

Заполните предложения, описывающие устройства.

- 1 This device is \_\_\_\_\_ enter information into the computer.
- 2 ... it may also \_\_\_\_\_ function keys and editing keys \_\_\_\_\_ special purposes.
- 3 This is a device \_\_\_\_\_ the cursor and selecting items on the screen.
- 4 It usually \_\_\_\_\_ two buttons and a wheel.
- 5 ... the user \_\_\_\_\_ activate icons or select items and text.
- 6 It \_\_\_\_\_ detecting light from the computer screen and is used by pointing it directly at the screen display.
- 7 It \_\_\_\_\_ the user \_\_\_\_\_ answer multiple-choice questions and ...

**В парах выберите одно из устройств ввода и опишите его функции и возможности. Попробуйте угадать, какое устройство описывает ваш партнер.**

**Дополните текст о мышке этими глаголами:** *click, double-click, drag, grab, select, move, control.*

### Mouse actions

A mouse allows you to (1) \_\_\_\_\_ the cursor and move around the screen very quickly. Making the same movements with the arrow keys on the keyboard would take much longer. As you (2) \_\_\_\_\_ the mouse on your desk, the pointer on the screen moves in the same direction. The pointer usually looks like an I-bar, an arrow, or a pointing hand, depending on what you are doing.

A mouse has one or more buttons to communicate with the computer. For example, if you want to place the insertion point or choose a menu option, you just (3) \_\_\_\_\_ (press and release) on the mouse button, and the option is chosen.

The mouse is also used to (4) \_\_\_\_\_ text and

items on the screen. You can highlight text to be deleted, copied or edited in some way.

The mouse is widely used in graphics and design. When you want to move an image, you position the pointer on the object you want to move, press the mouse button, and (5) \_\_\_\_\_ the image to a new location on the screen. Similarly, the mouse is used to change the shape of a graphic object. For example, if you want to convert a square into a rectangle, you (6) \_\_\_\_\_ one corner of the square and stretch it into a rectangle.

The mouse is also used to start a program or open a document: you put the pointer on the file name and (7) \_\_\_\_\_ on the name – that is, you rapidly press and release the mouse button twice.

### Практическое занятие № 36. Input-Output Environment/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 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;

external environment — внешняя среда

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

human-independent — независимый от человека

remote terminal [ri'mout 'tə:minəl] — удаленный терминал

reel of magnetic tape — бобина с магнитной лентой

input-output interface — интерфейс (сопряжение, место стыковки) ввода-вывода scan ['skæn] — просматривать; сканировать; развертывать

scanner ['skænə] — сканер; устройство оптического считывания

bar-code scanner / bar-code reader — устройство считывания штрих-кода

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

to match characteristics ['mætʃkærəktə'ristiks] — сопоставлять параметры

similarly ['similəli] — подобным образом; также; аналогично

to fall between — падать; попадать в интервал между

card reader — устройство считывания платы (карты)

line printer — почтовый принтер; принтер печатания строки

page printer — принтер с страничной печатью

characterprinter — принтер с посимвольной печатью  
 opticalcharacterreader — оптическое считывающее устройство текста  
 opticalmarkreader — оптическое считывающее устройство знаков  
 visualdisplay ['vɪʒuəl'dɪs'pleɪ] — визуальный индикатор  
 digitizer [dɪdʒi'taɪzə] — аналого-цифровой преобразователь; сканер  
 keyboardinput device — клавишное устройство ввода  
 plotter ['plɒtə] — графопостроитель  
 voicerecognitionand responseunit — устройство распознавания голоса и реагирования

### **Вопросы и задания:**

**Дайте ответы на следующие вопросы:**

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 is an I/O interface? 6. What are the major differences between the various I/O devices? 7. What types of I/O devices tend to be high-speed devices? 8. What types of devices tend to be low-speed devices?

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

Среда устройств ввода-вывода; система обработки информации; внешняя среда; связан человек; 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 environment; management environment; multimedia environment; network environment; processing environment; security environment; software environment; user environment.

*Interface:* channel 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.

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

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 20<sup>th</sup> century. 4. Mendeleev'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* originally 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 be arranged* in a single or very small number of integrated circuits is called a microprocessor. 10. Russia was the first country *to start* the cosmic era.

**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... (dwells on...; 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 № 37.**

#### **Input Devices/Устройства ввода информации**

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

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**Актуальность темы:** обусловлена необходимостью овладения УК-4.

#### **Теоретическая часть:**

##### **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 images. 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 inputting 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 (photography's, pictures, slides) and texts and converting them into the computer form.

*Digital video cameras* have been spread recently. They enable getting video images 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 ['ki:bɔ:d] — клавиатура

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

manipulator [mə'nɪpjʊ'leɪtə] — манипулятор; блок обработки

trackball ['trækbɔ:l] — трекбол

touch panel ['tʌʃ'pænl] — сенсорная панель

graphic plotting tables ['græfɪk 'plɒtɪŋ 'teɪbls] — графические

планшеты sound card ['saund 'ka:] — звуковая карта (плата)

enable [i'neɪbl] — разрешать; позволять; допускать; делать возможным

operating mode [ɒpə'reɪtɪŋ 'mɔ:ð] — режим работы

press a button — нажать на кнопку

keep buttons depressed — удерживать кнопки в нажатом

состоянии double-click ['dʌbl 'kɪk] — двойное нажатие

erase images [i'reɪz 'ɪmɪdʒɪz] — удалить, стереть изображение (объект)

roller ['rɒlə] — ролик; валик

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

by means of — посредством

permitting capacity — разрешающая способность

### **Вопросы и задания:**

**Ответьте на вопросы, используя информацию текста.**

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?

**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.

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

*To accomplish*: accomplished; unaccomplished; accomplishment.

*To adapt*: adaptable; unadaptable; adaptability; inadaptability; 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

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

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 IC. 8. We 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).

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

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

When was the first Soviet computer put into operation?

a) in 1950; b) in 1951; c) in 1952

Who headed the serial production of computers in the USSR?

a) A.Krylov; b) S.Lebedev; c) U. Basilevsky

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

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

When did the production of the third generation computers begin?

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

### Практическое занятие № 38.

#### Output Devices. Printers/ Устройства вывода информации. Принтеры

**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 УК-4.

#### Теоретическая часть:

##### Output Devices. Printers

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. We will 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 drum 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 electrophotography techniques, have developed from the paper copier technology. Laser-beam printers use a combination of laser beam and electro photographic techniques to create printer output at a rate equal to 18000 lines per minute.

### Vocabulary

human-readable form — удобная для чтения форма

performance [prə'fɔ:məns] — (рабочая) характеристика; производительность; быстрое действие; скорость работы; пропускная способность

character printer — принтер с посимвольной печатью; символьный принтер

line printer ['laɪn] — принтер с построочной печатью

page printer ['peɪdʒ] — принтер с постраничной печатью

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

letter-quality printer — принтер с типографским качеством печати

dot-matrix printer ['dɒt 'meɪtrɪks] — точечно-матричный принтер

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

laser-beam printer ['leɪzə 'bi:m] — лазерный принтер

to identify [aɪ'dentɪfaɪ] — идентифицировать; распознать; обозначить

approach [ə'prəʊtʃ] — 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 — ударять по ленте

typewriter ['taɪpraɪtə] — печатное устройство

to spray drops of ink — распылять капли чернил

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

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

printer output — вывод на печать; распечатываемые данные

### Вопросы и задания:

#### Ответьте на вопросы, используя информацию текста.

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?

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

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; точно-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.

**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.

**Переведите предложения, содержащие инфинитивный оборот**

**Nominative with the Infinitive (сложное подлежащее).**

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. Electro photographic 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.

**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 multi station 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.

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

#### **Keyboard Devices**

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 typewriter like 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.

Different types of keyboard devices, such as visual display terminals, telepointer terminals, and point-of-sale devices are among the keyboard devices.

A light pen is a photosensitive pen like 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.

Telepointer 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 telepointer terminal. A telepointer terminal has a keyboard for input and a typewriter like 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 № 39.**

#### **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 УК-4.

### **Теоретическая часть:**

#### **Personal Computers**

Personal computers are supposed to appear in the late 1970s. One of the first and most popular personal computers was the Apple 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 — персональные компьютеры

competitive operating systems — конкурирующая операционная система

IBM (International Business Machine) — фирма по производству компьютеров

to enter the fray — ввязаться в драку

computer of choice — лучший компьютер

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

to survive onslaught [sə'vaiv 'ɒnslɒt] — 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 ['plʌg in] — подключать; подсоединять leisure activities ['leɪə ək'tɪvɪtɪz] — досуговая деятельность

### Вопросы и задания:

**Ответьте на вопросы, используя информацию текста.**

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?

### 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.

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

**Переведите сложные предложения:**

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

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 IC 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.

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.

**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 — обработка текста

telephone dialing ['teləfoun 'daɪəlɪŋ] — набор номера телефона

security [sə'kjʊərɪti] — безопасность; охрана

appliance [ə'plaɪəns] — устройство; прибор

maintenance ['meɪntənəns] — поддержание; сохранение; эксплуатация

application software — прикладные программы

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

to move paragraphs around — менять места абзацев

accountant [ə'kaʊntənt] — бухгалтер

accounting [ə'kaʊntɪŋ] — бухгалтерский учет

income tax ['ɪnkʌm 'tæks] — подоходный налог

stock market forecasting — биржевые прогнозы

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

scheduling ['ʃedʒʊlɪŋ] — составление расписания, графика

computer-assisted instructions — компьютерные команды

to meet the demands — удовлетворять потребности

record keeping — регистрация; ведение записей

grading ['greɪdɪŋ] — оценивание; классификация

**Ответьте на вопросы, используя информацию текста.**



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 typ-ing any material and how? 8. What other changes in the typed text can you make using a display?

Which professions are in great need of computers? 10. How can computers be used in education?

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

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 реальных жизненных ситуаций.

**Найдите в текстах слова:**

*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;

*противоположные по значению следующим словам:*

**Verbs:** to finish; to switch on; to take; to delete. **Nouns:** online; input; work.

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

**Расшифруйте следующие аббревиатуры и переведите их.**

PC; PU; CU; ALU; CPU; MPU; IBM; DOS; CRT; ROM; RAM; IC; SSI; MSI; LSI; VLSI;

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

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 manufacture 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.

**Вспомните формы причастий, проанализируйте и переведите следующие предложения:**

Participle	Active	Passive
Present	<i>using</i>	<i>being used</i>
Past	-	<i>used</i>
Perfect	<i>having used</i>	<i>Having been used</i>

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 analyzed. 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. 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.

**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.**

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 7. INFORMATION-DEPENDENT SOCIETY / ИНФОРМАЦИОННО ЗАВИСИМОЕ ОБЩЕСТВО**

### **Практическое занятие № 40. 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 УК-4.

### **Теоретическая часть: COMPUTER LITERACY**

Informed citizens of our information-dependent society should 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 privileged people had an opportunity to learn the basics, called the three R's: reading, writing, and arithmetic's. 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, arithmetic's, 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 'lɪtərəsi] — компьютерная грамотность

problem-solving device — устройство, обеспечивающее решение

задачи be aware of [biə'weəɹɒv] — понимать, сознавать

opportunity [ɒpə'tju:niti] — возможность

basics ['beisiks] — основы

application [æpli'keɪʃn] — применение; использование

to restate [ri'steɪt] — пересмотреть, переосмыслить

significant [sig'nɪfɪkənt] — значительный achievement

[ə'tʃɪ:vmənts] — достижения

computing [kəm'pjʊ:tɪŋ] — вычисление; счет; работа на компьютере

to embrace [ɪmb'reɪs] — охватывать

dimension [di'menʃn] — измерение

instruction [ɪn'strʌkʃn] — команда, инструкция,

указание to direct the operation — направлять работу

to process [prəʊ'ses] — обрабатывать

subscription magazine [səb'skrɪpʃhmægə'zi:n] — журнал по подписке

data processing system ['deɪtəprə'seɪŋ 'sɪstəm] — система обработки данных

store manager ['stɔ: 'mænədʒə] — директор магазина

to have much in common — иметь много общего

## Вопросы и задания:

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

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.

**Прочтите, переведите и запомните следующие выражения:**

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.

**Вспомните образование и случаи употребления The Past Simple Tense.**

**A. 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.**

Many people have an opportunity to use computers.

There is no doubt that computers solve problems very quickly.

Instructions direct the operation of a computer.

Computers bring with them both economic and social changes.

Computing embraces not only arithmetic's, but also computer literacy.

It is well known that computers prepare laboratory tests.

Those persons are computer literate and think of buying a new computer.

They receive a subscription magazine once a month.

My mother is ill and visits her doctor every other day.

Experts know much about how to prepare programs.

**Выберите правильный вариант из предложенных.**

What is that? [A — *They* / B — *It* / C — *There*] is my computer.

My brother is [A — *one* / B — *a* / C — *an*] officer.

[A — *This* / B — *These* / C — *That*] flowers are very beautiful.

Are [A — *those* / B — *that* / C — *there*] books interesting?

[A — *It has* / B — *It is* / C — *There is*] a dog in the garden.

I [A — *has* / B — *have* / C — *had*] to go to the library tomorrow.

Kate is here, but her parents [A — *isn't* / B — *wasn't* / C — *aren't*].

You ought [A — *stay* / B — *to stay* / C — *staying*] at home.

He should [A — *write* / B — *to write* / C — *writing*] a letter.

Mike [A — *like* / B — *likes* / C — *can*] to speak English.

I hope you've got [A — *a* / B — *any* / C — *some*] money.

Do you want [A — *know* / B — *to know* / C — *knowing*] the news?

We've got [A — *a few* / B — *a little* / C — *a number*] apples left.

There aren't [A — *a lot* / B — *many* / C — *much*] people here today.

[A — *Is* / B — *Has* / C — *Does*] she gets up early every day?

Were you in Moscow last year? — No, I [A — *didn't* / B — *weren't* / C — *wasn't*].

I [A — *have never been* / B — *was never* / C — *am never being*] to Moscow yet.

[A — *Isn't* / B — *Doesn't* / C — *Hasn't*] she going to clean the room today?

The boys [A — *play* / B — *is playing* / C — *are playing*] football at the moment.

She [A — *caught* / B — *catches* / C — *will catch*] the 7. 30 train yesterday.

Kate [A — *loses* / B — *has lost* / C — *lost*] her pencils very often.

[A — *Did you do* / B — *Do you do* / C — *Have you done*] much work yesterday?

He [A — *hurries* / B — *hurried* / C — *is hurrying*] because he was late.

Who is she looking [A — *on* / B — *at* / C — *to*].

Our holidays are [A — *in* / B — *at* / C — *on*] August.

What's the matter [A — *by* / B — *on* / C — *with*] him?

This book is [A — *my* / B — *me* / C — *mine*].

Don't help him. He will do everything [A — *myself* / B — *himself* / C — *yourself*].

We are playing [A — *ours* / B — *our* / C — *us*] favorite game.

It is much [A — *warm* / B — *warmer* / C — *more warm*] here.

She is not as old [A — *that* / B — *than* / C — *as*] I am.

Ann is [A — *very* / B — *more* / C — *much*] intelligent than Max.

Yesterday was the [A — *shortest* / B — *shortest* / C — *very short*] day this year.

We'll listen to Professor's lecture and [A — *therefore* / B — *then* / C — *than*] we'll have a break.

He is the [A — *very good* / B — *best* / C — *better*] student in the group.

[A — *Where* / B — *Why* / C — *Who*] wrote that letter?

She went home early [A — *because* / B — *while* / C — *till*] she had finished her work.

[A - Who/ B - Where/ C- When] did you put my book?  
[A - How/B - Why/C- Where] is Bill? - Very well, thanks.  
He drives [A — more careful / B — very carefully / C — very careful].

## 5. Прочтите и переведите текст:

### The Evolution of Artificial Intelligence

The evolution of artificial intelligence is 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 problem faster 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 coolly 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 telepointer with 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. Опираясь на содержание прочитанного текста, закончите предложения, используя предлагаемые варианты:** 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.

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

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

We most easily assess people's intelligence...

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

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

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

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

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

### Ответьте на вопросы:

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

What does the Turing Test consist of?

Why do we decide that computer's mental capacity is approaching the human level?  
Are you enthusiastic or skeptical about the planet "run by the computers"?  
Do you agree that the evolution of artificial intelligence is now proceeding very rapidly?  
Give reasons for your answer.

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

### **Практическое занятие № 41. Application of Computers / 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 УК-4.

#### **Теоретическая часть: 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 coun-

tries?" 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 [ələktˈkɔ:nikˈsə:kit] — электронная цепь, схема  
to operate switches [ɔpəˈreit ˈswitʃɪz] — приводить в действие переключатели  
to store numbers [ˈstɔ: ˈnʌmbəz] — запоминать числа  
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 [prəʊˈses ˈdeɪtə] — обрабатывать данные  
to supply [səˈplai] — подавать, вводить, снабжать, обеспечивать  
addition [əˈdɪʃn] — сложение  
subtraction [sʌbˈtrækʃn] — вычитание  
division [diˈvɪʒn] — деление  
multiplication [ˈmʌltipliˈkeɪʃn] — умножение  
exponentiation [eksprəˈnenʃiˈeɪʃn] — возведение в степень  
user [ˈju:zə] — пользователь  
input device [ˈɪnpʊt diˈvaɪs] — устройство ввода  
disk drive [ˈdisk ˈdraɪv] — дисковое запоминающее устройство, дисковод  
tape drive [ˈteɪp ˈdraɪv] — запоминающее устройство на магнитной ленте  
cathode-ray tube [ˈkæθədreɪ ˈtju:b] — электронно-лучевая трубка  
to make decisions — принимать решения  
instantaneously [ˈɪnstənˈteɪnjəsli] — мгновенно,  
немедленно  
to maintain records — вести учёт  
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:

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

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?

**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.

**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.

**Прочтите и переведите текст.**

### **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 classroom.

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 postindustrial, or information society.

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

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

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

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

**Вставьте необходимые слова вместо пропусков.**

Information is given into the computer in the form of \_\_\_\_.

ideas; b) characters; c) rules

The basic function of a computer is \_\_\_\_ information.

to switch; b) to keep; c) to process

The data needed for solving problems are kept in the \_\_\_\_.

memory; b) input device; c) output device

Inputting information into the computer is realized by means of \_\_\_\_.

a printer; b) letters; c) diskettes

A computer can carry out arithmetic-logical operations \_\_\_\_.

quickly; b) instantaneously; c) during some minutes

Computers have become \_\_\_\_ in homes, offices, research institutes.

commonwealth; b) commonplace; c) common room

Space \_\_\_\_ uses computers widely.

information; b) production; c) exploration

Computers are used for image \_\_\_\_.

processing; b) operating; c) producing

Computers help in \_\_\_\_ of economy.

invironment; b) management; c) government.

Air traffic control depends on computer-\_\_\_\_information.

generated; b) instructed; c) combined

**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;

Output device    e) information given in the form of characters.

**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, for instance, 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 programmers into the computer all the considerations that go into designing a highway across country, and then further programmers into the computer the basic features of the country across which the highway has to be built, the computer can, very rapidly, work out where the highway should go to take the fullest advantage of the physical and economic characteristics of the terrain. It can similarly work out many physical arrangements, particularly those in which a large mass of consideration has to be worked out into one optimal solution. Here the great capacity of the computer to handle large masses of variables fast comes into 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 cannot determine 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.

**Опираясь на содержание прочитанного текста, закончите предложения, используя предлагаемые варианты:** collecting, storing, analyzing and presenting information; things do not go as expected; of its calculating capacity; capacity to analyze; through what it needs; of physical structures; fast comes into play; stocks of a certain merchandise should be renewed.

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

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

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

And it can immediately alert management if ...

It means that management has to think ...

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

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

It can report when ...

**Соответствуют ли следующие утверждения содержанию текста:**

The computer is being used as a printer only.

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

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

**Ответьте на вопросы:**

What can the computer do if properly instructed?

When can the computer take over control?

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

What can the computer rapidly work out?

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

**Практическое занятие № 42.****Development of Electronics/ 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 УК-4.

**Теоретическая часть:****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 20<sup>th</sup> 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 War II 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 (IC), 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 discrete components on a chip one at a time, large groupings of these components together with their interconnections were made all at a time. IC greatly reduced the

size of devices, lowered manufacturing costs and at the same time they provided high speed and increased reliability.

### **Vocabulary**

applied physics — прикладная физика  
generation [dʒənə'reɪʃn] — создание, формирование, выработка  
scientific research [saɪən'tɪfɪkri'ɜ:tʃ] — научные исследования  
due to the efforts ['dju: təðə 'efəts] — благодаря усилиям  
manipulation [mænɪpjʊ'leɪʃn] — управление; обработка; преобразование  
to replace vacuum tubes — заменять электронные лампы  
piece of semiconductor ['semɪkən'dʌktə] — полупроводниковый кристалл  
reduced weight [ri'dju:st 'weɪt] — уменьшенный вес  
power consumption ['paʊəkən'sʌmpʃn] — потребление (расход) электроэнергии  
to carry out ['kæriəʊt] — выполнять; осуществлять  
solid body — твердое тело; кристалл; полупроводник  
to respond [ri'spɒnd] — отвечать; реагировать  
at a rate — со скоростью  
integrated circuit (IC) [ɪntə'greɪtɪd 'sə:kɪt] — интегральная схема  
batch processing ['bætʃprou'sesiŋ] — пакетная обработка  
to assemble [ə'sembl] — собирать; монтировать  
to lower manufacturing ['ləʊəmənju'fæktʃəriŋ] — снизить производительность  
to increase reliability ['ɪnkri:srɪləiə'bɪlɪti] — увеличить надёжность

### **Вопросы и задания:**

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

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?

### **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; discrete components; chip.

### **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.

**Переведите следующие «цепочки существительных». Запомните, что переводить ряд существительных, не связанных предлогами, следует, как правило, с конца. Запишите и выучите их.**

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. Прочтите и переведите текст:**

### **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 for extremely 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 IC, large-scale IC and very-large-scale IC. The change in scale was measured by the number of transistors on a chip. There appeared a new type of integrated circuits, microwave integrated circuit. The evolution of microwave IC began with the development of planar transmission lines. Then new IC components in a fine line 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 [prə'fɔ:məns] — рабочая характеристика; параметры; производительность; быстрое действие

to predict [prə'dikt] — прогнозировать

capability [keɪpə'bɪlɪti] — способность; возможность

branch of science ['brɑ:ntʃəv 'saɪəns] —

область науки to embrace [ɪm'breɪs] — охватывать

circuit assembly ['sɜ:kɪtə'sembli] — сборка схемы

film technique ['fɪlm tæk'nik] — пленочная технология (метод, способ)

invisible to unaided eye — невидимый невооруженному глазу

to react [rɪ'ækt] — реагировать

speed of response — скорость реакции (отклика)

advantage / disadvantage [əd'vɑ:ntɪdʒ] — достоинство, преимущество /

недостаток benefit ['benəfɪt] — выгода, польза; помогать, приносить пользу

to result from [ri'zʌltfrəm] — возникать, происходить в  
 результате packing density [ˈpækɪŋ ˈdensɪti] — плотность упаковки  
 small-scale integrated circuit — малая интегральная схема (МИС)  
 medium-scale IC — средняя интегральная схема (СИС) large-  
 scale IC — большая интегральная схема (БИС) very-large-scale IC  
 — сверхбольшая интегральная схема (СБИС)  
 fine line [ˈfaɪnlain] — прецизионный; с элементами уменьшенных  
 размеров transmission line — линия передачи  
 waveguide [ˈweɪvgaid] — волновод  
 to emerge [i'mə:dʒ] — появляться, возникать  
 to displace — перемещать, смещать  
 mode — вид, метод, способ; режим работы  
 pattern — шаблон, образец; образ, изображение  
 power [ˈpaʊə] — мощность, энергия, питание; производительность,  
 быстрое действие; способность, возможность

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

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 microelectronic techniques developing?

**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.

**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; unfavorable; unforgettable; unkind.

*non-*: non-effective; non-aggressive; non-comparable; non-computable; non-constant; noncontrollable; non-digital; non-dimensional; non-programmable; non-usable.

*ir-*: irregular; irrelative; irresponsible; irrational; irreplaceable; irrecognizable.

**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.*



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 device and built the first IC in 1958.

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

\* \* \*

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 ruggedness, the transistor is very reliable and has much better efficiency in professional equipment.

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 \_\_\_\_\_

Filament power loss — отсутствие энергии на нити накала

**Вставьте необходимые слова вместо пропусков.**

Transistors have many \_\_\_\_ over vacuum tubes.

patterns; b) advantages; c) scales

They \_\_\_\_ very little power.

consume; b) generate; c) embrace

An integrated circuit is a group of elements connected together by some circuit \_\_\_\_ technique.

processing; b) assembly; c) manipulation

The transistor consists of a small piece of a \_\_\_\_ with three electrodes.

diode; b) conductor; c) semiconductor.

Modern..... began in the early 20<sup>th</sup> century with the invention of electronic tubes.

miniaturization; b) electronics; c) microelectronics

John Fleming was the \_\_\_\_ of the first two-electrode vacuum tube.

generator; b) receiver; c) inventor

One of the transistor advantages was lower power....., in comparison with vacuum tubes.

consumption; b) reception; c) transmission.

Microelectronics greatly extended man's intellectual \_\_\_\_ subsystems; b) capabilities; c) dimensions

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

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 discrete 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 № 43.** **The First Calculating Devices/ 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 УК-4.

#### **Теоретическая часть:**

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 16<sup>th</sup> century, and it is still being used in some parts of the world because it can be understood without knowing how to read.

During the 17<sup>th</sup> and 18<sup>th</sup> 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 Isaac 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.

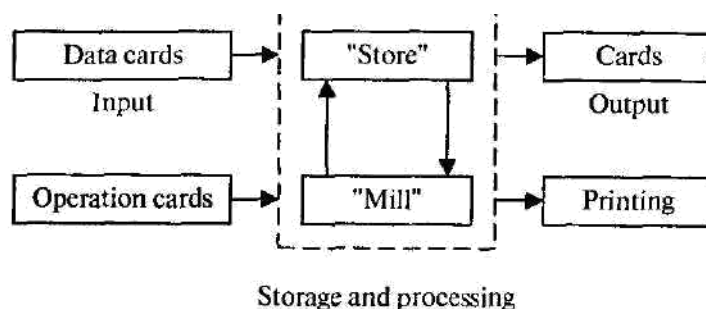


Fig. 2. Ch. Babbage's analytical engine

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 future.

## Vocabulary

calculating device [kælkjuːˈleɪtɪŋdiˈvaɪs] — вычислительное устройство  
 multiple ['mʌltɪpl] — кратный  
 abacus ['æbəkəs] — счеты  
 slide rule ['slaid 'nru:l] — логарифмическая линейка  
 logarithm table ['lɒɡərɪθm 'teɪbl] — логарифмическая таблица  
 calculus [kælkjʊːləs] — исчисление; математический анализ  
 general-purpose ['dʒenərə 'pə:pas] — общего назначения, универсальный  
 to cut out the human being altogether — полностью исключить человека  
 to manipulate [mə'nɪpjuleɪt] — обрабатывать, преобразовывать; управлять  
 data processing ['deɪtəpre'sesiŋ] — обработка данных (информации)  
 tabulate the census — занести данные по переписи (населения) в таблицу  
 means of coding ['mi:nzəv 'kəʊdɪŋ] — средства кодирования (шифровки)  
 to punch the holes ['pʌntʃ 'be 'həʊlz] — пробивать отверстия  
 punched card ['pʌŋt 'kɑ:d] — перфокарта  
 to perform [prə'fɔ:m] — выполнять, производить (действие); осуществлять;  
 unit of data ['ju:nɪtəv 'deɪtə] — единица информации  
 keyboard terminals — терминал (вывод) с клавишным управлением  
 proliferation [prə'lɪfə'reɪʃn] — размножение, быстрое увеличение

## Вопросы и задания:

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

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?

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?

**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

**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.

**Переведите словосочетания, содержащие:**

**А. Причастие I — Participle I**

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.

**Прочтите и переведите текст:**

**The First Computers**

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 Pennsylvania, 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'pjʊ:tə] — аналоговый компьютер  
digital computer ['dɪdʒɪtəl] — цифровой компьютер  
to aim guns ['eɪm 'ɡʌnz] — наводить орудия на цель  
to figure out ['fɪɡəraʊt] — вычислять  
at a fast rate [ətə 'fa:st 'reɪt] — с высокой скоростью  
memory / storage ['meməri'stɒndʒ] — запоминающее устройство  
to store data and instructions — запоминать информацию и команды  
stored program computer — компьютер с занесенной в память программой  
binary code ['baɪnəri'kəʊd] — двоичный код  
condition [kən'dɪʃn] — режим, состояние, условие  
vacuum tube ['vækjuəm'tju:b] — электронная (вакуумная) трубка (лампа)  
to amplify ['æmplɪfaɪ] — усиливать  
to perform computations [prə'fɔ:m kəm'pjʊ'teɪʃn] — выполнять вычисления

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

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

**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.

**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.

**Заполните пропуски необходимыми словами.**

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. The invention of ..... made computers possible to control and ..... electronic signals. 8. Due to ..... computers could perform ..... much faster.

**Переведите предложения или словосочетания, содержащие:**

*А. Инфинитив в функции обстоятельства*

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. Инфинитив в функции определения*

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.

**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. Aikens. 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 содержание: а) 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.

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

British scientists invented a \_\_\_ way of multiplying and dividing.  
mechanical; b) electrical; c) optical

A new branch of mathematics, \_\_\_, was invented in England and Germany independently.

mechanics; b) arithmetic's; c) calculus

A young American clerk invented a means of coding  
\_\_\_ by punched cards.

letters; b) data; c) numbers

Soon punched cards were replaced by \_\_\_ terminals.

printer; b) scanner; c) keyboard

Mark I was the first \_\_\_ computer that could solve mathematical problems.

analog; b) digital; c) mechanical

J. von Neumann simplified his computer by storing information in a \_\_\_ code.

analytical; b) numerical; c) binary

Vacuum tubes could control and \_\_\_ electric signals.

calculate; b) amplify; c) generate

The first generation computers were \_\_\_ and often burned out.

uncomfortable; b) uncommunicative; c) unreliable

Computers of the second generation used \_\_\_ which reduced computational time greatly.

transistors; b) integrated circuits; c) vacuum tubes

10. Due to \_\_\_ the development of the fourth generation



computers became possible.

microelectronics; b) miniaturization; c) microminiaturization

**Выберите правильный перевод предложений, содержащих неличные формы глагола (Infinitive, Gerund, Participle I, Participle II).**

That was the machine provided with the necessary facts about 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 IC were called third generation computers.

а) Компьютеры сконструировали для использования ИС и называли 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 mathematical problems.

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 электронные трубки, выполняли вычисления за миллисекунды.

5. Vacuum tubes to control and amplify electric signals were invented 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 to store 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 for military and scientific purposes.

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

б) Компьютеры создали для выполнения военных и научных вычислений. в) Созданные компьютеры выполняли вычисления военного и научного назначения.

An American clerk invented a means of coding the data by 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.

## Практическое занятие № 44. History OF Computers/ История 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 УК-4.

### Теоретическая часть:

#### FROM THE HISTORY OF COMPUTERS

One of the earliest known computational devices, the abacus was developed. This is a mechanical device composed of a slab (плита) ( abax in Greek) with pebbles (камушки из гальки) (calculi in Greek) strung on wires. The position of the pebbles on each wire determines the value of digit. The abacus can be used to add, subtract, multiply and divide.

In 1812 Charles Babbage, a Professor of Mathematics at Cambridge University, invented the first calculating machine. He decided to build a device which he called an analytical engine. He designed the first programmable computer. It was able to perform only one command.

In 1941 in the United States International Business Machines (IBM) built a machine called Mark 1 to perform calculations for the Manhattan Project, which led towards the development of the atomic bomb. It was a relay computer (релейный). Relays are electromechanical devices which operate by means of electromagnets (электромагниты) and springs (пружины). They were still slow and very noisy.

First generation computers were extremely large and had poor reliability. They used vacuum tubes to control internal operations and required a lot of floor space. These computers could perform thousands of calculations per second. They were much faster than earlier mechanical machines. But they were very slow compared to today's computers. Punched cards were used to enter data into the computer. Card reader was used to translate them into machine language for the computer. The machine language information was often stored on magnetic drums. A splendid example of these first generation computers is ENIAC ( Electronic Numerical Integrator and Calculator). It was over 90 tons. Its 18 thousand vacuum tubes demanded 140 Kilowatts of electrical power. It is enough to supply a block of buildings of respectable size.

In 1948 the transistor came into existence. The second generation of computers was developed. They were smaller and faster. The reason for this extra speed was the use of transistors instead of vacuum tube. The transistor switches flows of electricity as fast as vacuum tubes used in computers. The third generation computers could do a million calculations a second. The integrated circuit (IC) constituted another major step in the growth of computer technology. 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 is the switch or "flip-flop" ("щелчок-шлепок") could be packaged into a single small unit. The chip was a crucial development (решающим шагом) in the accelerating pace of computer technology.

The fourth-generation computers are based on ICs greatly reduced in size due to microminiaturization which means that the circuits are much smaller than before. As many as 1000 tiny circuits fit on to a single chip. The most recent mainframe computers based on very large scale integration are becoming available in the mid- 1980' s. A major advance in the development of computer technology was the creation of microprocessor and microcomputers. The tiny computing devices are able to control complex operations from the control and monitoring operation to playing chess. The fifth-generation computers is based on VLSI (Very Large Scale Integration) and SLSI (Super) technologies, optical fibers, videodisks and artificial intelligence (искусственный интеллект) techniques are incorporated into them.

### Вопросы и задания:

#### **Переведите:**

What is the background of the first development of the computers? What are the first computer applications? Make a list and discuss them:

#### **Прочитайте:**

While reading mark the information:

- I knew this fact ( + )
- I was not right about this ( – )
- This information was unknown for me ( ! )

Compare the information you know and new facts. Discuss it in pairs.

#### **Словарный запас:**

Mind the pronunciation of the following international words. Compare them with Russian words with the same roots:

Mechanical, command, design, atomic bomb, electromagnets, major, data, packaged transistor, accelerating, circuit, relay, technology, monitoring, optical filter, vacuum tube, techniques, microminiaturization, microprocessor, artificial intelligence.

Match the words from two columns to create a phrase and use the phrase in the sentence of your own to speak about history of the computers:

computational	space
poor	data
perform	value
enter flows	of electricity
crucial elimination	of components
major	reliability
require	development
permit	command
switch	device
determine	advance

3. Complete the sentence using one word:

*operate, eliminate, store, determine, enter, subtract, require*

1. The value of digit in abacus ... the position of the pebbles on the wire.

Relays ... by means of electromagnets.  
 Punched cards were used ... data into the computer.  
 Machine language information ... on magnetic drums.  
 With the help of abacus people can ..., multiply and divide.  
 Integrated circuit technology ... some discrete components and integrated the others on a single chip.  
 In the vacuum tubes resistors, inductors and capacitors ... in order to make the whole system work.

**Работа с интернетом:**

Surf the net and be ready to continue the traces of computer history. Find some additional information and facts about the computer development.

**Практическое занятие № 45.**

**Famous People in Computing / Знаменитые люди в истории вычислительной техники**

**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 УК-4.

**Теоретическая часть:**

**STEVE JOBS**

*Steve Jobs co-founded Apple Computers with Steve Wozniak. Under Jobs' guidance, the company pioneered a series of revolutionary technologies, including the iPhone and iPad.* Steven Paul Jobs was born on February 24, 1955, in San Francisco, California, to Joanne Schieble (later Joanne Simpson) and Abdul Fattah "John" Jandali, two University of Wisconsin graduate students who gave their unnamed son up for adoption. As an infant, Steven was adopted by Clara and Paul Jobs and named Steven Paul Jobs. Clara worked as an accountant, and Paul was a Coast Guard veteran and machinist. The family lived in Mountain View, California, within the area that would later become known as Silicon Valley. As a boy, Jobs and his father would work on electronics in the family garage. Paul would show his son how to take apart and reconstruct electronics, a hobby that instilled confidence, tenacity and mechanical skills in young Jobs. While Jobs was always an intelligent and innovative thinker. Jobs was a prankster in elementary school, and his fourth-grade teacher needed to persuade him to study. While Jobs studied at Homestead High School (1971), he was introduced to his future partner, Steve Wozniak. Wozniak was attending the University of California, Berkeley, at the time. In a 2007 interview with *PCWorld*, Wozniak spoke about why he and Jobs clicked so well: "We both loved electronics and the way we used to hook up digital chips," Wozniak said. "Very few people, especially back then, had any idea what chips were, how they worked and what they could do. I had designed many computers, so I was way ahead of him in electronics and computer design, but we still had common interests. We both had pretty much sort of an independent attitude about things in the world. ..."

After high school, Jobs *enrolled* at Reed College in Portland, Oregon. Lacking direction, he dropped out of college after six months and spent the next 18 months dropping in on creative classes at the school. In 1974, Jobs took a position as a video game designer with Atari. In 1976, when Jobs was just 21, he and Wozniak started Apple Computer. The duo started in the Jobs family garage, and funded their entrepreneurial venture by Jobs selling his Volkswagen bus and Wozniak selling his beloved scientific calculator.

Jobs and Wozniak are credited with revolutionizing the computer industry by democratizing the technology and making the machines smaller, cheaper, intuitive and accessible to everyday consumers. Wozniak *conceived* a series of user-friendly personal computers, and – with Jobs in charge of marketing – Apple initially marketed the computers for \$666.66 each. The Apple I earned the corporation around \$774,000. Three years after the release of Apple's second model, the Apple II, the company's sales *increased* by 700 percent, to \$139 million. In 1980, Apple Computer became a publicly traded company, with a market value of \$1.2 billion by the end of its very first day of trading. Jobs looked to marketing expert John Sculley of Pepsi-Cola to help fill the role of Apple's president. However, the next several products from Apple suffered significant design *flaws*, resulting in recalls and consumer disappointment. IBM suddenly surpassed Apple in sales, and Apple had to compete with an IBM/PC –dominated business world.

In 1985, Jobs resigned as Apple's CEO to begin a new hardware and software company called NeXT, Inc. The following year Jobs *purchased* an animation company from George Lucas, which later became Pixar Animation Studios. Believing in Pixar's potential, Jobs initially invested \$50 million of his own money in the company. Pixar Studios went on to produce wildly popular animation films such as *Toy Story*, *Finding Nemo* and *The Incredibles*. Pixar's films have netted \$4 billion. The studio merged with Walt Disney in 2006, making Steve Jobs Disney's largest shareholder. Apple eventually bought the company in 1996 for \$429 million. The following year, Jobs returned to his post as Apple's CEO. With a new management team, altered stock options and a self-imposed annual salary of \$1 a year, Jobs put Apple back on track. His *ingenious* products such as the iMac, effective branding campaigns and stylish designs caught the attention of consumers once again.

Apple introduced such revolutionary products as the MacBook Air, iPod and iPhone, all of which have dictated the evolution of modern technology. In 2003, Jobs discovered that he had a neuroendocrine tumor, a rare but operable form of pancreatic cancer. Instead of surgery, Jobs chose to alter his pescovegetarian diet while weighing Eastern treatment options. For nine months, Jobs postponed surgery, making Apple's board of directors nervous. In 2004, he had a successful surgery to remove the pancreatic tumor. True to form, in *subsequent* years Jobs disclosed little about his health. On October 5, 2011, Apple Inc. announced that its co-founder had passed away. After battling pancreatic cancer for nearly a decade, Steve Jobs died in Palo Alto. He was 56 years old.

### **Вопросы задания:**

#### **1. Групповая работа:**

Collect information about the person from the text.

What does he do?

What is his background?

What are his traits of character?

You can use some expressions describing this person:

*entrepreneur, marketer, inventor, chairman, CEO, charismatic, music industries, animation studio, laser printers, smart phones, diagnosis, health, death*

**Сравните известные вам факты и новую информацию. Обсудите эту информацию в парах.**

#### **Словарный запас:**

Match the words from two columns to create a phrase and use the phrase in the sentence of your own to speak about Steve Jobs.

independent	sales
entrepreneurial	of marketing
accessible	disappointment
market	attitude
branding	value
in charge	to consumers
increase	campaign
consumer	venture

2. Find words in the article which mean:

*train, joker, induce, join, devise, raise, shortcoming, acquire, creative, following*

**Работа с интернетом:**

Surf the net and be ready to tell about other famous people in IT sphere. Present the information you found to your group mates.

**Практическое занятие № 46.**  
**Computer Security / Компьютерная безопасность**

**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 УК-4.

**Теоретическая часть:**  
**Latest Press Releases**

Former Antelope Man Sentenced to 20 Months in Prison for *Fraudulently Obtaining* Microsoft Software: Defendant Cracked Code Needed to Activate Software Causing More than \$500,000 in Losses (January 25, 2014)

Anderson Man *Charged with Criminal Copyright Infringement* (December 28, 2013)

Defendant *Sentenced in Online Piracy Crackdown* (December 19, 2013)

Two Michigan Residents *Plead Guilty to Criminal Copyright Infringement* (December 15, 2013)

Former Chinese National *Charged with Stealing* Military Application Trade Secrets from Silicon Valley Firm to Benefit Governments of Thailand, Malaysia, and China: Third Foreign Economic *Espionage Indictment* in the United States Since the Enactment

of Economic Espionage Act of 1996; Source Code Used for Military Combat Simulation and *Banned* for Export Without License (December 14, 2012)

Utah Man Sentenced to 24 Months in Prison for Bringing Down Wireless Internet Services (December 14, 2012)

Vermilion, Ohio Man Charged with Wire *Fraud* (December 14, 2013)

Hollywood *Movie Pirate* Sentenced to 7 Years in Prison for *Copyright Infringement* and *Escape* (December 1, 2012)

Former Vancouver Area Man Sentenced to Five Years in Prison for Conspiracy Involving Counterfeit Software and *Money Laundering*: Web of Companies Sold up to \$20 million of Microsoft Software with *Altered Licenses* (November 29, 2013)



**Вопросы и задания:**

***Переведите:***

Fraud  
Copyright infringement  
Piracy crackdown  
Stealing  
Espionage  
Money laundering  
Movie piracy

***Прочитайте:***

Here you can find extracts from different Internet articles:

Look through these announcements and add other types of crimes to the table given above. Identity theft is when someone uses, without permission, your personal information in order to commit any frauds or crimes. Identity theft is a *felony* that is becoming more and more common. That is because some of us are not very careful with personal...

This is the age of plastic money. It's not uncommon for the typical consumer in the western world to go weeks at a time without ever handling a coin or bill. Everything we need is available to us with the simple 'swik-swik' sound of a credit card sliding...

It's the start of an Interpol for the Internet. The Federal Trade Commission soon will go global in its hunt for spammers, phishers and other online scammers. President Bush signed a bill Friday that gives the commission broader authority to pursue...

*Ensuring* security on your computer that runs Windows is a delicate and complicated business. The ever-menacing threats of viruses, spyware, phishing is always on the rise. Your valuable data is always at risk. So, how do you keep yourself safe? Here's a...



MARK COLVIN: Millions worldwide have *embraced* internet banking, but so have virtual bank robbers. Financial institutions are dealing with more cyberattacks than ever before. The scams are known as phishing, or sometimes spearfishing, and they're...

The Metasploit Project takes *penetration* testing to a whole new level, not only finding vulnerabilities in applications, but also providing exploit code that so called white hat and black hat hackers alike can use to test the real-world implications of...

**Словарный запас:**

1. Put the correct preposition:

The fraud was sentenced ... one year in prison.

The man was charged ... movie piracy.

Two Chicago Residents Plead Guilty ... Criminal Copyright Infringement.

Taking into consideration threats ... viruses the company install anti-virus program.

2. Find synonyms for the following words. Use them in the sentence of your own:

*Accuse, convict, contravene, crime, guarantee, avail oneself, get in*

3. Look through your list of computer offences and decide which are major and which are minor. Think of appropriate punishment for each offence.

Punishments:

to be sentenced to 1/5/10 years imprisonment

to be sent to prison

to be fined a large/small amount of money

to be given a suspended sentence

to do community service

to be given a warning

to be on probation

to provide with psychiatric treatment

**Прочитайте:**

What can we do to stop computer crimes?

What other threats can a computer user encounter?

Group work:

Divide in groups and find possible ways of solution to the problems of computer security.

Mosaic of problems

**Работа с интернетом:**

Imagine that you should take part in National Computer Security Project. You are an expert in computer security.

Write an article with your solutions to this problem. Make a list of suggestions and explain their advantages.

## РАЗДЕЛ 8: PROGRAMMING/ ПРОГРАММИРОВАНИЕ

### Практическое занятие № 47.

#### What is Programming? / 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 УК-4.

### **Теоретическая часть:**

#### **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. The essence of computer programming is the encoding of the program for the computer by means of algorithms. 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'kweɪʃən] — уравнение, приравнивание

list of instructions — перечень команд

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

appropriate sequence [ə'prɒpriət 'sɪkwəns] — необходимая (требуемая) последовательность

program logic — логическая последовательность выполнения программы

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

flowcharting — построение блок-схемы pictorial representation — наглядное представление

predefined symbols [pri'di'faɪnd 'sɪmbəlz] — заранее заданные символы

specifics [spə'sɪfiks] — специальные черты; характерные

особенности emplate [ɪm'pleɪt] — шаблон; маска; образец; эталон

pseudocode ['psju:dəu'kəʊd] — псевдокод; псевдо программа

burden ['bɜ:dən] — издержки, затраты

programming rules — правила программирования

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

emphasize ['emfəsaɪz] — выделять; подчеркивать

top-down approach — принцип нисходящей разработки  
looping logic — логическая схема выполнения (операций) в цикле

**Вопросы и задания:**

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

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?

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

Совокупность закодированных команд; 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; псевдо программа; без издержек; выделять принцип нисходящей обработки; расходовать меньше времени; логическая схема выполнения операций в цикле; необходимая последовательность операций.

**Подберите из предложенных ниже русских словосочетаний значения следующих терминов на английском языке:**

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.

**Переведите предложения, содержащие сослагательное наклонение.**

I should 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 algorithm 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. I wish it was 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 light amplification by stimulated emission of radiation. 10. I wished you had mentioned these facts while the subject was being discussed.

**Выполните письменный перевод текста по вариантам.**

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.

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.

What is memory?

What is the function of memory?

What are the main parts of memory?

What are advantages and disadvantages of a storage unit?

What are their functions?

What are performance characteristics of the main and secondary memory?

What units are performance characteristics measured by?

План в назывной форме

The definition of memory.

The main functions of memory.

Classification of memory.

Advantages and disadvantages of memory components.

The functions of memory components.

Performance characteristics of memory.

The units for measuring the performance characteristics of memory.

План в тезисной форме.

Memory is one of the basic components of the computer.

Memory stores initial data, intermediate and final results.

It produces the information needed to other devices of the computer.

Memory consists of the main (internal) and the secondary (external) storage.

The main memory has high speed, but small capacity; the secondary memory possesses lower speed but greater capacity.

The main memory performs computation; the secondary memory provides information sequentially, step by step.

The performance characteristics — speed, capacity and reliability — are measured by cycles, binary digits and the number of failures per unit of time.

### **Практическое занятие № 48.**

#### **Programming Languages/ 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 УК-4.

#### **Теоретическая часть:**

##### **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. Programming languages have improved throughout the years, just as computer hardware has improved. They have progressed from machine-oriented languages that use strings of binary 1s 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 Business-Oriented Language. 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 sentence-like 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 stand 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**

programming language — язык программирования

coded form — кодированный вид; кодированное представление

to improve — улучшать, совершенствовать machine-oriented

language — машинно-ориентированный язык

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:**

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

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. What capabilities has PL/I?

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

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.

**Переведите условные сложноподчиненные предложения. Обратите внимание на форму выражения разных типов условия.**

I. 1. If you try very hard you can master any language. 2. If you want to master any language you must know at least three thousand words. 3. You **will** improve your pronunciation if you read 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 write your test successfully. 6. If you or I add up two numbers of six figures 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 the earth didn't rotate it wouldn't have the shape of a ball. 3. If I had the time I should help you to solve the problem. But I must be off. 4. I should translate the article without difficulty if I knew English well. 5. If I were in your place I should learn to speak English fluently. 6. Were you asked to explain why addition is performed the way it is; you would probably have to think for a while 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 your examinations more successfully. 5. Had the manager had this information before, he would have acted differently. 6. The binary system is particularly appropriate to the nature of an electric machine; if it had not existed, computer designers would have had to invent it.

**Выполните перевод следующих текстов письменно по вариантам.**

### **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.

**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 schedule 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, schedule 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 data held in the computer's memory — in order to find the cause of logic errors.



## **Практическое занятие № 49. Program Design and Computer Languages / Создание программ и 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 УК-4.

### **Теоретическая часть:**

#### **Program design and computer languages**

Program designing begins with deciding the output and framing the program logic. The design is then broken down into modules to facilitate programming. All computer languages have a vocabulary of their own. If a programmer does not strictly follow the syntax of a programming language, the computer will not understand the commands given in the program. Programming languages generally fall into two categories – low-level languages and high-level languages. Machine languages and assembly languages are low-level languages. Low-level languages are hardware friendly.

First generation languages and second generation languages are regarded as low level languages, whereas the languages of higher generations are regarded as high-level languages. A machine language consists of binary numbers (0s and 1s) which respond directly to the on and off electrical pulses generated by the computer.

It is also called the first generation programming language. Assembly language is easier to use than machine language as a programmer can use symbols to sum up program instructions. High-level languages free programmers from the need to know the details of a processor, but they still require programmers to specify the procedure to be followed to solve a problem.

Fourth-generation languages free programmers from worrying about the procedures to be followed to solve a problem, but most of them are restricted to the use of accessing databases. An application generator facilitates the development of applications. It includes defining input transactions, editing such transactions, creating a database, updating files, generating reports, and processing queries.

The fifth generation programming languages are designed to enable the computer to solve a problem. These languages incorporate concepts like artificial intelligence, expert systems, etc. Language translators convert a source code into an object code. The two types of translators are compilers and interpreters. A compiler is a translation program which translates the entire source code of a high-level programming language into an object code and creates an object file. An interpreter is a program that executes the instructions which are written in a high-level language. Different types of programming languages serve different purposes. Some of the programming languages which are popularly used include COBOL, BASIC, Pascal, C, Ada, C++, Visual Basic and Java.

Object-oriented programming is a programming technique designed to provide component reusability. The basic concepts of object-oriented programming are objects and classes, abstraction, encapsulation, polymorphism, and inheritance.

**Вопросы и задания:**

Прочитайте и переведите текст «Дизайн программы и компьютерные языки» и ответьте на вопросы:

- What are the two types of translators mentioned in the text?  
Do computers understand human languages? Why/ why not?  
How many high-level computer languages are mentioned?  
What are the features of low-level languages?

**Шаги в программировании. Сопоставьте слова 1-5 с определениями а-е.**

- 1 flowchart
  - 2 source code
  - 3 compiler
  - 4 machine code
  - 5 debugging
- 
- a Program instructions written in a particular computer language
  - b The techniques of detecting and correcting errors (or bugs) which may occur in programs
  - c A diagram representing the successive logical steps of the program
  - d A special program which converts the source program into machine code – the only language understood by the processor
  - e The basic instructions understood by computers; it consists of 1s and 0s (binary code)

**Словообразование. Посмотрите на слова в коробках. Это существительные, глаголы или прилагательные? Напишите n., Прил. или v. рядом с каждым словом. Там может быть более одного возможного ответа. Дополните предложения словами из ящиков.**

program \_\_\_\_\_ programmers \_\_\_\_\_ programming \_\_\_\_\_ programmable \_\_\_\_\_

- 1 \_\_\_\_\_ is the process of writing a program using a computer language.
- 2 A computer \_\_\_\_\_ is a set of instructions that tells the computer how to do a specific task.
- 3 Most computer \_\_\_\_\_ make a plan of the program before they write it.
- 4 A \_\_\_\_\_ keyboard allows the user to configure the layout and meaning of the keys.

compile \_\_\_\_\_ compiler \_\_\_\_\_ compilation \_\_\_\_\_

- 5 Programs written in a high-level language require \_\_\_\_\_ – that is, translation into machine code, the language understood by the processor.
- 6 A source program is converted into machine code by software called a \_\_\_\_\_.
- 7 Programmers usually \_\_\_\_\_ their programs to generate an object program and diagnose possible errors.

bug \_\_\_\_\_ debug \_\_\_\_\_ debugger \_\_\_\_\_ debugging \_\_\_\_\_

- 8 Any error or malfunction of a computer program is known as a \_\_\_\_\_.
- 9 A \_\_\_\_\_ is a program used to test and \_\_\_\_\_ other programs.
- 10 The process of going through the code to identify the cause of errors and fixing them is called \_\_\_\_\_.

**Работать в парах. Студент А читает о VisualBASIC, Студент Б читает о VoiceXML. Расскажите партнеру о языке, о котором вы только что читали.**

Student A	Student B
<p><b>Visual BASIC</b> was developed by Microsoft in 1990. The name <b>BASIC</b> stands for Beginner's All-purpose Symbolic Instruction Code. The adjective <b>Visual</b> refers to the technique used to create a graphical user interface. Instead of writing a lot of instructions to describe interface elements, you just add pre-defined objects such as buttons, icons and dialog boxes. It enables programmers to create a variety of Windows applications.</p>	<p><b>VoiceXML</b> (EXtensible Markup Language) was created in 2000 to make web content accessible via the telephone. For input, it uses voice recognition. For output, it uses pre-recorded audio content and text-to-speech.</p> <p>Applications:</p> <ul style="list-style-type: none"><li>• voice portals, where you can hear information about sports, news, traffic, etc.</li><li>• voice-enabled intranets (private networks)</li><li>• voice e-commerce</li><li>• home appliances controlled by voice</li></ul>

### **Практическоезаяние № 50. Java / Java**

**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 УК-4.

**Теоретическаячасть:**

**TheJavalanguage**

Java is a programming language developed by Sun Microsystems, specially designed to run on the Web. Java programs (called **applets**) let you watch animated characters and moving text, play music, and interact with information on the screen (for example, control animations and select options).

### Characteristics of the Java language

Java is an **object-oriented** language, similar to C++, but more dynamic and simplified to eliminate possible programming errors. A Java program is both compiled and interpreted (see Unit 24). First, the source code (a file with a **.java** extension) is compiled and converted into a format called bytecode (a file with a **.class** extension), which can then be executed by a Java interpreter (see Fig. 1). Compiled Java code can run on most computers because there are Java interpreters, known as **Java Virtual Machines**, for most operating systems.

Java is **multi-threaded**, meaning a Java program can have multiple threads (parts) – that is, many different things processing independently and continuously. This enables the program to make the best use of available CPU power.

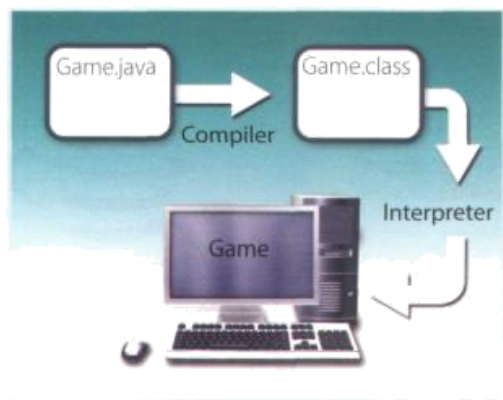


Fig. 1

### Why is Java popular?

Most programmers like Java because it allows them to write applets which make web pages more interactive and attractive. They can create graphical objects (for example, bar charts and diagrams) and new controls (for example, check boxes and push buttons with special properties). A web page that uses Java can have sounds that play in real time, music that plays in the background, cartoon-style animations, real-time video and interactive games.

The Java Micro Edition platform (**Java ME**) is used in mobile devices. It provides flexible tools to create applications that run on mobile phones, PDAs, TV set-top boxes and printers. Nowadays, most phones are configured to use Java games.

### Alternatives to Java

One alternative to Java is Microsoft's **C#**, pronounced 'C sharp', a **.NET** language based on C++ with elements from Visual Basic and Java. There are no substantial differences between C# and Java. When software developers do measurements on pieces of code, sometimes Java is faster, sometimes C# is.

Another competitor is Adobe **Flash** technology, which supports graphics, a scripting language called ActionScript, and the streaming of audio and video. Flash is used to create animation and advertisements, to integrate video into web pages, and to develop rich internet applications such as portals. **Flash files**, traditionally called **flash movies**, have a **.swf** file extension. They may be an object on a web page or be played in the stand-alone Flash Player.

### Вопросыизадания:

Прочитайте и переведите текст «Язык Java». Эти утверждения о Java все ложные. Исправьте их, используя информацию из текста.

- 1 Java was invented by Microsoft.
- 2 With the interpreter, a program is first converted into Java bytecodes.
- 3 Java is not compatible with most computing platforms.
- 4 The Java language is single-threaded, one part executing at a time.
- 5 Java has no competitors.
- 6 Flash files are called *animations*.

Сопоставьте слова (1-6) со словами (a-f), чтобы сделать технические термины из текста.

- |               |             |          |            |
|---------------|-------------|----------|------------|
| 1 Java        | 4 web       | a applet | d system   |
| 2 operating   | 5 source    | b page   | e object   |
| 3 programming | 6 graphical | c code   | f language |

Дополните предложения словами из коробки.

interpreted   animated   configured   used   pronounced   object-oriented   compiled

- 1 Java lets you watch \_\_\_\_\_ characters on web pages.
- 2 Java is an \_\_\_\_\_ language, similar to C++ but more dynamic.
- 3 First, the source code of a Java program is \_\_\_\_\_ into an intermediate format called *bytecode*. This is then \_\_\_\_\_ by any system possessing a Java interpreter.
- 4 The Java ME platform is widely \_\_\_\_\_ in mobile devices.
- 5 Nowadays, most mobile phones are \_\_\_\_\_ to use Java games.
- 6 Microsoft's C# is a simplified version of C and C++ for the Web. It's \_\_\_\_\_ 'C sharp'.

**Делайте заметки о различных этапах истории вашего компьютера. Добавьте больше этапов, если хотите.**

*Example: 2000 played my first computer game. It was...*

Possible stages:

- First computer game
- First computer lesson at school/college
- First programming language learnt
- First software used
- First computer course/qualification
- First job involving computers
- First steps on the Internet
- First chat online

### **Практическое занятие № 51. AppleVSMicrosoft / Apple против Microsoft**

**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 УК-4.

#### **Теоретическая часть:**

#### **MACS® AND PCS**

As Apple® grows in popularity, the Mac® versus PC debate continues. Many businesses experience trouble choosing between the two. However, businesses must realize that each computer is suited for different needs. The two differ most in their operating systems. With PC you have a variety of OS options from Microsoft® and other sources. Macs® come with one of the proprietary Apple® OSes like OS X®. You can install Windows® on a Mac®, but many



users prefer the Mac® OS regardless. Macs® have proven themselves vital in publishing, particularly the prepress process. Mac® has superior typography and color matching. Once printed, products look exactly as good as they do on the computer screen. Meanwhile, PCs are noted for their fast processing speed and adaptability. Users can customize a PC to their needs. Additionally, their video subsystems are more powerful. This makes PCs desirable for game designers and others who need advanced graphics. However, both computers have their limitations. While PCs are cheaper, they are also more susceptible to viruses. Macs® usually cost more but are less susceptible to computer viruses. However, Macs® tend to have fewer third-party software options than PCs. Businesses need to consider such concerns and make the right decisions when buying computers for their companies.



### Вопросы и задания:

#### Обсудите в парах:

Why do people prefer one operating system to another?

What operating system do you like? Give your reasons.

What products does the Microsoft Company issue?

What products does the Apple Company have?

Product of what company do you prefer?

**Заполните таблицу с аргументами в пользу продуктов каждой компании:**

MICROSOFT	APPLE
<ul style="list-style-type: none"> <li>.</li> <li>.</li> <li>.</li> <li>.</li> <li>.</li> </ul>	<ul style="list-style-type: none"> <li>.</li> <li>.</li> <li>.</li> <li>.</li> <li>.</li> </ul>

### 3. Словарный запас:

#### 3.1. Match the words with the definition.

1. Apple®	a) company that creates the most common PC operating system
2. Windows®	b) part of the computer that creates visuals
3. customize	c) system that is likely to be harmed by a virus
4. OS X®	d) operating system for PCs
5. processing speed	e) changing a computer for your needs
6. video subsystem	f) company that creates Macs®

7. Microsoft®	g) operating system for Macs®
8. susceptible system	h) a measurement of how quickly a computer works

3.2. Fill in the blanks with the correct words: *prepress, color matching, PC, topography*

A ..... comes with OS X®.

Publishing software is needed for the ..... process.

Good ..... means anything printed out looks like what's on screen.

I'm getting a ..... because I like the Windows® OS.

The ..... on his computer includes hundreds of fonts.

#### **Работа с интернетом:**

Surf the net and find additional arguments in favor of each company.

Group work:

Make two groups. One group will present the interest of MICROSOFT

Company another group will represent APPLE Corporation. Collect arguments in favor of each company and be ready for the cross discussion.

### **Практическое занятие № 52. Cloud Technology / Облачное хранилище 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 УК-4.

#### **Теоретическая часть:**

##### **What is Cloud Computing and why does your small business need it?**

Cloud computing is a way to *increase capabilities* on the fly without investing in a new infrastructure, training new personnel, or licensing new software. Small businesses *benefit from Cloud computing* by not having to *deploy physical infrastructure* like file and e-mail servers, storage systems or shrink-wrapped software. Cloud computing is a broad umbrella that includes Software-as-a-Service where a specific application or service is *offered to a customer as a subscription*. **Dropbox**, **Salesforce.com**, and **QuickBooks** are all examples of SaaS. SaaS provides a way of *delivering a host of software* and technical services that would usually be cost-prohibitive and difficult to manage as on premise, local solutions.

Cloud computing has come a long way and is now *mainstream technology* for businesses. The cloud does for IT as **UPS** and **Federal Express** did for the shipping industry. Cloud computing capabilities deliver *a plethora of network technology*. Small businesses are most likely to not have an IT staff or technical, *in house expert*. Some companies don't even know how to ask about their company's tech infrastructure. Joining the cloud can help reduce these stress of all the *IT stuff*.

In The Cloud

The different types of models of cloud are: **public, private, community and hybrid**.

Public cloud is available to the general public over the Internet. It's a "gamechanger" for small businesses and gives them access to enterprise-level applications.

Private cloud is within a corporate firewall. It is reserved for larger companies that have their own IT staff and data centers.

Community cloud is shared between different organizations. It's a multi-tenant infrastructure with a pay-as-you-go billing structure.

Hybrid cloud is a combination of the three. This cloud addresses configuration management, change control, security and budgeting.

**SaaS (Software as a Service)** is predominantly used for office productivity like email, work processing, number crunching, and online file sharing.

**IaaS (Infrastructure as a Service)** functions like storage and computing. It is used to store intellectual property like documents, drawings, applications and code proprietary to a business.

**PaaS (Platform as a Service)** is used to develop and run a website in the cloud or build applications. There is a huge opportunity for growth of a small business when using cloud services. Cloud computing *encompasses subscription-based or pay-per-use service*, that in real time or over the Internet, extends IT's existing capabilities. Cloud computing is still at an early stage, with a crew of providers large and small. It delivers not only cloud-based services from storage to spam filtering but presents a utility-style infrastructure for your business.

### Вопросы задания:

#### Ответьте на вопросы:

What is cloud computing?

How can cloud technology help people?

What are the benefits of this online service?

What are the downsides of this technology?

Do you use this technology? Do you like it? Why?

What are the benefits of the cloud technology for businesses?

What are the differences between the conventional and the cloud IT services?



### Словарный запас:

2.1. Match the words from two columns to create a phrase and use the phrase in the sentence of your own to speak about cloud technology.

increase	host
benefit	of network technology
deploy	capability
offer	from cloud computing
deliver	technology
mainstream	pay-per-use service



encompass	as a subscription
plethora	infrastructure

2.2. Fill in the blanks with the correct word:

*storage, SaaS, applications, IaaS, spam filtering, PaaS, subscription*

Cloud technology delivers cloud-based ..... and ..... services.

Public cloud gives businesses access to enterprise-level ..... functions like storage and computing.

..... is used to develop and run a website in the cloud or build applications.

..... is used for office productivity like email, work processing, number crunching, and online file sharing.

Cloud computing provides ..... based service.

### **Работа с интернетом:**

Surf the net and find information about the advantages and disadvantages of cloud technology.

Group work:

Make two groups. One group will be in favor of cloud technology another group will be against it. Collect your arguments and be ready for the cross discussion.

### **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.)

What are the main functional units of a digital computer?

What types of storage do you know?

What is a binary number system?

What is storage media?

How is storage capacity measured (in what units)?

What do you know of electronic memories?

What can you say about electromechanical memories?

How do you understand the term "access time"?

What is RAM/ROM?

What storage devices do you know?

What is the function of the CPU?

What two functional units does the CPU consist of?

What components does control unit include?

What devices has the arithmetic-logical unit?

What is the ALU function?

What is the function of CU?

What is the heart (brain) of a microprocessor?

What is the purpose of input devices?

How do you understand the term "input-output environment"?

What groups can I/O devices be classified according to their speed?

Name devices used for inputting information.

What is touch pad?

What is a scanner used for?

What types of printers do you know?

When did the first personal computer appear?

What differs PC from large computer systems?

What is a personal computer?

What are the main spheres of PC applications?

What professions are in great need of computers?  
What is modem and what is it used for?  
What is programming?  
What is a program?  
What techniques for planning the program logic do you know?  
What do you understand by pseudocode?  
What is a code?  
What is the foundation of any programming language?  
What programming languages do you know?  
What is FORTRAN used for? Decode it.  
What does COBOL serve for? Decode it.  
What is WWW?

## СПИСОК РЕКОМЕНДУЕМОЙ

### ЛИТЕРАТУРЫ Перечень основной литературы:

Радовель, В.А. Английский язык: основы компьютерной грамотности: учебное пособие / В.А. Радовель – Изд. 11-е. – Ростов н/Д: Феникс, 2012. – 219 с.

Нурутдинова, А.Р. Английский язык для информационных технологий. Часть I: учебное пособие по формированию иноязычной профессиональной компетенции студентов технических специальностей / А.Р. Нурутдинова. – Электрон. текстовые данные. – Казань: Казанский национальный исследовательский технологический университет, 2013. – 300 с. – Режим доступа: <http://www.biblioclub.ru> – ЭБС «Университетская библиотека онлайн»

Нурутдинова, А.Р. Английский язык для информационных технологий. Часть II: учебное пособие / А.Р. Нурутдинова. – Электрон. текстовые данные. – Казань: Казанский национальный исследовательский технологический университет, 2013. – 314 с. – Режим доступа: <http://www.biblioclub.ru> – ЭБС «Университетская библиотека онлайн»

### Перечень дополнительной литературы:

Бжиская, Ю.В. Английский язык. Информационные системы и технологии: [учеб. пособие] / Ю.В. Бжиская, Е.В. Краснова. – 2-е изд. – Ростов н/Д : Феникс, 2013. – 248 с.

Сомко, А.С., Федорова, Е.А. Профессиональный иностранный язык для специалистов в области компьютерной безопасности. – М.: Университет ИТМО, 2016. – Режим доступа: <http://www.iprbookshop.ru> – ЭБС «IPRbooks»

### Перечень ресурсов информационно-телекоммуникационной сети «Интернет», необходимых для освоения дисциплины:

<http://www.biblioclub.ru>  
<http://www.iprbookshop.ru>  
<http://www.catalog.ncstu.ru>

## GLOSSARY

**above the fold** – above the fold on a website means that the object is visible without scrolling down after the page has loaded.

**ACC** – a music file format that is of higher quality than MP3.

**acquisition time** – measures how long a GPS takes to determine location.

**active matrix displays** – a type of a screen that produces high quality and clear images.

**actuator** – a piece of equipment that uses energy to make a robot move.

**ad product** – an advertising opportunity such as a banner that is located on a

**affiliate** – a person or business that directs Internet traffic to a business’s website in exchange for a percentage of sales.

**agent** – a computer that observes and reacts to the conditions in a certain environment.

**algorithm** – a rule or a set of rules that provides steps to take or questions to ask in order to solve a problem.

**anchor** – a word, phrase, or image that includes a hyperlink and can be used for navigation.

**animated GIF** – a combination of multiple GIF files in one advertisement to create animation.

**anti-antivirus virus** – a computer virus that attacks and often disables anti-virus software.

**antivirus software** – a program that locates and eliminates computer viruses.

**app** – an application with a specific function that users download into their phones.

**appearance** – is the way that a web page looks.

**Apple®** – the company that produces Macs® and other computing products.

**applet** – a small application that is embedded in a webpage.

**array** – a group of disk drives that are connected and used as a single unit.

**Artificial Intelligence** – the branch of science that seeks to create computers and robots that can reason, learn and solve problems independently.

**Assembler** – a low level programming language that translates between computer programs.

**attachment** – a file that is sent with an e-mail.

**attack** – an attempt to get through computer security.

**audit log** – a record of who has accessed a computer system and what actions they took.

**authenticate** – to make sure that something is legitimate.

**automatic document feeder (ADF)** – a device that feeds multiple pages into a scanner.

**automation** – the use of programmed machines to perform tasks without human assistance.

**avatar** – an image in a computer game that represents a person.

**back end** – something that occurs at the end of a project or job.

**backdoor** – a hidden way to get over security in computers and programs, sometimes internationally created.

**backup** – to create a duplicate copy of data that is stores on a separate hard drive or computer system to prevent the loss of the data.

**bandwidth** – a measurement of an amount of information that a computer network can send or receive.

**banner** – a rectangular graphic on a website that advertises a business.

**barcode** – an arrangement of lines and spaces that represent data.

**Basecamp®** – a program offered by the company 37 signals that organizes projects and can be accessed by multiple users simultaneously.

**BASIC** – a high level programming language that was invented in the 1960s and is declining in popularity at present.

**bill pay** – a service provided by banks that allows customers to pay bills online automatically.

**bit** – the smallest unit of computer data.

**bit size** – measures the number of bits that the CPU can access at once.

**bitmapped graphic** – an image that is made up of many small points.

**bitrate** – a measurement of the amount of data that is processed.

**block** – means to prevent access to something.

**blog** – a personal website that is maintained by an individual.

**blog** – a website where a person writes posts about his feelings, thoughts, activities, etc.

**Bluetooth®** – a wireless network that connects phone with other devices, such as a computer.

**Boolean operator** – narrows a database search with words such as “and”, “or” and “not”.

**broadband** – a system that allows computers to transfer large amounts of information.

**bug** – a flaw in a computer program.

**bus speed** – a computer’s bus speed measures how many times the CPU can access a group of bits per second (it is measured in MHz).

**C** - a programming language that is used in program operating systems.

**C#** - a programming language that was invented as an alternative to Java.

**C++** – a programming language that adds object-oriented programming capabilities to C.

**CAD (Computer-Aided Design)** – the use of a computer to design things such as machines or buildings.

**calibration** – the act of adjusting printers and scanners to display colors correctly.

**call waiting** – a feature of some cell phones. It alerts you that someone is calling while you are on the line with someone else.

**caller ID** – a feature of some cell phones that tells you the name and number of the person calling you.

**capacity** – the amount of space an MP3 player has to store files.

**card scanning** – practice of capturing personal information stored on credit or debit cards, or passports.

**case** – an enclosure that holds the computer's components.

**case based reasoning** – the process of using information from previous experiences to solve new problems.

**CAT-5 cables** – standard cables (category 5) that connect computers to networks.

**catalog** – an inventory of books in a library.

**CBT (Computer-Based Training)** – the use of a computer to train employees.

**CCD (charge-coupled device)** – a light-sensitive chip that is used when capturing digital images.

**CDN (content delivery network)** – a system of computers on a network containing copies of data that nearby users can access.

**CD-R** – a blank CD that can have information written on it only once.

**CD-RW** – a blank CD that can have information written on it multiple times.

**cell** – a unit of a spreadsheet that holds a piece of information.

**cell phone** – a wireless phone that sends and receives data at a certain frequency of energy.

**centralize** – to bring things from multiple places and make them available in one location.

**click tracking** – the process of counting and keeping track of the number of clicks an advertisement receives.

**click-through rate** – the ratio of clicked advertisements to the number of advertisements that are viewed.

**clip art** – electronic artwork that can be used in publications.

**cloud computing** – the use of the Internet for software and other resources.

**code** – a set of words and signs that give instructions to a computer.

**codec** – a piece of videoconferencing equipment that codes signals going out and reads signals coming in.

**coding** – the programming language that makes up a website.

**color matching** – the ability to create colors as users see them on the screen.

**color-coding** – practice of labeling things with different colors in order to tell them apart.

**command line** – a word or phrase that makes a computer perform an operation.

**commission** – the amount of money charged by a website for hosting advertisements.

**compatibility** – the ability of one program or file to work with a different program.

**compiler** – changes human-readable source code into machine code that a CPU can understand.

**component** – a part of something bigger.

**Computer Aided Manufacturing** – the use of computers to control production equipment.

**computer language or programming language** – used by computer programmers to create instructions that a computer can understand.

**computer version** – field and technology of making computers that have the ability to see.

**configuration** – a group of settings that control how information is sent and received on a network.

**configure** – means to modify something or arrange it so that it works in a certain way.

**content** – material on a web page including text and graphics.

**cover letter** – a document that explains why a person is applying for a job and why that person believes he or she is qualified for that job.

**CPC** (cost per click-through) – a pricing model wherein rates are charged according to how many thousands of people view the advertisement.

**CPM** (cost per 1,000 impressions) - a pricing model wherein rates are charged according to how many thousands of people view the advertisement.

**CPU** – Central Processing Unit.

**crop** – a cut off unwanted parts of an image.

**CSS** (cascading style sheets) – a simple language that decides how a web page looks.

**customize** – means to change something to meet individual needs and purposes.

**cyber** – something related to computers or the Internet.

**cyber-criminal** – a person who uses computers and the Internet to commit crimes such as identity theft and fraud.

**cycle** – to cycle a device on a network means to turn it off and then turn it on again or to unplug it from its power source.

**dashboard** – a display on a computer that shows commonly or recently used files and programs.

**data** – the quantities, characters, or symbols on which operations are performed by a computer, being stored and transmitted in the form of electrical signals and recorded on magnetic, optical, or mechanical recording media.

**data compression** – the process of storing information using less storage space by reducing the number of bits it takes up.

**data plan** – a contract from a cell phone service provider that states what online services are available on a cell phone and how much that transfer of data will cost.

**data processing** – the act of entering, using or manipulating data with computers.

**database** – an organized collection of data in a computer system.

**decode** – a file is to return it to its original format.

**dedicated system** – includes all necessary components of videoconferencing together as a set.

**deployment** – introduction of new software into a group of hardware.

**desktop** – everything that a user sees on a computer screen.

**desktop computer** – a personal computer in a form intended for regular use at a single location desk/table due to its size and power requirements, as opposed to a laptop whose rechargeable battery and compact dimensions allow it to be regularly carried and used in different locations.

**desktop publishing software** – the creation of documents using page layout skills on a personal computer. Desktop publishing software can generate layouts and produce typographic quality text and images comparable to traditional typography and printing.

**detect** – means to discover something.

**DHCP** (Dynamic Host Configuration Protocol) – a system for computer networks to receive IP addresses and other configuration information.

**dial-up** – an Internet connection using a modem and regular telephone lines.

**digital** – electronically stored file as a series of ones and zeros.

**digital camera** – a device that records images to be looked at on a computer.

**digital certificate** - an attachment to an electronic message used for security purposes.

**digital zoom** – it how a digital camera increases the display size of an image subject, reducing image quality.

**disc drive** – reads information from a magnetic spinning disc.

**document** – a file created on a word processing program.

**document sharing** – a feature of some videoconferencing systems that allow everyone participating in the videoconference to look at and edit the same document.

**domain name** – a set of words and letters that identify a company or address in the Internet.

**drag** – to move around files, folders and icons on the desktop.

**duty** – a task that someone is responsible for completing at a job.

**DVD** (Digital Video Disc) – a storage disc that is read by a laser and can store media files such as videos and images.

**e-commerce** – purchase or sale of items in the Internet.

**EDI** (Electronic Data Interchange) – a standardized method for transferring data between different computer systems or computer networks. It is commonly used for e-commerce purposes, such as sending orders to warehouses, tracking shipments, and creating invoices.

**editor** – a program that is used to create and change files.

**egress filter** – prevents harmful software from leaving a network.

**elasticity** – a computer system's ability to gain or lose computer resources as a user sees fit.

**electronic bulletin board** – a shared file that can be used to spread information

**electronic page** – computerized version of a paper page.

**electronic paper** – special digital screen that can be read like paper.

**embedded system** – a combination of hardware and software designed to perform a specific task.

**Encoder** – is a device that converts mechanical information into electronic signals.

**encoding** – changing data so that no one can read it until it is changed again.

**end user** – person that a software program or hardware device is designed for.

**Ethernet network** – a high-speed network that links computers together.

**expansion cards** – extra circuit boards that are used to increase the functions of a computer

**external link** – any link that goes to a different domain.

**Facebook** – the most popular social networking site on the Internet that was conceived by Mark Zuckerberg and officially launched on February 4, 2004.

**false negative** – takes place when anti-virus software incorrectly indicates that an infected file is clean.

**false positive** – takes place when anti-virus software incorrectly indicates that a clean file has been infected with a computer virus.

**fan** – moves cool air into a computer component inside the case.

**FAQ** (Frequency Asked Questions) – a list of common questions with their answers.

**FAQs** (Frequently Asked Questions) – a set of questions and answers that are provided on a website to give information that users commonly want to know.

**fault tolerant** – the ability to continue functioning even though an error has occurred.

**field** – a category in a database that holds a particular type of information.

**file archiving** – the process of organizing computer files in an orderly way which lets users retrieve them easily.

**firewall** – a program that restricts access on a network.

**flash** – a media format that can be used to add videos, animations, and other media to a website.

**folder** – holds and organizes files and documents in a computer.

**font** – the style of typed characters in a document.

**fraud** – an action that results in the loss of another person's property.

**free software license** – allows users to change and distribute programs.

**frequency capping** – the process of ensuring that a specific website visitor does not see the same advertisement an excessive number of times.

**fulfilment** – performing activities to meet a need or requirement, for example, by providing a new IT service, or meeting a service request.

**function** – an intended purpose of a configuration item, person, team, process or IT service. For example, one function of an e-mail service may be to store and forward outgoing mails, while the function of a business process may be to dispatch goods to customers.

**functionality** – the ability of different elements of a website to work together.

**gallery** – a collection of icons or pictures that have been organized in a file or page.

**gap analysis** – activity that compares two sets of data and identifies the differences.

**geo targeting** – the process of showing advertisements in geographical areas where they are relevant.

**graphic communications** – the study of sending and receiving visual messages.

**graphical user interface (GUI)** – an operating system that uses icons to represent programs and files and allow users to access to them.

**GUI** (graphical user interface) – shows how a user interacts with a computer using images and text.

**hacker** – a person who exploits computer hardware and software for their own purposes.

**handheld PC** – a computer that is smaller, slower and less powerful than a laptop and used to browse the Internet and check e-mail.

**hang** – means to prevent a website from loading all the way.

**hard drive** – stores data electronically.

**hardware** – refers to the physical parts of a computer.

**heat sink** – transfers heat away from nearby components of a computer.

**host** – a computer system that has a computer virus attached to it.

**HTML** (Hypertext Markup Language) – a computer language that is used to conduct web sites on to the Internet.

**HTML** (hypertext markup language) – a way to alter the look of text on webpages.

**http** – part of Internet address that allows a computer to connect to the site.

**hyperlink** – a word or image on a web page that you can click on to go to a different web page.

**IaaS** (infrastructure as a service) – delivers such elements as servers and software over the Internet.

**icon** – a picture that represents something on a computer.

**identity theft** – process of stealing another person's personal information and using it for personal goals.

**imbed** – means to become a part of something.

**infect** – means to contaminate a computer with a computer virus.

**information security** – the act or process of keeping information safe and preventing others from seeing it.

**information technology** (IT) – the branch of engineering that deals with the use of computers and telecommunications to retrieve and store and transmit information.

**ingress filter** – prevents harmful software from entering a network.

**install** – means to add a new component or program to a computer or system.

**integrated circuit** – a small chip that has several electronic devices attached to it.

**interactive** – any device that responds to a user's commands.

**interface** – provides a way for a user to interact with a computer.

**Internet** – a worldwide network of computers.

**intruder** – a person or program that attempts to access a network or computer without a permission.

**IP (Internet Protocol) address** – a group of numbers that identify a computer on a network.

**ISP** (Internet Service Provider) – a company that gives its customers access to the Internet, e-mail addresses and data storage.

**JPEG** (Joint Photographic Experts Group) – a kind of a computer file used to store pictures on a computer.

**keyboard** – a set of buttons that is used to enter information into a computer. **key-logger** – a type of Trojan virus that tracks what keystrokes are entered into a computer. **keyword** – a term or phrase that is created to describe a webpage, so that it can be found in a search engine.

**laptop** – a computer that is small enough to be carried around and used anywhere.

**latency** – the time between the end of one computer communication and the start of another.

**layout** – the way that items are arranged on a document.

**LCD** (Liquid Crystal Display) – a type of a display that is created by liquid crystals and that is used in thin monitors.

**Linux®** – a computer operating system.

**Linux® distribution** – a collection of software for Linux®.

**local area network** (LAN) – a network that connects a small group of computers.

**log in** – means to provide a computer security system with the proper identification to use the computer.

**Mac®** – a type of a computer from Apple®.

**macro** – a short keystroke that performs a predetermined action.

**mainframe** – a very powerful computer that can process large amounts of data.

**malware** – a type of malicious, harmful software.

**mask** – means to block information from being viewed.

**maximize** – to make a window fill an entire computer screen or desktop.

**media player**– used to play media such as videos and animations and can be embedded in a web page.

**message board** – an online application that displays and organizes messages from users.

**meta tag** – text that is used in the codes of a web page to provide information about the site to search engines.

**Microsoft Office®**– a software package that offers word processing and spreadsheet programs.

**Microsoft®**– a company that produces the Windows® operating system among other products.

**minimize** – to make a window leave the screen without closing it.

**monitor** – a screen that displays text, video, or images.

**motherboard** – a firm slotted board onto which computer circuitry is attached.

**mouse** – a small device that is used to move the cursor and select items on a computer screen.

**MPEG** – a video format used to compress video into smaller files.

**multimedia** – any type of media used on a webpage, including images, animations, and videos.

**multipoint videoconference** – a videoconference among people in three or more different locations.

**natural language** – use of phrases from everyday speech in search engines.

**navigation** – the act of using and finding things on a website.

**network** – a group of computers that are connected in order to share data or communicate.

**offset lithography** – a common form of printing.

**online** – connection of a computer to the Internet.

**Open Office®**– an open source software package similar to Microsoft Office®.

**open source** – software that can be distributed with the same basic source code.

**open system** – a system that can use many different types of machines.

**operating system (OS)** – software that controls a computer.

**operator** – a symbol in a formula that performs a particular calculation, such as a plus sign (+).

**optic scanner** – a device that reads and records identification labels on medications.

**OS X®** – an operating system from Apple® for Mac computers®.

**oscilloscope** – a device that allows users to view the electrical voltage of a machine.

**overwriting virus** – a computer virus that copies its code over and destroys the files of the original data.

**PaaS (platform as a service)** – a service where users receive a computing operating system and related components over the Internet.

**page layout** – the process of arranging text and graphics on a page.

**page view** – a request from a computer to load a page of a web site. They can be counted to analyze the number of people viewing a website.

**password** – a set of letters and/or numbers that allow someone to use or access something on a computer.

**patch** – a piece of code that is used to fix a flaw in a computer program.

**pay as you go** – a model for payment where customers pay according to how much they use a resource.

**PC (personal computer)** – refers to a computer that runs Windows® operating system.

**PCI compliance (payment card industry)** – is upholding certain security standards for accepting credit and other payment cards.

**PDA (personal data assistant)** – a palmtop computer that functions as a personal organizer but also provides e-mail and Internet access.

**PDA (Personal Digital Assistant)** – a small computer that is used to organize a person's schedules and information.

**performance tuning** – the act of adjusting a network or system so that it works as efficiently as possible.



**peripheral** – a device that can be connected to a computer.

**pharming** – a process wherein thieves reroute people to a fake website that appears to be legitimate in order to trick them into giving away their personal information.

**phishing** – a process wherein thieves trick people into giving away their personal information through e-mail.

**PHP** – a scripting language that is used to create dynamic web pages.

**piggyback** – means to gain unauthorized access to a computer system by taking advantage of the owner's legitimate connection.

**pixel** – one of the small dots that make up an image on a computer or television screen.

**pointer** – a small arrow that lets a user choose what to do on a computer.

**POP3** (Post Office Protocol) – a method that allows computer users to receive e-mail from a server.

**popup** – an advertisement that suddenly appears in a new window in an Internet browser.

**power supply** – delivers electricity to all parts of a computer.

**prepress** – the process of preparing a document, magazine or book to be printed on a large scale.

**pretexting** – a process wherein thieves trick people into giving away their personal information over the phone.

**printer** – a device that is used by a computer to transfer ink onto a paper.

**priority inversion** – a delay that occurs in a computer system when a low priority task is dealt with before a high-priority task.

**private cloud** – a service offered to specific users who have purchased it and is not available publicly.

**processing speed** – a measurement of how quickly a computer can perform tasks.

**processor** – carries out the instructions of computer programs.

**programmer** – someone who writes computer programs.

**protocol** – a set of rules that must be followed for the sake of security.

**public cloud** – a service offered for any users in the Internet.

**purge** – means to delete files or data from a computer.

**quality assurance** – the act of checking products for problems.

**quarantine** – means to place something or someone in complete isolation where they cannot access or infect anything or anybody else.

**query** – a search that locates all information of a specific type in a database.

**RAM** (Random Access Memory) – memory that can be quickly accessed.

**real time** – if information is updated or shown in real time, it is updated or shown at the same time as new information is received.

**redesign** – means to change website, add, or delete certain elements of it, but keep others.

**redundancy** – the inclusion of duplicate components in a system to maintain production when one component fails.

**reliability** – the probability that something will function properly and without any failures.

**replicate** – means to make copies of oneself.

**resident extension** – an add-on to a computer virus that causes it to become a part of the host computer's operating system.

**resident virus** – a computer virus that becomes a part of a file or disk drive but does nothing until activated by a trigger event.

**resize** – to make an image on a computer bigger or smaller.

**resolution** – the ability of a computer or camera to produce a clear and detailed image.

**resume** – a document that shows a person's education, work history and qualifications and is used when applying for a job.

**root directory** – the main directory of a file system and is where all other branches of the system come from.

**rootkit** – a type of a computer virus that is created to gain total control over a computer system by overwriting parts of its operating system.

**router** – a device that allows more than one computer to connect to a network at the same

**SaaS** (software as a service) – a service where users receive applications over the Internet instead of buying and installing them.

**Samba®** – is a Linux® program that allows Linux® to act as a client on a Windows®-based network.

**SATA** – an interface for connecting storage devices to a computer system.

**scalability** – a system's ability to change size as needed in a given situation.

**scan** – means to use a laser to read bar codes of a product and convert them to electronic signals.

**scanner** – 1) a device that is used for transferring printed documents and pictures into a computer system; 2) a device used to capture personal information stored on credit and debit cards, and passports.

**script** – a group of commands to be carried out automatically.

**search engine** – a computer program that allows users to search for particular information, products, etc. in the Internet.

**security** – a state of being safe from attack.

**security software** – software that keeps a computer safe from threats such as computer viruses and cybercrimes.

**serial robot** – a robot consisting of a single series of joints linked together.

**server** – a computer that connects many computers to hardware.

**shortcut** – an icon that has been moved to a desktop to make opening a file or program easier.

**SIMM** (Single Inline Memory Module) – an older type of memory module that sends up to 32 bits of data to a CPU.

**site key** – a security system that lets the bank and the account holder verify their identities to one another in online transactions.

**site license** – a permission that allows users to access software regardless of their location.

**Skype®** – software that enables people to call one another using computers rather than telephones.

**smartphone** – a cellular phone that also functions like a PDA.

**social networking** – the activity of socializing online with other people via networking sites, blogs, forums, etc.

**software** – a computer or instruction that makes a computer perform a specific task.

**sort** – to arrange information in a database in a specific way.

**spam** – unwanted e-mail, like advertisements, sent to large groups of people.

**spell check** – a function that checks a document for spelling errors.

**spreadsheet** – a computer program that performs calculation.

**spyware** – a type of a computer program that gathers someone's personal information without their knowledge.

**SSL connection** (Secure Sockets Layer) – a connection between two servers that encrypts information so that no one else can monitor or access the information exchanged.

**STMP** (Simple Mail Transfer Protocol) – a method that allows users to send e-mails to other users.

**sub-pixel rendering** – a process that increases the clarity of a text on certain displays.

**subscription** – the agreement to use something, often requiring a fee.

**sweep** – means to search a computer system for viruses.

**system administrator** – a person whose job is to manage and maintain a computer system.

**system requirements** – hardware or software needed to run a program.

**T-1** – a type of a line used by businesses that connects many users at once to the Internet.

**T-3** – a powerful line made of 28 T-1 lines.

**table** – a single collection or arrangement of information in a database.

**TCP/IP protocol** – a set of rules that determine how a computer connects to a network or the Internet.

**technical support** – task of helping people to use and understand technology.

**telecommunicate** – means to work at a location away from the main office by using technology.

**template** – blank layout for certain types of documents.

**terminal** – a computer that allows users to input command lines.

**text** – means to send someone a text message.

**text message** – a short, written message that a person sends to and from a cellphone.

**toggle** – means to move from one file or setting to another.

**touch screen** – a monitor that lets users interact with computer by touching the screen.

**touchscreen** – a display on some cell phones or i-pads that users tap to access its features and applications.

**tour** – a series of web pages that offer information about a product or site.

**traffic** – total number of users that go to and view a website in a certain amount of time.

**transparency adapter** – a device that is used with a scanner to capture see through documents like slides.

**Trojan horse** – a computer program that appears to be beneficial but is actually malicious.

**troubleshooting** – refers to the process of identifying and fixing technical problems.

**trust logo** – a seal that appears on a web page and means that the security of information on that page is assured by accredited company.

**typography** – a computer's use of typefaces.

**Ubuntu®** – an operating system based on Linux®.

**Unix®** – a specific type of computer operating system.

**UPC (universal product code)** – a 12-digit number used to identify consumer items.

**upgrade** – to improve something like a computer program or a type of service.

**upload** – means to transfer a file from a computer or device to the Internet or to another device such as an MP3 player.

**URL (Uniform Resource Locator)** – text and symbols that form a web address.

**usability** – easiness with which a person uses a website.

**USB (Universal Serial Bus)** – a commonly used type of connection or port to connect a peripheral to a computer.

**USB flash drive** – a portable flash memory system that uses a USB interface to connect to a computer and transfer information.

**user-friendly** – something that is easy to access and use.

**username** – a name or code that identifies a person on a computer and allows that person to access his files.

**utility computing** – a way of selling computer use as a metered service like water and electricity.

**vendor** – someone who distributes programs and utilities.

**video bridge** – a device that allows people to hold multipoint videoconferences, it connects calls from several different locations.

**video subsystem** – a part of a computer that presents visuals on the screen.

**videoconference** – a meeting or conversation between two or more people in different locations using computer technology.

**virtual memory** – a method of computer data storage when it stores data on its hard drive instead of in the RAM.

**virtual world** – an online reality where users can meet and interact with other people or computer players.

**virus** – a harmful computer program file that takes up residence in a computer without the owner's knowledge or permission.

**virus removal software** – destroys computer viruses, removing them from files they have infected.

**visibility** – easiness with which users find a website with the help of search engines, based on how many other websites link to it.

**visual basic** – a simple programming language with a graphical component.

**voice activation** – a feature of some cell phones that lets users dial a number by voice instead of by hand.

**voice-mail** – a feature that lets someone listen to or leave an electronic spoken message on a cell phone.

**VPN** (virtual private network) – a way to encrypt a connection when someone uses remote access.

**waypoints** – locations using wireless signals instead of a physical connection.

**web browser** – a computer program that allows people to look at web pages' in the Internet.

**web design** – act or practice of determining how to use a website looks.

**web developer** – someone who builds a website.

**web development** – act or practice of determining how to use a website works.

**web host** – a company that provides space for a web site in the Internet.

**web page analysis** – a process wherein the security of a website is determined in order to help computer users know whether or not the website is safe.

**web portal** – a webpage that displays information gathered from several different places.

**web site** – a collection of related pages in the Internet that contains information, pictures, etc. and is usually published by a person, group, or company.

**web-based** – something that is available in the Internet instead of on a CD.

**webcam** – a small camera that connects to a computer and broadcasts sound and video in the Internet.

**webmail** – an e-mail device that people access through a web browser and which sends and receives e-mail but does not store it on computers.

**Wi-Fi** (Wireless Fidelity) – a type of connection using wireless signals instead of a physical connection.

**window** – a rectangle on a desktop of a computer monitor that displays a file or program and which connects are independent of a desktop screen.

**Windows®** – an operating system created by Microsoft® and is used in many PCs.

**wireless Local Area Network (WLAN)** – a network that connects computers to a network without cables.

**wireless router** – a device that forwards data as a wireless signal.

**word processing program** – a program that helps to write on computers.

**worksheet** – a single page of a spreadsheet.

**workstation** – a very fast computer that runs powerful work programs.

**worm** – a type of malicious software that replicates itself through e-mails.

(World Wide Web) – system of web pages, information, pictures, etc. that is available. **XML** (extensive markup language) – a programming language that is used to encode web pages. **zip drive** – a removable disk storage system that is typically used to transfer data.