Министерство науки и высшего образования Российской Федерации

Томский государственный университет систем управления
и радиоэлектроники

ENGLISH FOR INFORMATION TECHNOLOGY

Учебное пособие

для студентов технических вузов

Томск
ТУСУР
2023

Рецензент:

Надеждина Елена Юрьевна,

кандидат педагогических наук, доцент кафедры иностранных языков ФГБОУ ВО «Томский государственный университет систем управления и радиоэлектроники»

Составители: О. И. Тараканова, О. Ю. Зиско, Е. М. Покровская.
English for Information Technology: учебное пособие для студентов технических направлений подготовки / составители О. И. Тараканова, О. Ю. Зиско, Е. М. Покровская - Томск : Томск. гос. ун-т систем упр. и радиоэлектроники, 2023. - 82 с.

Настоящее учебное пособие составлено в соответствии с требованиями ФГОС ВО 3++ направлений подготовки и специальностей технического университета и содержанием программы по иностранному языку для технических вузов.

Пособие   содержит   научно-популярные   и   профессионально-ориентированные   тексты   с упражнениями для обучения иностранному языку студентов технических направлений подготовки.

Протокол № 1 заседания каф. ИЯ от 10.01.2023 г.

Contents

Введение

Настоящее учебное пособие составлено на основе требований ФГОС ВО 3++ для студентов направлений подготовки и специальностей бакалавриата. Основная цель — формирование у студентов профессиональных компетенций, необходимых для профессионального взаимодействия.

При разработке учебного материала авторы учитывали необходимость повторения и активизации основных грамматических и лексических явлений, изученных в обще-образовательных учреждениях, а также необходимость углублённого изучения лингвистических понятий и представлений для межличностного общения и будущей профессиональной деятельности.

Тематика текстов определяется уровнем общетехнических знаний, которыми обладают студенты первого курса следующих факультетов технического университета: вычислительных систем, систем управления и электронной техники.

Пособие состоит из двух разделов:

Reading Course (RC) — адаптированные научно-популярные тексты с коммуникативными упражнениями.

Grammar Reference с упражнениями.

Данное пособие является дополнением к уже имеющимся пособиям «English for Engineering Faculties» , "Software Engineering".

Reading Course (RC) состоит из следующих разделов:

Unit 1. A software engineer
Unit 2. Types of computer
Unit 3. System software
Unit 4. Application software
Unit 5. Programming software
Unit 6. Information security
Unit 7. Artificial intelligence
Unit 8. Cloud computing

Grammar Reference включает в себя следующие темы:

1. Degrees of comparison
2. Present Simple/Present Continuous
3. Present Perfect/Past Simple
4. Passive voice
5. Conditionals
6. The infinitive
7. Gerund
8. Participle

Материал рекомендуется изучать параллельно с темами имеющихся пособий для более углублённого понимания материала и закрепления лексических и грамматических конструкций.

О. И. Тараканова, О. Ю. Зиско, Е. М. Покровская

Reading Course

Unit 1. A SOFTWARE ENGINEER

Text A

What is a Software Engineer?

1.1 Memorize the following words and phrases.

to be good at	преуспевать в чем либо
due to	благодаря чему-то, из-за чего-то
in order to	для того, чтобы
such as	такой как
to meet one's needs	удовлетворять чьим-либо требованиям
to be suited for	подходить для чего-то
make sure	удостовериться
tight deadlines	жёсткие сроки
venture capital-backed start-ups	стартапы, поддерживаемые венчурным капиталом

1.2 Read the text.

Software engineering is a branch of computer science which includes the development and building of computer systems software and applications software. Computer systems software is composed of programs that include computing utilities and operations systems. Applications software consists of user-focused programs that include web browsers, database programs, etc.

There is a lot of investment going into software engineering at the moment due to the increasing reliance on mobile technology, venture capital-backed start-ups, the growing complexity of technology, and emerging industries. The demand for skilled and qualified software engineers seems to have no end. This demand is strengthened by a changing economic landscape and fueled by the need for technology solutions. With billions of physical devices around the world that are now connected to the internet and that are collecting and sharing data, all industries are quickly becoming technology driven industries.

Software engineers have extensive knowledge of programming languages, software development, and computer operating systems, and they apply engineering principles to software creation. By applying these engineering principles to every stage of the development process, from requirements analysis to the software process, they can create customized systems for individual clients. Just as a civil engineer will make sure that a bridge has a solid foundation, a software engineer will also begin with a thorough study of requirements and work through the development process in a systematic way.

What does a Software Engineer do?

Software engineers are highly sought after. Developers that live in high demand areas often receive many inquiries a month from recruiters and head hunters. A software engineer applies mathematical analysis and the principles of computer science in order to design and develop computer software.

There are many types of software that a software engineer can develop, such as operating systems, computer games, middleware, business applications and network control systems. Changes in technology and new areas of specialization keep this profession evolving at a rapid pace.

When working with a client, a software engineer will typically analyse the client's needs, then design, test, and develop the computer software in order to meet those needs. They are experts in computing systems, software structure, and recognizing the limitations of the existing hardware. The process is complicated and intricate, therefore the use of diagrams, flowcharts, and the creation of algorithms to tell the computer what to do are created. Converting these instructions into a computer language (coding/programming) is usually the responsibility of a computer programmer.

Software engineers must also possess interpersonal skills, and be able to effectively communicate with users in order to train, test, and debug software all the way to the end product. They are often involved from the early stages of software planning right through to the testing, development, training, and support stages.

Software engineers can be divided into two categories:

Applications Engineers

Applications engineers create or adapt applications for businesses and organizations by analysing the end user's needs. They will design, build, install, and maintain these applications or programs.

Systems Engineers

Systems engineers coordinate the creation, maintenance and growth of a business or organization's computer systems. They coordinate each department's needs, suggest technical direction, and set up any networks that link up computers with the company.

Being a software engineer is a great career choice for someone who is exceptionally good at both left and right-brained thinking (analytical skills as well as problem-solving skills). Software engineers are instinctive problem-solvers, good at working with others and focused on seeing issues through to their successful completion.

Are you suited to be a software engineer?

Software engineers have distinct personalities. They tend to be investigative individuals, which means they're intellectual, curious, methodical, rational, analytical, and logical. Some of them are also conventional, meaning they're conscientious and conservative.

With such unprecedented growth in a multitude of industries, software engineers can pursue careers in any number of areas, including technology, healthcare, automotive manufacturing, green energy, remote sensing, aeronautics, government, non-profit, and finance.

Software engineers can work as either employees or as contractors. They typically work in comfortable settings, but it is sometimes a stressful job that involves long hours and tight deadlines.

1.3 Answer the questions.

1. What is computer systems software composed of?
2. What does application software include?
3. Are skilled and qualified software engineers demanded at the moment?
4. What knowledge should a software engineer have?
5. What does a software engineer begin to create a customized system from?
6. What categories can software engineers be divided into?
7. What personal features do they have?
8. Where can software engineers work?

1.4 Translate the following attribute groups.

Development process, application software, computer systems software, technology solutions, network control system, end product, end user's needs, requirements analysis, network control systems.

1.5 Match the words with the same meaning.

1. rapid	a) develop
2. solve	b) correct
3.right	c) usually
4. require	d) connect
5. every	e) many
6 design	f) decide
7. link up	g) fast

8 typically   h) grow

9 multiple   I) demand

10 increase   j) each

1.6 Match the opposites.

1.bug   a) send

2 code   b) exclude

3 right   c) hardware

4 long   d) disorder

5 order   e) unusual

6 complicated   f) debug

7. receive   g) left

8. include   h) short

9. software   I) decode

10. conventional   j) easy

Text B

IT specializations

1.7 Read the text.

There are a lot of specializations in IT. When choosing a direction follow your interests, since each specialization has its own characteristics. For example, if you like applied design, then robotics is suitable for studying, but if you fancy computational problems, then fundamental informatics is your choice. Popular areas in universities are **Computer Science** and **Software Engineering.** Computer science is a general and diverse field of study that has various branches (artificial intelligence, computer systems and networks, security). Also, such specialization as **Data Science** is gaining momentum. It implies work with statistics and mathematics. Among the promising areas for the future are computer security and artificial intelligence.

Cyber security. With the introduction of technology in all spheres of human life: from buying groceries to managing the state, more and more hackers and cyber terrorists appear. They harm both individuals and government agencies and large companies. Therefore, in the modern world, data protection is not a luxury, but a vital necessity. To defend against cyberattacks and security breaches, leading organizations

are willing to pay big sums to cyber analysts. The U.S. Bureau of Labor Statistics predicts that cybersecurity jobs will grow 28% from 2016 to 2026 – much faster when compared to the average growth of the other professions.

Artificial Intelligence (AI) is one of the most controversial and intriguing areas in computer science. AI is still in its early stages of development, but tech giants like Facebook, Google, and IBM are already investing huge amounts of money and resources into AI research. The global robotics industry is expected to be worth 80 billion USD by 2024. The field of study is promising and could completely change the world. However, artificial intelligence has both benefits and potential risks. Apart from the doomsday scenario, AI, for example, can optimize tasks and reduce human error, but at the same time lead to the automatization of labor, and therefore to the disappearance of jobs.

How to become a programmer?

You don't necessarily need an education to become a programmer, especially when you consider the fact that the IT sphere is developing at the speed of light and traditional universities and colleges struggle to keep up with the innovations of science. However, experienced specialists still insist on obtaining higher or at least secondary vocational education. It will take much more time and effort to master the IT field on your own than in a university that already has a developed curriculum, a training system, incentives in the form of grades and mentors who know their subject. If, after all, your choice is a self-study, then you need to be patient and persistent. It is important to read professional literature, attend courses, and practice a lot. However, one should not hope for high engineering and research positions — they require higher education. After school or college, it is quite possible to start from the position of a simple developer, keep learning, and subsequently become a good specialist.

Qualifications
Microsoft Certified Systems Engineer (MCSE).
MCSE designs, install, support and troubleshoot information systems. MCSEs are network gurus, support technicians and operating system experts.
Microsoft Certified Solution Developer (MCSD).
MCSDs use development s tools and platforms to create business solutions.
Microsoft Certified Product Specialist (MCPS).
MCPSes know all about at least one Microsoft operating systems. Some also specialize in other Microsoft products, development tools or desktop applications.
Microsoft Certified Trainer (MCT).
MCTs teach others about Microsoft products using Microsoft Official Curriculum at Microsoft Authorised Technical Education Centres.

1.8 Answer the questions.

1. What are the main branches of computer science?
2. What does Data Science imply?
3. What are the most promising fields of computer science?
4. Why is it necessary to defend from cyberattacks?
5. Can AI facilitate human labour?
6. Is the disappearance of jobs the main disadvantage of AI development?
7. Is it possible to get a higher position in an IT company if you don't have a special education in computing?

1.9 Match the words with the opposite meaning.
1. benefit   a) higher education
2. vocational education b) to enlarge
3. completely   c) to lag behind
4. to keep up   d) partially
5. to reduce   e) risk

Unit 2. TYPES OF COMPUTERS

Text A

Types of computers 1

2.1 Memorize the following words and phrases.

to measure	измерять
to process	обрабатывать
to convert	переводить, преобразовывать
to intend	намереваться, предназначаться
to store	хранить, сохранять
to control	управлять
to supply	обеспечивать, снабжать, давать
compared to	по сравнению с
in addition to	кроме

2.2 Read the text.

Everything we hear and see is changing continuously. This variable continuous stream of data is known as analogue data. **Analog computer** may be used in scientific and industrial applications such as to measure the electric current, frequency and resistance of the capacitor, etc.

Analogue computers directly accept the data in the measuring device without first converting it into codes and numbers.

Digital Computer

The digital computer is the most widely used to process data with numbers using digits, usually utilizing the binary number system.

A digital computer is intended to do calculations and logical operations at a high rate. It works on data, such as magnitudes, letters and symbols, expressed in binary code – with just two digits 1 and 0. By counting, comparing and manipulating those digits or their mixtures by a pair of instructions stored in memory, a digital computer may perform such tasks to control industrial processes and control the operation of the machinery; examine and organize vast amounts of company data, and mimic the behavior of dynamic systems (e.g. international climate patterns and chemical reactions) in scientific study. Digital computer supplies accurate result but they are slow compared to an analogue computer.

Hybrid Computer

A hybrid computer combines the aspects of a digital computer and an analogue calculations. In large businesses and companies a hybrid computer may be employed to integrate logical operations in addition to provide efficient processing of different equations. For instance, a gas pump includes a chip that converts the dimensions of fuel flow to volume and cost. A hybrid computer is used in hospitals to gauge the heartbeat of the individual.

2.3 Match the words with the same meaning.

1. to supply	a) flow
2. to use	b) speed
3. accurate	c) to employ
4. to compute	d) amount
5. rate	e) exact
6. number	f) information
7. stream	g) work
8. data	h) receive
9. operation	i) to calculate
10. to accept	j) to provide

Text B

Types of Computers 2

2.4 Read the text.

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

Following is a classification of the different types of computers based on their sizes and processing powers. Computers are categorized as mainframe and microcomputers.

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

Microcomputers: A computer with a microprocessor and its central processing unit is known as a microcomputer. They do not occupy space as much as mainframes do. When supplemented with a keyboard and a mouse, microcomputers can be called personal computers (PC). A monitor, a keyboard and other similar input-output devices, computer memory and a power supply unit come packaged in a microcomputer. These computers can fit on desks or tables and prove to be the best choice for single-user tasks.

Personal computers come in different forms such as desktops, laptops and personal digital assistants. Let us look at each of these types of computers.

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

Laptops: Similar in operation to desktops, laptop computers are miniaturized and optimized for mobile use. Laptops run on a single battery or an external adapter that charges the computer batteries. They are enabled with an inbuilt keyboard, touch pad acting as a mouse and a liquid crystal display. Their portability and capacity to operate on battery power have proven to be of great help to mobile users.

Netbooks: They fall in the category of laptops, but are inexpensive and relatively smaller in size. They had a smaller feature set and lesser capacities in comparison to regular laptops, at the time they came into the market. But with passing time, netbooks too began featuring almost everything that notebooks had. By the end of 2008, netbooks had begun to overtake notebooks in terms of market share and sales.

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

Tablet Computers: Tablets are mobile computers that are very handy to use. They use the touch screen technology. Tablets come with an onscreen keyboard or use a stylus or a digital pen. Apple's iPad redefined the class of tablet computers.

These were some of the different types of computers used today. Looking at the rate of advancement in technology, we can definitely look forward to many more in the near future.

2.5 Decide whether these sentences are true or false according to the text.

1. A mainframe computer is less powerful than a PC.
2. A mainframe is used by large organizations and needed to process enormous amounts of data.
3. The most suitable computers for home use are desktop PCs.
4. A laptop is not portable.
5. Laptops are not as powerful as desktop PCs.
6. Using a stylus, you can write directly onto the screen of a tablet PC.
7. Netbooks are bigger in size and weight than laptops.
8. A personal Digital Assistant (PDA) is small enough to fit into the palm of your hand.
9. A PDA does not allow you to surf the Web.

2.6 Translate the following attribute groups.

Computer memory capacities, bulk data processing, computer memory, power supply unit, power consumption, liquid crystal display, feature set, touch screen, memory card, battery power, market share

2.7 Match the words with the same meaning.

1. occupy	a) precision
2. rate	b) perform
3. accuracy	c) big
4. huge	d) speed
5. store	e) characteristic
6. capacity	f) save
7. feature	g) opportunity
8. require	h) take place
9. build-in	i) demand
10. carry out	j) embedded

2.8 Match the words with the opposite meaning.

1. memorize	a) output
2. speed up	b) enlarge
3. huge	c) the same
4. liquid	d) analog

5. external   e) solid

6. input   f) powerless

7. digital   g) slow down

8. shrink   h) internal

9. different   i) forget

10. powerful   j) tiny

2.9 Insert appropriate words from the box into gaps.

touch screen	depending on	speed up	access	fit
consumed	capacities	mobile	inventions	features

1. Computers help us … daily work.
2. Early computers … huge amounts of electric energy.
3. Computers are classified … the processing power and size.
4. Mainframe computers have … to operate as a number of virtual machines.
5. A microcomputer can … on a desk or table.
6. Laptops are of great help to … users.
7. Netbooks now have the same … as notebooks.
8. PDAs can … the Internet by means of Bluetooth or WiFi.
9. Tablets use … technology.
10. A computer is one of the greatest … of mankind.

2.10 Put the verb in brackets into appropriate form.

1. User-focused programs … Web browsers, database programs, etc. **(to include)**
2. Billions of physical devices around the world … to the Internet. **(to connect)**
3. All industries … technology driven industries. **(to become)**
4. Computer system software … of utilities and operating systems. **(to compose)**
5. Algorithms to tell the computer what to do … **(to create)**
6. Software engineers must … to communicate with the users. **(to be able)**
7. PDAs can …. as portable audio players and smartphones. **(to use)**
8. A computer with a microprocessor … as microcomputer. **(to know)**

2.11 Read the text.

Wearable

The latest trend in computing is wearable computers. Essentially, common computer applications (e-mail, database, multimedia, calender/scheduler) are integrated into watches, cell phones, visor and even clothing. Many other wearables target outdoors enthusiasts and fitness freaks, allowing them to track their location, altitude, calories burned, steps, speed and much more.

The **Apple Watch** now in its fourth incarnation, is one of the best reviewed wearables to date. This small watch has many of the functionalities of a full-brown smartphone. It lets you perform normal texting and e-mail duties. And it has a built-in cell phone, unlike some other small watches that must be paired with a phone to make calls. It even has a built-in electric heart sensor that you can use to take an electrocardiogram and share it instantly with your doctor.

2.12 Find the words in the text that mean.

1. to follow a person or an animal by looking for proof that they have been there or by using electronic equipment
2. a place or position
3. different from
4. permanently connected and cannot be easily removed
5. to have or use smth. at the same time as someone else

Unit 3. SYSTEM SOFTWARE

Text A

System Software

3.1 Memorize the following words and phrases.

data flow	поток данных
attach	подсоединять
particular	конкретный, особый
word processor	текстовый редактор
time critical environment	критическая по времени среда
share	делиться, совместно использовать
imply	подразумевать
serially	последовательно
batch	пакет
time-sharing system	система распределения времени
in the background	на заднем плане, в фоновом режиме
support	поддерживать, обеспечивать

3.2 Read the text.

System software is a type of computer program that is designed to run a computer's hardware and application programs. If we think of the computer system as a layered model, the system software is the interface between the hardware and user applications. The **operating system** (OS) is the best known example of system software. The OS manages all the other programs in a computer.

Other examples of system software include:

The **BIOS** (basic input/output system) gets the computer system started after you turn it on and manages the data flow between the operating system and attached devices such as the hard disk, video adapter, keyboard, mouse and printer.

The **boot program** loads the operating system into the computer's main memory or random access memory (RAM).

An **assembler** takes basic computer instructions and converts them into a pattern of bits that the computer's processor can use to perform its basic operations.

A device driver controls a particular type of device that is attached to your computer, such as a keyboard or a mouse. The driver program converts the more general input/output instructions of the operating system to messages that the device type can understand.

Additionally, system software can also include system **utilities**, such as the **disk defragmenter** and **System Restore**, and development tools, such as **compilers** and **debuggers.**

System software and application programs are the two main types of computer software. Unlike system software, an application program (often just called an application or app) performs a particular function for the user. Examples include browsers, email clients, word processors and spreadsheets.

3.3 Match the words with their definitions.

1. utility	a) application program with an array of cells that is used for calculating formulas
2. interface	b) a program that converts instructions into bits
3. assembler	c) program included with an operating system that can perform useful common routine tasks
4. a device driver	d) hardware or software that connects systems and allow them to communicate with each other
5.spreadsheet	e) systems program that controls a peripheral device

3.4 Read and decide whether the statements are True or False.

1. System software is a type of computer program that is designed to run only applications.
2. The OS manages all the programs in a computer.
3. The boot program uploads the operating system into the net.
4. A device driver controls all peripheral devices.
5. Debugger is a program that finds and corrects errors in code.

3.5 Fill in an appropriate word in each sentence from the box.

debugging	response	batch	embedded	simultaneously

1. A Multi-user OS … allows many different users to use computer resources.
2. Data and programs are bundle and processed serially in … systems.
3. Interactive systems were introduced for fast turnaround when … the programs.
4. Single-tasking OS is known as … operating system.

5. With Hybrid OS it is possible to get fast …

Text B

Operating System

3.6 Read the text.

An operating system (OS) is software, consisting of programs and data, which manages computer hardware resources, and provides basic interface for execution of various application software. The operating system is the most important type of system software in a computer system. In simple language it's software that manages all of the hardware and all of the software. Various managers of operating system are used to manage computer resources.

Operating Systems are basically designed with three goals:

1. To efficiently manage resources of computer system like input/output device, memory, processor, process files etc.

2. To provide convenient environment to user so that they can interact with resources available within the computer system easily.

3. To provide secure environment to users so that they can share resources and interact with other users of the system or on the network.

There are generally seven types of OS, categorized based on the types of computers they control, response time, the sort of applications they support and how data is entered into the system. The categories are:

Real Time Operating Systems (RTOS)

Real time operating systems are fastest OS which are used in time-critical environments where data must be processed very quickly because the output influences immediate decisions. RTOS are used to control machinery, scientific instruments, industrial systems, sophisticated medical equipment, airport traffic, space flights and high speed aircraft. In general the users do not have much control over the functions performed by the RTOS.

Single User – Single Tasking OS

As the name implies, this operating system is designed to manage the computer so that one user can effectively do one thing at a time. This OS are also known as embedded operating systems. This type of OS is used in personal digital assistants (PDAs) and advanced mobile phones.

Multi-Tasking OS

This OS allows a single user to simultaneously run multiple applications on their computer. This is the type of operating system found on most personal desktop and laptop computers. The Windows (Microsoft) and Macintosh (Apple) platforms are the most popular single-user, multi-tasking OS.

Multi-User OS.

A multi-user operating system simultaneously allows many different users to take advantage of the computer's resources. Unix, MVS, VMS are examples of a multi-user operating system.

Batch Processing OS

Batch systems date from the earliest computers, which relied on tape or punched cards for input. Data and programs that need to be processed were bundled and collected as a batch and executed together. Today batch systems aren't limited to cards or tapes, but the jobs are still processed serially, without user interaction.

Interactive OS

Interactive systems also called time-sharing systems give a faster turn-around than batch systems but are slower than the RTOS. They were introduced to satisfy the demands of users who needed fast turnaround when debugging their programs.

Hybrid OS

This type of systems is a combination of both interactive and batch systems. They appear to be interactive because individual users can access the system via terminals and get fast response, but such system actually accepts and run batch programs in the background when the interactive load is light. Many large computer systems are hybrid.

3.7 Answer the following questions.

1. What is an OS?
2. What are the purposes of operating systems that they are designed for?
3. How many types of OS are there?
4. What are they based on?
5. What type of OS is used to control space flights?
6. What type of OS does Unix system belong to?

3.8 Match the words with the same meaning.

1. to input	a) to manage
2. to control	b) to satisfy the demands
3. sophisticated	c) simultaneously
4. to take advantage	d) to enter
5. at the same time	e) to use
6. to meet the needs	f) complex

3.9 Translate the following word groups.

Development tools, computer hardware resources, secure environment, response time, time-critical environment, airport traffic, space flights, batch system, user interaction, time-sharing system.

3.10 Translate the following sentences from Russian into English.

1. Обычные компьютерные приложения, также как электронная почта, календарь и т.д. встроены в сотовые телефоны, часы и даже одежду.
2. Эти маленькие часы даже имеют встроенный сердечный датчик, который вы можете использовать для того, чтобы снять электрокардиограмму и послать её доктору мгновенно.
3. Искусственный интеллект (ИИ) может стать существенным риском для человечества, если его способности не будут направлены на полезные цели.
4. Операционная система управляет компьютерными ресурсами и обеспечивает интерфейс для выполнения различных прикладных программ.
5. ИИ использует те же алгоритмические функции, что и традиционное программное обеспечение, но применяет их по-другому.
6. Одной из целей ОС является обеспечение удобной среды для пользователя, чтобы он легко мог взаимодействовать с доступными ресурсами.
7. Каждое поколение хакеров внесло свой вклад в компьютерные технологии.
8. Говоря о модели настольного компьютера, термин «компьютер», обычно, относится только к самому компьютеру, а не к монитору, клавиатуре или мышке.
9. RAM – это быстрый тип компьютерной памяти, который временно хранит всю информацию на вашем компьютере.
10. Все современные компьютеры, такие как ноутбуки или настольные компьютеры, которые мы используем в офисе или дома, являются цифровыми.

Unit 4. APPLICATION SOFTWARE

Text A

Application Software

4.1 Memorize the following words and phrases.

accomplish	выполнять, осуществлять
handling	обработка, управление
editing	редактирование
on the other hand	с другой стороны
general purpose software	ПО общего назначения

4.2 Read the text.

Application Software is the type of software that is designed to accomplish specific tasks within the operating system. Some of these tasks include handling documents, handling calculations, image editing and video editing among others.

Difference between System Software and Application Software
Software is basically classified into two categories, System Software and Application Software, where System Software acts as an interface between Application Software and hardware of the computer. The Application Software acts as an interface between user and Systems Software.

The System Software is designed to manage the system resources and it also provides a platform for Application Software to run. On the other hand, Application Software is designed for the users to perform their specific tasks.

Key Difference between System Software and Application Software.

1. System Software is designed to manage the system resources like memory management, process management, protection and security, etc. And it also provides the platform for the application software to run. On the other hand, the Application Software is designed to meet the user requirements of performing specific tasks.
2. The System Software is written in a low language like assembler language. However, Application Software is written in a high level language like Java, C++, .net, VB, etc.
3. The System Software starts running as the system is powered on and run till the system is powered off. The Application Software starts when the user starts it and stops when the user stops it.

4. A system cannot run without the System Software whereas the Application Software is user specific. They are not required to run a system, they are meant only for the users.

5. Where the System Software is general-purpose software, the Application Software is specific purpose software.

6. The best example of System Software is Operating System whereas, the example of Application Software is Microsoft Office, Photoshop, etc.

4.3 Fill in the comparison chart.

Basic for comparison	System Software	Application Software
Basic		
Language		
Run		
Requirements		
Purpose		
Examples		

4.4 Match the words with the same meaning.

1. perform	a) objective
2. design	b) develop
3. require	c) compute
4. calculate	d) accomplish
5. include	e) imply
6. use	f) demand
7. error	g) take advantage
8. accept	h) obtain
9. mean	i) bug
10. purpose	j) comprise

4.5 Translate the following word combinations:

1. memory management
2. process management
3. video editing
4. image editing

5. user requirements
6. satellite navigation program
7. data security
8. route planning applications
9. cost analysis
10. software engineering project

4.6 Fill in the gaps appropriate word from the box.

compatible	simulation	payroll	assembler	particular

1. A realistic representation of something is called …
2. System software is written in a low level language like …
3. Application software is user specific and meant only for … users.
4. This satellite navigation program needs to be … with digital assistants.
5. Managers in companies use programs to organize …

4.7 Translate the sentences from Russian into English.

1. Я бы на твоём месте заменил вентилятор.
2. Я лучше проконсультируюсь у инженера-электронщика.
3. Ты уже устранил эту проблему?
4. Корпус компьютера нагревается больше чем обычно.
5. Нужен более мощный вентилятор, чтобы корпус не перегревался.
6. Источник питания издаёт какой-то (шипящий) шум.
7. Я думаю, проблема в том, что компьютер стоит очень близко к окну.
8. Я бы на твоём месте установил водонепроницаемый кожух, чтобы он не отсыревал.
9. Новый процессор намного быстрее, чем старый.
10. Этот вентилятор слишком шумный. Его нужно заменить.

Unit 5. PROGRAMMING SOFTWARE

Text A

Programming tools

5.1 Memorize the following words and phrases.

on the other hand	с другой стороны
nonetheless	тем не менее, однако
on the fly	на ходу, на лету
tight-knit	тесно связанный
authoring	авторская разработка
compiling	составление, компиляция
deploying	развёртывание, использование
debugging	отладка, доводка
time-consuming	длительный
error-prone	подверженный ошибкам
comprehensive facilities	комплексные услуги
productivity	производительность

5.2 Read the text.

A programming tool or software development tool is a computer program that software developers use to create, debug, maintain or support other programs and applications. The term usually refers to relatively simple programs that can be combined to accomplish a task. The most basic tools are a source code editor and a compiler or interpreter, which are used ubiquitously and continuously. Other tools are used more or less depending on the language, development methodology, and individual engineer. Tools may be discrete programs, executed separately- often from the command line – or may be parts of a single large program, called an integrated development environment (IDE).

An integrated development environment is a software application that provides comprehensive facilities to computer programmers for software development. An IDE normally consists of at least a source code editor, build automation tools and a debugger.

Integrated development environments are designed to maximize programmer productivity be providing tight-knit components with similar user interfaces. They

present a single program in which all development is done. This program typically provides many features for authoring, modifying, compiling, deploying and debugging software. One aim of the IDE is to reduce the configuration necessary to piece together multiple development utilities.

Modern computers are very complex and in order to program them various abstractions are needed. Programming tools like assemblers, compilers and linkers translate a program from a human writeable and readable source code language into bits and bytes that can be executed by a computer. Interpreters interpret the program on the fly to produce the desired behaviour.

These programs perform many well defined and repetitive tasks that would nonetheless be time-consuming and error-prone when performed by a human. Optimizing compilers on the other hand can perform complex transformations on the source code in order to improve the execution speed or other characteristics of a program. This allows a programmer to focus more on higher level, conceptual aspects of a program without worrying about the details of the machine it is running on.

5.3 Translate the following word groups.

1. software development tools
2. tight-knit components
3. source code editor
4. development methodology
5. execution speed
6. command line
7. developer productivity
8. integrated development environment
9. build automation tools
10. software debugging

5.4 Answer the following questions.

1. What does the term "programming tool" refer to?
2. What are the most basic tools?
3. What is an IDE?
4. What does it consist of?
5. What is IDE designed for?
6. What features does it provide?
7. What programs help to translate from human language into bits and bytes?
8. What does a programming tool allow a programmer to focus on?

5.5 Match the words with the same meaning.

1. perform	a) identify
2. nonetheless	b) velocity
3. allow	c) execute
4. modify	d) want
5. deploy	e) use
6. complex	f) change
7. aim	g) permit
8. define	h) difficult
9. speed	i) purpose
10. desire	j) however

5.6 Match the words with the definitions.

1. source code editor	a) a basic program for entering commands and code into a computer
2. debugger	b) provides links to additional information needed for programs to run
3. compiler	c) a computer language used for writing computer programs
4. linker	d) finds and corrects mistakes in code
5. interpreter	e) software used to enter lines of coded text
6. programming language	f) application that decodes instructions written in other languages
7. text editor	g) reads and executes other programs

Text B

GUI

5.7 Memorize the following words and phrases.

convey	передавать
visibility	видимость, наглядность, прозрачность
enhance	усиливать, укреплять, активизировать, повышать, обогащать
transparency	прозрачность
drop shadows	тень, полумрак, затенение
keyboard shortcuts	сочетание клавиш, клавиши быстрого доступа

5.8 Read the text.

A GUI (graphical user interface) is a system of interactive visual components for computer software. A GUI displays objects that convey information, and represent actions that can be taken by the user. The objects change color, size, or visibility when the user interacts with them. GUI objects include icons, cursors, and buttons. These graphical elements are sometimes enhanced with sounds, or visual effects like transparency and drop shadows. A GUI is considered to be more user-friendly than a text-based command-line interface, such as MSDOS, or the shell of Unix-like operating systems. The GUI was first developed at Xerox PARC by Alan Kay, Douglas Engelbart, and a group of other researchers in 1981. Later, Apple introduced the Lisa computer with a GUI on January 19, 1983.

What is a GUI (Graphical User Interface)?

How do you pronounce GUI? GUI is pronounced by saying each letter (G-U-I). It sometimes is also pronounced as "gooey." How does a GUI work? A GUI uses windows, icons, and menus to carry out commands, such as opening, deleting, and moving files. Although a GUI operating system is primarily navigated using a mouse, a keyboard can also be used via keyboard shortcuts or the arrow keys. As an example, if you wanted to open a program on a GUI system, you would move the mouse pointer to the program's icon and double-click it.

What are the benefits of GUI? Unlike a command-line operating system or CUI, like Unix or MS-DOS, GUI operating systems are easier to learn and use because commands do not need to be memorized. Additionally, users do not need to know any programming languages. Because of their ease of use and more modern appearance, GUI operating systems have come to dominate today's market. What are examples of a GUI operating system? Microsoft Windows Apple System 7 and MacOS Chrome OS Linux variants

like Ubuntu using a GUI interface.

Are all operating systems GUI? No. Early command line operating systems like MS-DOS and even some versions of Linux today have no GUI interface. What are examples of a GUI interface? 1. GNOME. 2. KDE. 3. Any Microsoft program, including Word, Excel, and Outlook. 4. Internet browsers, such as Internet Explorer, Chrome, and Firefox.

How does the user interact with a GUI? A pointing device, such as the mouse, is used to interact with nearly all aspects of the GUI. More modern (and mobile) devices also utilize a touch screen. However, as stated in previous sections, it is also possible to navigate a GUI using a keyboard. Does a GUI require a mouse? No. Nearly all GUI interfaces, including Microsoft Windows, have options for navigating the interface with a keyboard only.

5.9 Match the verbs with the nouns.

1. recharge   a) digital photos
2. click on   b) faxes
3. dial   c) a number on your mobile phone
4. give   d) presentation
5. move   e) smth. with a mouse
6. print out   f) the battery
7. send and receive   g) the mouse
8. take some   h) twenty pages

5.10 Choose the best verb.

1. To turn on the computer … the "Start" button.
    a) press   b) touch   c) switch
2. The printer …of ink.
    a) finished   b) ended   c) ran out
3. Unfortunately, the scanner isn't … at the moment.
    a) working   b) going   c) doing
4. The batteries in my digital camera are nearly dead. They need …
    a) changing   b) exchanging   c) to change
5. I have to ... a computer screen for eight hours a day.
    a) see   b) watch   c) look at
6. Switch off your computer and … it from the wall socket.
    a) non- plug   b) de-plug   c) unplug
7. ... any key to continue.
    a) Kick   b) Smash   c) Hit

5.11 Choose the best adjective.

1. Oh, dear. I pressed the … button.
    a) incorrect   b) wrong   c) false
2. I can't use my mobile phone. The battery is …
    a) flat   b) over   c) exhausted
3. The battery isn't completely flat, but it's …
    a) low   b) short   c) down
4. My video camera is …
    a) quick   b) uncomplicated   c) obvious
5. My new computer has a very … processor.
    a) quick   b) high speed   c) fast
6. Keeping files on paper is … solution.
    a) an old-tech   b) a past-tech   c) a low tech
7. My new PDA is the … model.
    a) latest   b) newest   c) most modern
8. A call from New York to Tokyo is … distance.
    a) far   b) long   c) faraway
9. I don't think this printer is … with my computer.
    a) connectable   b) compatible   c) suitable
10. My laptop is only three centimeters …
    a) tall   b) wide   c) thick
11. The screen on my laptop isn't very …
    a) light   b) white   c) bright
12. In three or four years my computer will probably be …
    a) old-fashioned   b) behind the times   c) obsolete

Unit 6. INFORMATION SECURITY

Text A

Computer Security and Computer Crime

6.1 Read the text.

Computer crime, or cybercrime as it is often known, is the fastest-growing type of criminal activity in the world today. The more advanced computers are manufactured, the more sophisticated the cyber criminals become. Computer crime covers a large range of illegal activity, including bank and credit card fraud, computer hacking, industrial espionage, organized pedophilia, and terrorism. What is more, computer crime has no national boundaries. Investigators face many technical and legal barriers when it comes to trying to identify perpetrators of cybercrimes. Yet there has been some success, and computer forensics is becoming an increasingly important part of forensic science.

Much undesirable, if not actually illegal, computer activity happens in the workplace. A recent survey carried out by the Federal Bureau of Investigation showed that most organizations have found security breaches of their computer networks. The most serious outcome was theft of confidential information, costing millions of dollars to companies as a whole. Almost all companies had had viruses infecting their computers with loss or potential loss of valuable data. Another major form of unwanted computer activity consisted of defacement of the company's website. There was also widespread reporting of abuse of computer privileges by employees by downloading pornography or pirated software.

Hacking is the most common form of computer crime. It is defined as willful penetration of a computer system for malicious purposes. All computer users are vulnerable to hacking, regardless of how secure they assume they are through anti-virus software, firewalls, and password protection. It happened to software giant Microsoft after all, so it could potentially happen to anyone. Sending a virus, a small program that acts on the victim's computer, is one of the main ways in which hackers operate. There are many types of viruses. They do not all destroy data; some viruses are designed to send valuable data back to the hacker. Trojan horse viruses, for example, consist of hidden instructions in e-mails or software which, when opened, will damage, modify, or send important data. Another is the aptly named logic "bomb" that only takes effect a while after it has been sent, allowing the perpetrator ample time to clear away the evidence.

Once a hacker has access to a computer, he or she has access to much of the information inside it, such as bank details, credit card numbers, and passwords. On a personal scale, this kind of identity theft can be disastrous. For a company, it can lead

to loss of revenue, delays, and loss of customers. Another growing form of computer nuisance is the sending of spam, or unsolicited e-mail. Measures are underway in many countries to make spam illegal, because it threatens to destroy people's ability to send and receive e-mail.

Investigating and stopping computer crime is difficult. Hacking is often not difficult to accomplish and the tools required to hack are freely available. Many hackers argue that hacking is often a victimless crime. Additionally, the Internet is international and the hacker is anonymous, which makes it hard to pursue and catch them. One answer is to step up computer security but, in reality, anti-virus software can only, by definition, deal with known viruses and so the software is always one step behind the inventive hacker.

Investigation of computer crime is also challenging because it can be hard to prove that a crime has actually been committed. Data can be manipulated after the event, because the hacker is rarely caught soon after the crime. Successful prosecutions are rare and punishments tend not be severe.

While computer forensics and approaches to investigation continue to develop, it is up to the individual and organizations to find ways of improving their computer security. Sometimes crimes are committed just by guessing someone's password. Longer passwords are harder to guess, therefore, most security experts recommend using passwords of at least 6–8 characters where possible. It may also help to get the hackers to turn their talents to helping the people they once attacked, by pointing out the weak points in their systems.

Despite the challenges, there have been some successful prosecutions of computer criminals. Recently, the U.S. government caught up with 19 individuals who ran one of the world's largest online centres for trafficking in stolen identities and financial fraud. The team, from the U.S. and several other countries, ran a site called Shadow crew with 4,000 members dedicated to computer hacking for obtaining counterfeit documents, as well as stealing credit and debit card numbers. The U.S. Secret Service spent a year tracking down the gang. While operating, the gang had trafficked in at least 1.7 million stolen credit cards, causing losses in excess of four million dollars. In short, the site acted as a "one stop shop" for identity theft . They will trade no longer, and the successful conclusion of this case gives investigators renewed confidence in the fight against computer crime.

6.2 Give the English equivalents to the following words and expressions.

1. мошенничество с кредитными картами
2. недавний обзор
3. намеренное проникновение

4. уязвимый
5. жертва
6. разрушать данные
7. скрытые инструкции
8. удачно, метко
9. свидетельство, доказательство, подтверждение
10. кража личных данных
11. потеря дохода
12. в личном масштабе
13. неприятность
14. преследовать
15. наказание
16. виновник преступления

6.3 Answer the questions.

1. What is the most widespread criminal activity in the world today?
2. What illegal activities are the most frequent in computer crimes?
3. Is infecting computer always connected with the loss of valuable data? Give your reasons.
4. How is deliberate penetration of a computer system called?
5. How can you protect your computer from attacks?
6. What harm does Trojan horse do?
7. What is a logic bomb?
8. What consequences after identifying theft can be for the company?
9. Is investigating and stopping computer crime challenging?
10. Why is successful prosecution very rare?
11. What should password contain?
12. Have you ever been hacked?
13. What anti-virus programs do you use?

Viruses
6.4 Read the text.

Computer viruses are programs that spread from one computer to another, causing problems on each computer they touch. As viruses propagate, they use up so much memory that it can slow down computer systems to the point that they are unusable. Some viruses actually attack files on the computer by deleting them or modifying them in some way that renders the computer unusable.

The extent of damage caused by a virus varies. Some affect a relatively small number of computers. Others have been so devastating that they can even cripple large companies. For example, in March 1999, when the Melissa virus hit, it was so

destructive that it forced Microsoft and other large companies to completely shut down their e-mail systems until the virus could be contained.

There are four general types of computer viruses:

Viruses. These are small programs that attach themselves to other programs. When a user runs the legitimate program, the virus program runs, too. Once on a computer, some viruses find other vulnerable programs and attach to them as well, causing even more damage. The virus spreads to other computers when the unknowing user shares or passes on an infected program via CD, for example.

E-mail viruses. These are viruses that are transmitted via e-mail. When users open an e-mail message or an e-mail attachment containing a virus, they release it onto their computers. Some e-mail viruses replicate themselves by e-mailing themselves to people listed in a victim's e-mail address book.

Worms. These are small programs that usually take advantage of networks and spread to all computers on the network. Worms scan networks for computers with security holes in programs or operating systems, replicate themselves on those computers, and then start all over from there. Because worms usually spread through networks, they can affect multiple
computers in a very short amount of time. The Slammer worm, released in January 2003, spread more rapidly than any other virus before it. Within 15 minutes, it had shut down cell phone and Internet service for millions of people around the world.

Trojan horses. These are computer programs that claim to be one thing but are actually viruses that damage the computer when the user runs them. Trojan horses cannot replicate automatically.

Because viruses have the potential to wreak havoc on computer networks and individual computers, many virus-protection products have been developed to prevent this. Most virus-protection software scans the computer when it is first turned on and looks for known viruses. As new viruses are discovered, virus protection providers have to update their virus definitions.

FIREWALLS

A firewall is basically a barrier that prevents damaging files or programs from reaching the user's computer. Many operating systems now include a built-in firewall. There are also many after-market firewall products available for purchase. Firewalls filter the data that comes through an Internet connection. If the firewall detects any suspicious information, it does not allow that information through. Most companies and many individuals who have Internet access use firewalls to protect their computers and networks. Although some firewalls protect against computer viruses, many experts recommend that companies and individuals invest in a separate anti-virus software package.

6.5 Read the statements and say whether they are true or false.

1. Computer viruses cause problems on every computer when spreading from one to another.
2. Virus propagation slows down a computer system.
3. Viruses can be so devastating that can force some companies to stop their business.
4. There are 3 main kinds of viruses.
5. Worms are usually spread over the Internet.
6. The Trojan horse can reproduce itself.
7. Virus protection providers have to update their programs every year.
8. Many experts do not recommend companies to invest in a separate anti-virus software package if they have a built-in firewall.
9. Viruses attach themselves to vulnerable programs.
10. Viruses spread through user shares or CDs.

6.6 Match the expressions with their Russian equivalents.

1. the extent of damage	a) покупка
2. to affect something	b) изменять файлы
3. to modify files	c) вынужден обновлять
4. a short amount of time	d) оказывать влияние на что-то
5. to replicate itself	e) подозрительная информация
6. to turn on the computer	f) степень повреждения
7. have to update	g) встроенный брандмауэр
8. a built-in firewall	h) короткий промежуток времени
9. purchase	i) самовоспроизводиться
10. suspicious information	j) включать компьютер

6.7 Match the words with the same meaning.

1. to cripple	a) to replicate
2. to take advantage	b) to do harm
3. to reproduce	c) to use
4. to spread	d) to search
5. to look for	e) to propagate

6.8 Fill in the blanks with the following words.

malicious	inaccessible	threats	tool	legislation	benefit
access	to cripple	restricted	consequences		

Computer hackers are people who gain remote (1) … (typically unauthorized and unapproved) to files stored in another computer, or even to the operating system of the computer. In the 1950 and 1960s, hackers were motivated more by a desire to learn the operating characteristics of a computer than by any (2) … intent. Indeed, in those days hackers were often legitimate computer programmers who were seeking ways of routing information more quickly through the then-cumbersome operating system of computers.

Since then, however, computer hacking has become much more sophisticated, organized, and, in many cases, illegal. Some hackers are motivated by a desire (3) … sensitive sites, mischief, and to acquire (4) … information.

In the late 1990s, several computer hackers attempted to gain access to files in the computer network at the Pentagon. The incidents, which were dubbed Solar Sunrise, were regarded as a dress rehearsal for a later and more malicious cyber-attack, and stimulated a revamping of the military's computer defenses. In another example, computer hackers were able to gain access to patient files at the Indiana University School of Medicine in February 2003.

The (5) … to civilian privacy and national security from computer hackers was deemed so urgent that the U.S. government enacted the Cyber-Security Enhancement Act in July 2002, as part of the Homeland Security measures in the wake of the terrorist attacks on September 11, 2001. Under this (6) … hackers can be regarded as terrorists, and can be imprisoned for up to 20 years.

One (7) … that a hacker can use to compromise an individual computer or a computer network is a virus. Depending on their design and intent, the (8) ... of a virus can range from the inconvenient (i.e., defacing of a Web site) to the catastrophic (i.e., disabling of a computer network). Within a few years during the 1990s, the number of known computer viruses increased to over 30,000. That number is now upwards of 100,000, with new viruses appearing virtually daily.

Despite the threat that they can pose, computer hackers can also be of (9) … By exposing the flaws in a computer network, hackers can aid in the redesign of the system to make information more (10) … to unauthorized access.

6.9 Match the words with their definitions.

1. cumbersome
2. sophisticated
3. to revamp
4. to cripple
5. legislation
6. rehearsal

a) a law or a set of laws, made official by a Parliament

b) awkward because of being large, heavy or not effective

c) to cause serious damage

d) time when all the people involved practice to prepare for the performance

e) complicated

f) to change or arrange smth again in order to improve it

Unit 7. ARTIFICIAL INTELLIGENCE

Text A

What Does Artificial Intelligence (AI) mean?

7.1 Read the text.

Artificial intelligence (AI), also known as machine intelligence, is a branch of computer science that focuses on building and managing technology that can learn to autonomously make decisions and carry out actions on behalf of a human being.

AI is not a single technology. It is an umbrella term that includes any type of software or hardware component that supports machine learning, computer vision, natural language understanding (NLU) and natural language processing (NLP). Today's AI uses conventional CMOS hardware and the same basic algorithmic functions that drive traditional software. Future generations of AI are expected to inspire new types of brain-inspired circuits and architectures that can make data driven decisions faster and more accurately than a human being can.

What are the 4 types of AI and how do they differ?

AI initiatives are often talked about in terms of their belonging to one of four categories:

1. Reactive AI relies on real-time data to make decisions.

2. Limited Memory AI relies on stored data to make decisions.

3. Theory of Mind AI can consider subjective elements such as user intent when making decisions.

4. Self-Aware AI possesses a human-like consciousness that is capable of independently setting goals and using data to decide the best way to achieve an objective.

A good way to visualize these distinctions is to imagine AI as a professional poker player. A reactive player bases all decisions on the current hand in play, while a limited memory player will consider their own and other player's past decisions.

A Theory of Mind player factors in other player's behavioral cues and finally, a self-aware professional AI player stops to consider if playing poker to make a living is really the best use of their time and effort.

The Evolving Stages of Artificial Intelligence

The demand for faster, more energy-efficient information processing is growing

exponentially as AI becomes more prevalent in business applications. Conventional digital processing hardware cannot keep up with this demand. That is why researchers are taking inspiration from the brain and considering alternative architectures in which networks of artificial neurons and synapses process information with high speed and adaptive learning capabilities in an energy-efficient, scalable manner.

*Narrow (Weak) AI is capable of performing only a limited set of predetermined functions.

General (Strong) AI is said to equal the human mind's ability to function autonomously according to a wide set of stimuli;

Super AI is expected one day to exceed human intelligence (and conceivably take over the world).

At this time, Narrow AI is only beginning to enter mainstream computing applications.

Artificial Intelligence on a Practical Level

AI is currently being applied to a range of functions both in the lab and in commercial/consumer settings, including the following technologies:

Speech Recognition allows an intelligent system to convert human speech into text or code.

Natural Language Processing enables conversational interaction between humans and computers.

Computer Vision allows a machine to scan an image and use comparative analysis to identify objects in the image.

Machine learning focuses on building algorithmic models that can identify patterns and relationships in data.

Expert systems gain knowledge about a specific subject and can solve problems as accurately as a human expert on this subject.

7.2 Answer the following questions.

1. What does the term AI include?
2. What is expected from future generations of AI?
3. What categories of AI do you know?
4. Where is AI currently applied?
5. How are the objects identified applying Computer Vision?

7.3 Translate the following text from Russian into English.

Искусственный интеллект

Искусственный интеллект, ИИ (artificial intelligence. AI) – это принятое в информатике обозначение программных систем, способных моделировать интеллектуальную деятельность человека. Выполняя задачи, ИИ постепенно обучается, используя собранную информацию. Этим же термином называют раздел информатики, посвящённый разработке таких систем.

Мифы об искусственном интеллекте

В массовой культуре распространён миф о том, что развитие ИИ может лишить человечество работы и даже поставить под угрозу его существование. Однако из-за неразрешимых фундаментальных проблем реальность такого будущего сомнительна.

Первая проблема – отсутствие в действиях любого ИИ человеческой осмысленности. Например, в онлайн-переводчик заложены результаты статистического анализа перевода слов и построения предложений. Какой бы огромной ни была выборка данных и насколько совершенным ни были бы алгоритмы, любая статистическая система всегда будет допускать ошибки, поскольку она не осознает точный смысл фразы.

Во-вторых, ИИ недостаёт самостоятельности. Любая система статистического машинного обучения требует огромных объёмов специальным образом подготовленных (размеченных) данных. А человеку для обучения хватает очень малого количества примеров. Нам достаточно посмотреть на одну фотографию нового для нас вида животного, чтобы научиться его отличать, а нейронным сетям для этого требуются тысячи специальным образом подготовленных изображений. При этом областей деятельности, для которых большие данные в принципе существуют, не так уж и много.

Наконец, универсальных систем ИИ не существует. Все они узкой специализации. Есть множество интеллектуальных систем, автоматизирующих самые разные виды умственной деятельности – от игры в шахматы до анализа ситуации на дорогах или распознавания речи. Однако, ни одна из них не способна выйти за пределы своей области – поскольку она для этого и не предназначена. А теории построения общего, т.е. универсального ИИ пока не существует.

Text B

AI

7.4 Memorize the following words and phrases.

highly mathematical statistical learning	высокоразвитое математико-статистическое машинное обучение
draw up	составлять
endowed	наделённый
antiquity	древность
steer	управлять
arbitrary	произвольный
issue	вопрос, проблема, тема
capacity	производительность, объем, ёмкость, способность
approach	метод, подход, приближение
particular	конкретный, особенный

7.5 Read the text.

Artificial intelligence (AI) is intelligence demonstrated by machines, as opposed to the natural intelligence displayed by animals including humans. AI research has been defined as the field of study of intelligent agents, which refers to any system that perceives its environment and takes actions that maximize its chance of achieving its goals.

The term "artificial intelligence" had previously been used to describe machines that mimic and display "human" cognitive skills that are associated with the human mind, such as "learning" and "problem-solving". This definition has since been rejected by major AI researchers who now describe AI in terms of rationality and acting rationally, which does not limit how intelligence can be articulated.

AI applications include advanced web search engines (e.g., Google), recommendation systems (used by YouTube, Amazon and Netflix), understanding human speech (such as Siri and Alexa), self-driving cars (e.g., Tesla), automated decision-making and competing at the highest level in strategic game systems (such as chess and Go). As machines become increasingly capable, tasks considered to require "intelligence" are often removed from the definition of AI, a phenomenon known as the

AI effect. For instance, optical character recognition is frequently excluded from things considered to be AI, having become a routine technology.

Artificial intelligence was founded as an academic discipline in 1956, and in the years since has experienced several waves of optimism, followed by disappointment and the loss of funding (known as an "AI winter") followed by new approaches, success and renewed funding. AI research has tried and discarded many different approaches since its founding, including simulating the brain, modeling human problem solving, formal logic, large databases of knowledge and imitating animal behavior.

In the first decades of the 21st century, highly mathematical-statistical machine learning has dominated the field, and this technique has proved highly successful, helping to solve many challenging problems throughout industry and academia.

The various subfields of AI research are centered around particular goals and the use of particular tools. The traditional goals of AI research include reasoning, knowledge representation, planning, learning, natural language processing, perception, and the ability to move and manipulate objects. General intelligence (the ability to solve an arbitrary problem) is among the field's long-term goals. To solve these problems, AI researchers have adapted and integrated a wide range of problem-solving techniques – including search and mathematical optimization, formal logic, artificial neural networks, and methods based on statistics, probability and economics. AI also draws upon computer science, psychology, linguistics, philosophy, and many other fields.

The field was founded on the assumption that human intelligence "can be so precisely described that a machine can be made to simulate it". This raised philosophical arguments about the mind and the ethical consequences of creating artificial beings endowed with human-like intelligence; these issues have previously been explored by myth, fiction and philosophy since antiquity. Computer scientists and philosophers have since suggested that AI may become an existential risk to humanity if its rational capacities are not steered towards beneficial goals.

7.6 Answer the following questions.

1. What is AI?
2. What was the term (AI) used previously?
3. What does AI include?
4. What are the traditional goals of AI?
5. What are the long-term goals of AI?
6. Name the constituents of AI.

7.7 Match the words with the same meaning.

1. goal   a) demand
2. decide   b) reach
3. achieve   c) purpose
4. precisely   d) solve
5. require   e) exactly

7.8 Match the words with the opposite meaning.

1. artificial   a) harmony
2. antiquity   b) exclude
3. include   c) find
4. lose   d) modernity
5. argument   e) natural

7.9 Read the text and fill in the blanks with the following words.

humanity   processing   psychology   recognition   include

1. AI applications … advanced web search engines.
2. Optical character … have become a routine technology.
3. The traditional goals of AI research include reasoning, knowledge representation, planning learning and natural language …
4. …, linguistics, philosophy, and computer science are connected with AI.
5. AI may become a risk to ….

7.10 Translate the following word groups.

human speech
understanding human speech
optical character recognition
problem solving
problem solving technique
animal behavior
long-term goal
artificial neural networks
automated decision making

recommendation system

7.11 Translate the sentences from English into Russian.

1. Do not forget that the employer is likely to be interested in the specialist who has received a higher education.
2. The programmer is required to know special programming languages.
3. Staff who used to exchange confidential information in person have transferred these communications to email, with such unprotected messages posing one of the greatest risks for businesses today.
4. Proper application of computing equipment in different industries is likely to result in proper management, effective distribution of materials and resources, more efficient production and trade.
5. Digital computers are considered to be simple machines.
6. The more switches a computer checks in one cycle, the more data it can recognize at one time and the faster it can operate, each switch being called a binary digit or bit.
7. The global robotics industry is expected to be worth 80 billion USD by 2024.
8. Most future home networks, however, are likely to be wireless network systems, using tuned transmitter and receiver devices.
9. The question being too difficult, no one could answer it.
10. Not having to worry about upgrading to the last version of your office suite leaves business with more time.
11. Light is recognized to be amplified in the same way as microwaves.
12. Copper being a good conductor, we were asked to use it when carrying on our research work.
13. The new hydro-electric station being put into operation, the surrounding enterprises will be supplied with electric power.
14. It is very rare for an e-commerce business to handle all these elements by itself.
15. Organizations are more likely to migrate mission-critical workloads to public clouds.

Unit 8. CLOUD COMPUTING

Text A

What is cloud computing?

8.1 Memorize the following words.

cloud computing	облачные вычисления
proprietary network	собственная сеть
implementation	выполнение, реализация
on-demand computing	вычисления по требованию
the front end	внешний интерфейс
back end	серверное приложение
middleware	промежуточное ПО
workload	объем работы, загруженность
chargeback	возвратный платёж

8.2 Read the text.

Cloud computing is a general term for anything that involves delivering hosted services over the internet. These services are divided into three main categories or types of cloud computing: infrastructure as a service (IaaS), platform as a service (PaaS) and software as a service (SaaS).

A cloud can be private or public. A public cloud sells services to anyone on the internet. A private cloud is a proprietary network or a data center that supplies hosted services to a limited number of people, with certain access and permissions settings. Private or public, the goal of cloud computing is to provide easy, scalable access to computing resources and IT services.

Cloud infrastructure involves the hardware and software components required for proper implementation of a cloud computing model. Cloud computing can also be thought of as utility computing or on-demand computing.

The name **cloud computing** was inspired by the cloud symbol that's often used to represent the internet in flowcharts and diagrams.

How does cloud computing work?

Cloud computing works by enabling client devices to access data and cloud applications over the internet from remote physical servers, databases and computers.

What is public cloud? Everything you need to know.

An internet network connection links the <u>front end</u>, which includes the accessing client device, browser, network and cloud software applications, with the back end, which consists of databases, servers and computers. The back end functions as a repository, storing data that is accessed by the front end.

Communications between the front and back ends are managed by a central server. The central server relies on protocols to facilitate the exchange of data. The central server uses both software and middleware to manage connectivity between different client devices and cloud servers. Typically, there is a dedicated server for each individual application or workload.

Cloud computing relies heavily on virtualization and automation technologies. Virtualization enables the easy abstraction and provisioning of services and underlying cloud systems into logical entities that users can request and utilize. Automation and accompanying orchestration capabilities provide users with a high degree of self-service to provision resources, connect services and deploy workloads without direct intervention from the cloud provider's IT staff.

Types of cloud computing services

Cloud computing can be separated into three general service delivery categories or forms of cloud computing:

1. **IaaS.** IaaS providers, such as Amazon Web Services (AWS), supply a virtual server instance and storage, as well as application programming interfaces (APIs) that let users migrate workloads to a virtual machine (VM). Users have an allocated storage capacity and can start, stop, access and configure the VM and storage as desired. IaaS providers offer small, medium, large, extra-large, and memory- or compute-optimized instances, in addition to enabling customization of instances, for various workload needs. The IaaS cloud model is closest to a remote data center for business users.

2. **PaaS.** In the PaaS model, cloud providers host development tools on their infrastructures. Users access these tools over the internet using APIs, web portals or gateway software. PaaS is used for general software development, and many PaaS providers host the software after it's developed. Common PaaS products include Salesforce's Lightning Platform, AWS Elastic Beanstalk and Google App Engine.

3. **SaaS.** SaaS is a distribution model that delivers software applications over the internet; these applications are often called *web services*. Users can access SaaS applications and services from any location using a computer or mobile device that has internet access. In the SaaS model, users gain access to application software and databases. One common example of a SaaS application is Microsoft 365 for productivity and email services.

Cloud computing deployment models

Private cloud services are delivered from a business's data center to internal users. With a private cloud, an organization builds and maintains its own underlying cloud infrastructure. This model offers the versatility and convenience of the cloud, while preserving the management, control and security common to local data centers. Internal users might or might not be billed for services through IT chargeback. Common private cloud technologies and vendors include VMware and OpenStack.

In the public cloud model, a third-party cloud service provider (CSP) delivers the cloud service over the internet. Public cloud services are sold on demand, typically by the minute or hour, though long-term commitments are available for many services. Customers only pay for the central processing unit cycles, storage or bandwidth they consume. Leading public CSPs include AWS, Microsoft Azure, IBM and Google Cloud Platform (GCP), as well as IBM, Oracle and Tencent.

A hybrid cloud is a combination of public cloud services and an on-premises private cloud, with orchestration and automation between the two. Companies can run mission-critical workloads or sensitive applications on the private cloud and use the public cloud to handle workload bursts or spikes in demand. The goal of a hybrid cloud is to create a unified, automated, scalable environment that takes advantage of all that a public cloud infrastructure can provide, while still maintaining control over mission-critical data.

In addition, organizations are increasingly embracing a multi-cloud model, or the use of multiple IaaS providers. This enables applications to migrate between different cloud providers or to even operate concurrently across two or more cloud providers.

Organizations adopt multi-cloud for various reasons. For example, they could do so to minimize the risk of a cloud service outage or to take advantage of more competitive pricing from a particular provider. Multi-cloud implementation and application development can be a challenge because of the differences between cloud providers' services and APIs.

8.3 Answer the questions.

1. What is cloud computing?
2. How many categories of cloud computing are there?
3. What is a private cloud?
4. What is a public cloud?
5. What does the cloud infrastructure involve?
6. What does an internet connection link together?
7. What is the main purpose of cloud computing?
8. What does cloud computing rely on?

9. How many general service delivery categories is cloud computing separated into? What are they?

8.4 Memorize the following abbreviations.

API	application programming interface
AWS	Amazon Web Services
VM	virtual machine
IaaS	infrastructure as a service
PaaS	platform as a service
SaaS	software as a service
CSP	cloud service provider

Text B.

Cloud computing

8.5 Memorize the following words and phrases.

downtime	время простоя
complication	сложность, трудность
incompatibility	несовместимость
compliance	соответствие, соблюдение
continuity	целостность, преемственность

8.6 Read the text and answer the questions.

1. What are the characteristics and advantages of cloud computing?
2. What are the disadvantages?

Characteristics and advantages of cloud computing

Cloud computing has been around for several decades now, and today's cloud computing infrastructure demonstrates an array of characteristics that have brought meaningful benefits for businesses of all sizes. Some of the main characteristics of cloud computing are the following:

Self-service provisioning. End users can spin up compute resources for almost any type of workload on demand. An end user can provision computing capabilities, such as server time and network storage, eliminating the traditional need for IT administrators to provision and manage compute resources.

Elasticity. Companies can freely scale up as computing needs increase and scale down again as demands decrease. This eliminates the need for massive investments in local infrastructure, which might or might not remain active.

Pay per use. Compute resources are measured at a granular level, enabling users to pay only for the resources and workloads they use.

Workload resilience. CSPs often implement redundant resources to ensure resilient storage and to keep users' important workloads running – often across multiple global regions.

Migration flexibility. Organizations can move certain workloads to or from the cloud – or to different cloud platforms – as desired or automatically for better cost savings or to use new services as they emerge.

Broad network access. A user can access cloud data or upload data to the cloud from anywhere with an internet connection using any device.

Multi-tenancy and resource pooling. Multi-tenancy lets numerous customers share the same physical infrastructures or the same applications yet still retain privacy and security over their own data. With resource pooling, cloud providers service numerous customers from the same physical resources. The resource pools of the cloud providers should be large and flexible enough so they can service the requirements of multiple customers.

These characteristics support a variety of important benefits for modern business, including the following:

Cost management. Using cloud infrastructure can reduce capital costs, as organizations don't have to spend massive amounts of money buying and maintaining equipment. This reduces their capital expenditure costs – as they don't have to invest in hardware, facilities, utilities or building large data centers to accommodate their growing businesses. Additionally, companies don't need large IT teams to handle cloud data center operations because they can rely on the expertise of their cloud providers' teams. Cloud computing also cuts costs related to downtime. Since downtime rarely happens in cloud computing, companies don't have to spend time and money to fix any issues that might be related to downtime.

Data and workload mobility. Storing information in the cloud means that users can access it from anywhere with any device with just an internet connection. That means users don't have to carry around USB drives, an external hard drive or multiple CDs to access their data. Users can access corporate data via smartphones and other mobile devices, enabling remote employees to stay up to date with co-workers and customers. End users can easily process, store, retrieve and recover resources in the cloud. In

addition, cloud vendors provide all the upgrades and updates automatically, saving time and effort.

Business continuity and disaster recovery (BCDR). All organizations worry about data loss. Storing data in the cloud guarantees that users can always access their data even if their devices, e.g., laptops or smartphones, are inoperable. With cloud-based services, organizations can quickly recover their data in the event of emergencies, such as natural disasters or power outages. This benefits BCDR and helps ensure that workloads and data are available even if the business suffers damage or disruption.

Disadvantages of cloud computing

Despite the clear upsides to relying on cloud services, cloud computing carries its own challenges for IT professionals.

The most important of them are: **cloud security, cost unpredictability, lack of capability and expertise, compliance with industry laws.**

8.7 Match the terms with their definitions.

1. Cloud security	a) It can be difficult to manage compliance with industry regulations through a third party. You need to know where data and workloads are actually hosted.
2. Cost unpredictability	b) When relying on the cloud organizations risk data breaches.
3. Lack of capability and expertise	c) Utilizing other cloud services can create additional unplanned cloud costs.
4. Compliance with industry laws	d) Organizations struggle to keep up with the growing demand for tools and employees with proper skill sets and knowledge.

8.8 Match the terms with their definitions.

1. Self-service provisioning	a) The company can scale up or scale down computer needs, that eliminates massive investments in local infrastructure

2.Elasticity	b) Cloud service providers often implement redundant resources to ensure storage and keep running important workloads.
3. Workload resilience	c) An end user can be provided with server time and network storage n demand, that eliminates the traditional need for IT administration.
4. Pay per use	d) Using cloud infrastructure reduces capital expenditure costs, as they don't have to invest in hardware, IT teams, utilities, data centres
5. Migration flexibility	e) Organizations can easily recover lost data in case of emergencies.
6. Broad network access	f) Numerous customers share the same physical infrastructures and applications, retaining privacy and security.
7. Multi – tenancy and resource pooling	g) A user can access cloud data or upload data to cloud from anywhere
8. Cost management	I) Users pay only for resources and workloads they use.
9. Business continuity and disaster recovery	j) Workloads can be moved to or from the cloud as desired for better cost savings.

8.9 Match the words with their Russian equivalents.

1. time-sharing	a) осязаемое форма
2. tangible shape	b) требования к безопасности
3. decision-makers	c) внешний интерфейс
4. redundant resources	d) увеличение масштаба
5. security measures	e) гибкость, адаптационная способность
6. front end	f) выделенный сервер
7. back end	g) совместное использование времени
8. dedicated server	h) лица, принимающие решение
9. scale up	i) избыточные ресурсы
10. elasticity	j) серверное приложение

8.10 Read the text and insert appropriate word from the box.

> **theft   environment   access   security   share**

Security remains a primary concern for businesses contemplating cloud adoption -- especially public cloud adoption. Public CSPs 1) … their underlying hardware infrastructure between numerous customers, as the public cloud is a multi-tenant 2) … . This environment demands significant isolation between logical compute resources. At the same time, 3) ... to public cloud storage and compute resources is guarded by account login credentials.

Many organizations bound by complex regulatory obligations and governance standards are still hesitant to place data or workloads in the public cloud for fear of outages, loss or 4) ... However, this resistance is fading, as logical isolation has proven reliable and the addition of data encryption and various identity and access management tools have improved 5)... within the public cloud.

Ultimately, the responsibility for establishing and maintaining a secure cloud environment falls to the individual business user that is responsible for building the workload's architecture – the combination of cloud resources and services in which the workload runs – and implementing the security features that the cloud provider offers.

Grammar references

1. Degrees of comparison

Comparative and superlative forms

	Comparative form (two things)	Superlative form (more than two things)
Adjectives/Adverbs with one syllable	*Add -(e)r:* Large - larger small - smaller fast - faster	*Add -(e)st:* Large - the largest small - the smallest fast - the fastest
Adjectives/Adverbs with two or more syllables	*use **more/less** + adjective/adverb:* e.g. useful - **more/less** useful expensive - **more/less** expensive interesting - **more/less** interesting Rapidly -	*use the most/the least + adjective:* e.g.useful - **the most/least** useful expensive - **the most/least** expensive interesting - **the most/least** interesting
irregular adjectives/adverbs	bad/badly- **worse** good/well - **better** far - **farther/further** little - **less** much - **more**	bad/badly - **the worst** good/well - **the best** far - **the farthest/furthest** little- **the least** much - **the most**

Spelling rules.
- Change y to i after consonants: e.g. *dry - drier/the driest.*
- Double final consonant if the final syllable contains short vowel: e.g. *big-bigger*
- Two syllable adjectives where the second syllable is unstressed (often with - **y, -ly, -ow, or -l** at the end) can form comparative and superlative forms in the same way as one-syllable adjectives: e.g. *friendly-friendlier/the friendliest.*

Comparative adjectives.
Comparative adjectives are used to compare two things. When we use a comparative adjective in front of a noun we add **than**:
e. g. *This program is more reliable **than** the previous one.*
We use **object pronouns** (me, her, etc.), **not** subject pronouns (1, she, etc.) **after than**:
e. g. *Maria is better at Maths **than me**.*
We can use two comparatives to show that something is changing.
e.g. *The Tasks are getting **easier and easier**.*
*Peripherals are becoming **more and more expensive** these days.*

Superlative adjectives

We use superlative adjectives to compare more than two things. We use 'the' or a possessive adjective (my/your/his, etc.) before the superlative form:

*e.g. This company creates **the most powerful** batteries in the world. What was **your best** subject at school?*

Comparison with as … as.
Use *as+adjective/adverb+as* to compare two people, things or places that are the same or equal.
e. g. This application is **as old as** that one.
Your computer runs **as fast as** mine

1. Complete the table.

Adjective	Comparative form	Superlative form
new	*newer*	*the newest*
responsible		
successful		
heavy		
far		
small		
cheap		
slim		

2. Look at the table. Then complete the sentences with the comparative form of adjectives and adverbs in brackets.

Product details	P800	FX2	G32
Screen size Weight	15 inches 1.3 kilograms	17 inches 1.5 kilograms	14 inches 1.7 kilograms
Amount of time on the market Cost	12 months $ 799	2 months $899	8 months $699

Customer ratings	P800	FX2	G32
Starts quickly	***	**	***
Runs reliably	*****	****	***
Operates quietly	****	***	*****
Displays pictures well	***	*****	****

1. (large/small) The screen of the P800 is <u>larger than</u> the G-30's, but it is … FX2's.
2. (light/heavy) The FX 2 is … the G32, but it is … the P800.
3. (new/old) The G32 is … the P800, but it is … the FX2.

4. (cheap/expensive) The P800 is … the FX2, but it is … the G32.
5. (quickly/slowly) The P800 starts … the FX2, but … the G32.
6. (reliably) The P800 runs … the FX2 or the G32.
7. (quietly) The G32 operates … the P800 or the FX2.
8. (well) The FX2 displays pictures … the P800 or the G32.

3. Complete the following questions with the superlative forms of the adjectives or adverbs given in brackets.

1. At what time of the day do you work **most efficiently**? (efficiently)
2. What is … subject you're studying now? (difficult)
3. What is … way for you to get the university? (fast)
4. Who is … student in you group? (tall)
5. What is … classroom in the university campus? (comfortable)
6. What is … operating system to write codes? (good)

4. Ask and answer the questions from exercise 3.

5. Use the words to make comparison with as … as.

Model: Desktop computer / be / popular / laptops
Desktop computers **are as popular as laptops**.

1. Wired charges / work / well / wireless chargers.
_____
2. Mobile phones / process / data / fast / desktop computers.
_____
3. He / have / lessons / frequently / I.
_____
4. My computer / be / old / Lucy's.
_____
5. The new tablet / not start up / quickly / the old one.
_____

2. Present Simple/Present Continuous

Forms

Form	Present Simple Tense	Form	Present Continuous Tense
Positive	I *work* from Monday to Friday. He *works* three days a week.	Positive	I**'m** work**ing** on a new program at the moment. He**'s** work**ing** in a team now.
Negative	I **don't** *work* on Saturday. He **doesn't** *work* on Tuesday.	Negative	I**'m not** work**ing** in a team now. He **isn't** work**ing** at the moment.
Questions	**Do** you *work* at the weekends? Yes, I *do.*/No, I *don't.* **Does** she *work* on Sunday? Yes, she **does**. /No, she **doesn't**.	Questions	**Are** you work**ing** on a new program now? - Yes, I *am.*/No, I*'m not.* **Is** he work**ing** at the moment? Yes, he *is.*/No, he *isn't.*

Basic difference in use

Present Simple	Present Continuous
Permanent situations; things we don't expect to change. e.g. He **works** for an IT company.	***Temporary situations, for a limited time period.*** e.g. John **is working** from home this week. <u>Time expressions</u>: today, this week, at the moment.
Regular actions, habits and routines. e.g. Jim is a programmer. He **writes** codes. <u>Time expressions</u>: usually, always, often, sometimes, every day, once a month, etc.	***Actions that are happening now or around the time we're speaking.*** e.g. Jim **is writing** a new code now. <u>Time expressions</u>: now, at the moment, today.
Permanent situations; things we don't expect to change. e.g. Programmers usually train for four years to get higher education.	***Something that is changing.*** *e.g. More and more people are training to become programmers these days.*

Action/Non-action verbs.
- Verbs that describe actions, e.g. work, live, make can be used in the present simple or

continuous. I**'m making** a report now. I **make** reports every month.
- Verbs that describe states or feelings (**not** actions), e,g, need, like, are non-action verbs. They aren't usually used in the present continuous.
- Common non-action verbs: agree, be, believe, belong, depend, forget, hear, know, need, prefer, recognize, seem, understand, want.

1. Choose the correct form, present simple or present continuous.

Model: I *don't believe* / *I'm not believing* that you made this program yourself.

1. Come on, let's check the program. Jim *waits / is waiting* for us.
2. Lucy doesn't *want / isn't wanting* to check the program now. She is tired.
3. Our boss is ill, so he *doesn't work / isn't working* today.
4. The app *seems / is seeming* very expensive for me.
5. We haven't fixed the problem and now we *try / are trying* to solve it.
6. Everyone *thinks / is thinking* we have enough time to complete the task.
7. *Do you need / Are you needing* to install an antivirus now?
8. Can I call you back? *I have / I'm having* a class now.
9. I wasn't very good at computers, but now *I know / I'm knowing* how to do many things.
10. Modern computers *become / are becoming* smarter and smarter.

2. Complete with the present simple or present continuous forms of the verbs in brackets.

Model: We **don't buy** new gadgets very often. (not buy)

1. Jane usually … all day in the summer but today she … at 12:30. (work, stop)
2. She usually … with a team, but now she … her own project. (work, have)
3. I … John's mobile because I left mine at home. (use)
4. My friend … patiently for his exam results. (wait)
5. Things … more and more difficult to solve. (get)
6. … you … how to create apps? (know)
7. Don't use C++ if you … it. (not like)
8. I sometimes … programs for different operating systems. (create)
9. What … she … at the moment? She looks very busy. (develop)
10. I only … the scanner about once a month. (use)

3. Find and correct the mistakes in the sentences.

1. The computer is consisting of software and hardware.
2. Electronic devices are get more and more advanced every day.
3. I use PowerPoint to create a presentation at the moment.

4. Does Andrew has a laptop with him?
5. I'm knowing how to use this app.
6. Ann need help with her computer. She don't understand why it works so slowly.
7. This laptop is having a number of interesting features.

3. Present Perfect/Past Simple

Forms

Form	Present Perfect Tense	Form	Past Simple Tense
Positive	I **have (I've) finished**. He **has (He's) left**. We **have (We've) mended** it.	Positive	I **failed** the exam. He **stayed** with his friends last night. We **completed** the report yesterday.
Negative	I **have not (I haven't)** finished. He **has not (He hasn't)** left. We **have not (We haven't)** mended it.	Negative	I **did not (didn't) fail** the exam. He **did not (didn't) stay** with his friends last night. We **did not (didn't) complete** the report yesterday
Questions	**Have** you **finished**? (Yes, I **have**) **Has** he **left**? (No, he **hasn't**) Where **have** they **gone**?	Questions	**Did** you **pass** the exam? (Yes, I did) **Did** he **stay** with his friends last night? **Did** they **complete** the report yesterday?

Basic difference in use

Present Perfect	Past Simple
Single or repeated actions in the past, when we don't know the date of the action or it isn't important: **e.g.** *I've installed an operating system before.* *They've been to the lab many times.* **Time expressions**: before, ever, already, just and yet	Single or repeated actions that happened at a definite time in the past: **e.g.** *I installed a new operating system last week.* *We went to the maths lecture twice last month.* **Time expressions**: yesterday, last month, in 2015, etc.
Situations that started in the past and are still continuing: **e.g.** *John has worked for this enterprise for two years.* (He's	Situations that started and finished in the past: **e.g.** *George worked for this enterprise for two years.* (He isn't

working there now.)	working there now.)
with for + period of time, or since + date	with for to say how long the situation lasted
One or more completed actions in a time period that is still continuing:

e.g. *He's sold fifteen computers this month.*

Time expressions: this morning/evening, today, so far, etc. | Completed actions in a time period that is finished:

e.g. *He sold twenty computers in September.*
I bought a new laptop two weeks ago.

with ago to mean '(a period) before now' |

1. Choose the correct option in *italics*.

Model: I've been to the professor twice *this month/last month.*

1. She's used this program *many times / in 2018.*
2. Kate *passed / has passed* her final exam last Thursday.
3. Bob enjoys his job. He *did / has done* it since he was twenty-three.
4. Steve's bought many gadgets *this year / last year.*
5. Laura *has finished / finished* the course two months ago.

1. Complete the gaps with correct forms of the words in brackets

A small American car manufacturer (0)**has just announced (just announce)** that its experimental electric car, the Lexington X1, will go into production this year. Markton Automobiles, of Detroit, Michigan, (1)_____(make) the announcement at last month's Auto Show in Geneva.
Although there are now many electric cars on the market, so far manufacturers (2) _____ (not be able) to produce one that can really compete with existing petrol cars. There are two major problems - speed and distance. Up until now, electric cars (3)_____ (be) either too slow or unable to travel far enough without recharging their batteries. Markton Automobiles claim that they (4) _____ (overcome) these difficulties with a new type of solar panel which continually recharges the batteries. The company (5) _____ (not give) the press exact details yet, but they claim they (6)_____ (already test) the car successfully under all kinds of weather conditions.
A Japanese company (7)_____ (first design) the engine in 2007. But over the last few years Markton (8) _____ (adapt) the design and increased its power.
The company (9)_____ (invite) ten journalists to test-drive the new car last week. Their reports (10) _____ (be) mainly positive, although we will have to wait for the full

test results before we know if this really is the electric car that everyone is waiting for.

3. Find and correct the mistakes where necessary.

Model: I **installed** new application software yesterday. (right)
When **have** you **conducted** the experiment? (wrong) <u>When **did** you **conduct** the experiment?</u>

1. Did you pay him back yet?
2. I uploaded all the assignments a week ago.
3. When have you downloaded this game?
4. We've finished writing our test an hour ago.
5. They haven't used this app yet.
6. Have you ever created an application?
7. I spent much time doing my English homework yesterday.
8. Have you checked your email last night? I sent you the results.

4. Passive voice

Forms (be + past participle)

	Present	**Past**	**Future**
Simple	Programs are installed every day	The program was installed yesterday	The program will be installed tomorrow.
Continuous	The program is being installed now.	The program was being installed at 5 yesterday.	—
Perfect	The program has already been installed.	The program had been installed by 5 o'clock yesterday.	The program will have been installed by 5 o'clock tomorrow.
Perfect Continuous	—	—	—

Reasons for using the passive.

We often use the passive when we want to talk about an action rather than the person or thing that does the action. We do this when
• **it doesn't matter who does the action:**
e.g. *The votes will be counted at the end of the meeting.*
Have the documents been delivered?
• **we know or can guess who does the action:**
e.g. *Here's your skirt. It's been dry-cleaned. (obviously by the dry cleaner's)*
I brought my laptop to your service yesterday. Has it been repaired yet?
• **we don't know, or we don't want to say who does the action:**
e.g. *My laptop has been stolen! (I don't know who stole it.)*
• **we want to be polite or we are in a formal situation:**
e.g. *Have the reports been typed yet? (more polite than Have you typed the reports yet?)*
Your application will be assessed by the manager. (more formal than The manager will assess your application.)
• **if we want to say who or what does an action when using a passive verb, we use**
by+ noun.
e.g. *Microsoft corporation was founded by Bill Gates and Paul Allen.*

1.Choose the correct word in *italics* (active or passive).

Model: The university *built / was built* in the 20th century.

1. The data *are processing / are being processed* faster with this program.
2. This type of computer *hasn't used / hasn't been used* for nearly a decade.
3. A new IT specialist *sent / was sent* to a different department.
4. A group of students *has transformed / has been transformed* the program so every can use it.
5. They hadn't *conducted / hadn't been conducted* the experiment for very long before they got the positive results.
6. The python *used / is used* by many programmers to create different websites.
7. The information *will obtain / will be obtained* next week.
8. We *aren't recording / aren't being recorded* the results until next week.
9. My laptop *is repairing / is being repaired* at the moment.
10. I usually *install / 'm installed* operating systems myself.

2. Rewrite the sentences in the passive beginning with the words in bold.

1. Jonathan Ive designed **the IPhone.**
2. Bill Gates and Paul Allen founded **Microsoft** in 1975.
3. Netflix is a streaming service that offers **a wide variety of TV shows.**
4. In 2001 the company launched **the Yandex.**
5. Page and Brin originally nicknamed **the new search engine 'BackRub'.**
6. Microsoft didn't invent **laptop computers.**

3. Open the brackets using correct forms of the verbs.

1. Devices inside the computer … with buses. (connect)
2. The CPU … into a single chip. (build)
3. RAM capacity can … by adding extra chips. (expand)
4. The processor, the memory chips, expansion slots, and controllers … in the motherboard. (contained)
5. The power and performance of a computer … partly … by the speed of its processor. (determine)
6. My computer … to the internet yet. (not connect)
7. The results … tomorrow. (post)
8. The broken parts have to … as fast as possible. (replace)
9. Apple … as one the biggest smartphones manufacturing company. (know)
10. This site … by our engineers down while we upgrade our servers. (close)

4. Translate the following sentences.

1. Much attention must be paid to security.
2. Many large companies have created robots which can perform specific functions in the manner of a man.
3. Digitalization is not going to slow down.
4. Quality assurance is carried out through testing.
5. The tester analyses the computer game and documents the defects and errors found by him, which is part of the entire quality control process.
6. All work with the source code is done by programmers.
7. The process of creating computer games can be carried out either by one person or a team of developers.
8. The smallest fully functional computers are called laptop computers.
9. The speed and power of supercomputers, the highest class of computers, are almost beyond comprehension, and their capabilities are continually being improved.
10. All you have to do is to write down what is to be done at each step.
11. The Internet is the great invention ever and it has made a significant impact on our lives.
12. Much personal information about individuals is now stored in computer files.
13. With that growth in capability, there has been a dramatic expansion in the use of simulation for engineering design and research in science, engineering, social science and the humanities.
14. Three dimensional data storage will be able to store more information in a smaller space and offer faster data transfer times.
15. Devices that use light to store and read data have been the backbone of data storage for nearly two decades.
16. Mid-level developers have probably made a lot of the simplest mistakes and learned from them.
17. Obviously, the senior developer has far more knowledge than the junior and mid-level developer.
18. Break one big problem down into subtasks, which are much easier to solve.
19. High speed digital computers are playing an increasing role in all branches of the economy.
20. Input devices allow users to enter commands, data, or programs that are processed by the central processor.

5. Conditionals

Forms
A conditional sentence has two clauses: the *if* clause and the main clause.
There are four principal types of conditional sentences: conditional I. conditional II, conditional III and zero conditional.

Conditional	If clause	Main clause
I	Present Simple	Will + verb
II	Past Simple	Would + verb
III	Past Perfect	Would have + V3 (ed)
zero	Present Simple	Present Simple

Note that the following contractions are common in speech:
will - *'ll,* e.g. *l'll* **would have**- *would've,* e.g. *we would 've* **would/had** - *'d,* e.g. *they'd*

Uses
We use conditional sentences to talk about the relationship between events and their consequences:

e.g. If we have any errors in the program (event), *it won't work* (consequence).

Conditional I

We use it to talk about a possible future situation and its consequence:

*e.g. If the application **is installed** now, I'**ll have** enough time to check it.*
The teacher won't be *pleased if we'**re** late for class.*

Conditional II

We use it to talk about hypothetical present or future situation and its consequence:

*e.g. If Andrew **spoke** good English, he **would get** a job in this IT company.*
If I were you, I'd bought a new laptop.

Conditional III

We use it to talk about hypothetical situations in the past, i.e. how things could have been different in the past.

*e.g. If I'**d known** you had a problem, I **would have helped** you.*

Zero conditional

We use it to talk about facts that are always true.

*e.g. If you **heat** water to 100 degrees, it **boils**.*

1. Match the sentences halves to form conditionals.

1. If you want to study files from the internet,	a) we'd be able to do all the technical specifications in half the time.
2. If you want to use this software package on more than one system,	b) we'd avoid any mistakes.
3. If we bought a new software package,	c) you'll have to get a site licence
4. If the applications had been released,	d) download them onto the computer.
5. If we ran an additional test,	e) we'd have earned a lot of money.

2. Complete the sentences using the verbs in brackets

Model: I would enter the information faster if my keyboard **worked** properly. (work)

1. You need good security on your computer — thieves … get into your accounts if you don't have proper security. (be able to)
2. Where … you … if you go to university. (live)
3. If I … a programmer, I would have liked to become a musician. (become)
4. If the lift breaks down, … the alarm button. (press)
5. My boss is pleased with my work. If I get a pay rise this month, I … a new car. (buy)
6. If I … you I would use this app. (be)

3. Translate the sentences from English into Russian.

1. If I click "Next" the setup guide will open.
2. If you right-click the icon you'll see the dropdown menu.
3. If you click "Finish Setup" you'll wait for a moment or maybe some moments.
4. If you want to install a program you can read the instructions to be helped.
5. What will you do if you start programs through GUI?
6. What will you do if you have a mathematical error in a program?
7. What would you do if you needed extra people for a project?
8. When a program is completed you will be asked to work on the presentation.
9. If the development of our new program had been right on the schedule we would not have asked for extra help.
10. If every engineer had completed the program we would have done all calculations

on time.

4. Translate the sentences from Russian into English:

1. Если вы сделаете неправильные расчёты, мы не уложимся в срок.
2. Если бы вы учили хорошо математику, у вас бы не было сейчас проблем на работе.
3. Как только вы запустите эту программу, дайте мне знать.
4. Если разделить это число на это, вы получите ответ.
5. Если бы вы знали равенство.
6. Когда вы нажмёте на кнопку «Выбрать», у вас появится поле для заполнения.
7. Если вы введёте свои данные, вы сможете их сохранить.
8. Если вы прочтёте инструкцию, вам все будет понятно и просто.
9. Если вы не сможете запустить программу, зовите на помощь специалиста.
10. Когда решите проблему с запуском, начинайте делать расчёты.

6. The infinitive

Forms

	Active	Passive
Indefinite	**to +verb** My computer isn't easy **to hack.** (Мой компьютер нелегко **взломать.**)	**to be V3(-ed)** I want **to be informed** of adding new application software. (Я хочу **получать информацию** о добавлении нового прикладного программного обеспечения.)

Use the infinitive with to:

1 after adjectives
*e.g. It's **easy to use** this application for creating presentations.*

2 after question words (e.g. who, what, when, where, how, etc.)
*e.g. Now I know **how to install** this app.*

3 to give a reason for doing something
*e.g. I bought a more powerful computer **to install** different programs I need for my job.*

4 after some verbs (e.g. **afford, agree, decide, expect, forget, help, hope, learn, need, offer, plan, pretend, promise, refuse, remember, seem, try, want, would like**)
*e.g. I **would like to become** a programmer in the future.*

Negative infinitive — ***not to + verb***
*e.g. Try **not to break** the printer.*

Use the infinitive without to

1 after most modal verbs
*e.g. I **can install** an operating system.*

2 after *make* and *let*
*e.g. Programs **make computers perform** specific tasks.*
*She didn't **let me finish** my essay.*

1. Complete the gaps with the verbs given below (use 'to' where necessary)

replace   process   perform   start   not touch   connect   explain

1. Are you ready … a new project?
2. I don't know how … it but your computer isn't working again.
3. What can let your computer … faster.
4. I used a new cable … the printer to the computer.
5. No one could … a broken part.
6. The IT specialist told me ….the computer until he comes.
7. He made me … all the data using this program.

2. Make sentences using the prompts.

Model: not easy / write instructions in COBOL.
It isn't easy to write instructions in COBOL.

1. expensive / set up a data processing area.
2. advisable / test the program under different conditions.
3. unusual / write a program that works correctly the first time it's tested.
4. important / use a good debugger to fix errors.
5. easy / learn Pascal.

3. Choose the correct words to complete the sentences.

1. We don't use machine code because it's too complex …, understand and debug.
   a) read   b) reading   c) to read
2. I went on the course … how to become a better programmer.
   a) learn   b) learning   c) for to learn
3. It's really interesting … that computer language.
   a) learn   b) learning   c) to learn
4. He agreed … me with the presentation.
   a) help   b) helping   c) to help
5. The engineers warned the employees not … the cables.
   a) touch   b) touching   c) to touch
6. They should … to the conference.
   a) come   b) coming   c) to come
7. Spyware can make your PC …. more slowly.
   a) perform   b) performing   c) to perform
8. This application is too slow … the data.
   a) process   b) processing   c) to process
9. HTML allows us …. how information will be displayed on web pages.
   a) describe   b) describing   c) to describe

10. Who can let me … access to this site?
    a) get   b) getting   c) to get

4. Translate the following sentences from Russian into English.

7. Мы начали изучать этот язык программирования, чтобы создавать сайты и приложения.
8. Сложно использовать программу, в которой ты работаешь впервые.
9. Машинный код трудно написать.
10. Он просил, чтобы все данные были отправлены как можно скорее.
11. Мне объяснили, как пользоваться этим устройством за пару минут.

7. The Gerund

Forms

	Active	Passive
Indefinite	**V+ing** E.g. **Loading** files from unknown sites can be harmful for your computer. (**Загрузка** файлов с неизвестных сайтов может нанести вред вашему компьютеру)	**being V3(ed)** He installed the spying program without **being noticed.** (Он **незаметно** установил шпионскую программу.)
Perfect	**having V3(-ed)** He mentioned **having used** this application before. (Он упомянул, что уже пользовался этим приложением раньше.)	**having been V3(-ed)** I remember **having been shown** this program. (Я помню, что мне показывали эту программу.)

Use gerund:

1 as the subject or object of a sentence
*e.g. **Uploading** so much information can take some time.*
*The best thing about weekends is **not going** to work.*

2 after preposition
*e.g. I'm thinking **of buying** a new laptop*

3 after some verbs (e.g. admit, avoid, deny, dislike, enjoy, feel like, finish, hate, keep, like, love, mind, miss, practice, prefer, recommend, spend time, stop, suggest)
*e.g. I **don't mind working** every day.*

1. Open the brackets using the *-ing* form.

1. I'm afraid of … your computer as it often breaks. (to use)
2. The best thing about working online is … to work and back. (not to commute)
3. … for this job can be complicated. (to apply)
4. I don't mind … a large salary. (not to earn)
5. I finished … on that project only an hour ago. (to work)

2. Complete the sentences with a verb in the list in the *-ing* form.

to freeze   to make   to test   to upload   to create   to develop   to combine   to edit   to replace   to texture

1. I enjoy … photos.
2. Compositing is … parts of different images.
3. Designers started a project by … a templet.
4. This course involves … different applications.
5. … involves add paint, colour and filters.
6. Computer programming is the process of … and maintaining the source code of computer programs.
7. … can help you to find any possible errors.
8. I gave up … the files as there were damaged.
9. The screen kept … and I couldn't do anything with it.
10. An IT specialist suggested … the old video card to make my computer work faster.

3. Choose the correct option.

1. It's difficult … reliable information these days.
   a) finding   b) to find   c) find
2. John isn't very good at … texts.
   a) editing   b) to edit   c) edit
3. My boss promised … if I don't finish the project in time.
   a) sacking   b) to sack   c) sack
4. I should … this app. It can help me with problem solving.
   a) installing   b) to install   c) install
5. … some games can take ages.
   a) downloading   b) to download   c) download
6. 'My computer' lets you … the files stored on your computer.
   a) browsing   b) to browse   c) browse
7. A GUI allows users … computers without knowing any operating system commands.
   a) using   b) to use   c) use
8. George really enjoys … in a team.
   a) working   b) to work   c) work
9. I used this keyboard shortcut … the window.
   a) closing   b) to close   c) close
10. I go on … the robot so it works well.
   a) setting   b) to set   c) set

8. The Participle

How to form

Participle I V+ing	Participle II V+ed/V3
sitt**ing** - сидящий work**ing** - работающий read**ing** - читающий, читая, прочитав **Knowing** C++ well, he can create different software. (Хорошо **зная** C++, он может создавать различное программное обеспечение.) **Having completed** the project we started to work on our own. (**Завершив проект,** мы начали работать самостоятельно.)	discuss**ed** - обсуждаемый, обсужденный buy - **bought** - покупаемый, купленный A bridge is a hardware and software combination **used** to connect the same type of networks. (Мост - это комбинация аппаратного и программного обеспечения, используемая для соединения сетей одного и того же типа)

When to use

Причастие употребляется и самостоятельно в функциях, сходных с функциями русских причастий и деепричастий

Participle I	Participle II
1) as adjective **e.g:** a writing man	**1) as adjective** **e.g:** a broken device, a finished article
2) **В положении** *после* существительного причастие обычно сопровождается пояснительными словами, образуя причастный оборот	
e.g: The man **replacing** the old equipment is a new IT specialist. (Человек, заменяющий старое оборудование, - это новый ИТ-специалист.)	**e.g:** The class *cancelled last week* will be held next Friday. (Отменённое *на прошлой неделе занятие* состоится в следующую пятницу.)
3) Так же как и в русском языке, причастные обороты не характерны для разговорной речи, но они весьма употребительны в художественной литературе (в описаниях), научной и общественно-политической литературе и деловых документах.	

Определительный причастный оборот является стилистическим способом сократить определительное придаточное предложение.	
e.g: Central processing units (CPU) help quickly process all the data **pouring** in from the app servers. (... process all the data **that pour** in from the app service*) Центральные процессоры (CPU) помогают быстро обрабатывать все данные, **поступающие** с серверов приложений. (... обрабатывать все данные, **которые поступают** с серверов приложений.)	**e.g:** We enclose a list of goods *damaged in transit. (... which were damaged in transit.)* Прилагаем список товаров, повреждённых в пути (... которые были повреждены в пути.)
4) **to replace relative clauses that contain active verbs (**для замены придаточного предложения с глаголом в активном залоге**)** **e.g:** No entry to people **wearing** (= who are wearing) jeans	2) **to replace relative clauses that contain passive verbs (**для замены придаточного предложения с глаголом в пассивном залоге**)** **e.g:** His first book, **called (**= which was called**)** 'No Future without technology', became a hit
5) **to replace a time clause beginning with** *when, after, before, as soon as, while* (чтобы заменить придаточное предложение времени, которые содержат союзы *когда, после того как, прежде чем, как только, в то время как*) **e.g:** When he realised □ **Realising** he had left the documents at work, he asked the taxi driver to turn back.	
6) Причастный оборот в функции обстоятельства причины является стилистическим способом сократить придаточное предложение причины.	

e.g: Knowing the program well, he was an excellent worker. (As he knew the program...)	

1. Choose the correct form.

1. A computer can perform a … list of instructions and react to new instructions.
   a) programmed   b) programming   c) having programmed
2. System software is a type of software …to communicate with the hardware and applications.
   a) designing   b) designed   c) being designed
3. Application software is the type of software ... specific tasks within the operating system.
   a) having accomplished   b)accomplishing   c) accomplished
4. Narrow AI is capable of … only a limited set of predetermined functions.
   a) performing   b) performed   c) having performed
5. AI is currently … to a range of functions both in the lab and in the consumer settings.
   a) being applied   b) applied   c) applying
6. The users do not have much control over the functions … by the RTOS.
   a) performed   b) performing   c) being performed
7. AI is intelligence … by machines.
   a) demonstrated   b) demonstrating   c) having demonstrated
8. … the main problem, the scientist made a report on his research.
   a) Having solved   b) Solving   c) Being solved
9. In England the weight of luggage … varies with different railways.
   a) allowed   b) being allowed   c) allowing
10. The CPU is connected to various peripherals, … input/output devices and additional storage units.
   a) including   b) included   c) having included

2. Choose the closest translation to the text .

1. Programming languages differ **depending** on the field of activity and the operating system of the device for which the program **is being written.**
а) Языки программирования различаются в зависимости от области деятельности и операционной системы устройства для которой программа пишется.
б) Языки программирования различаются в зависимости от области деятельности и операционной системы для которой программа написана.
2. HTML is the standard markup language for documents designed to be displayed in a web browser.
а) HTML — это стандартный язык разметки для документов , разработанных чтобы отображаться в веб-браузере.

б) HTML — это стандартный язык разметки для разработки документов в веб-браузере.

3. Many computer programmers work in the cybersecurity field, helping to identify malicious software and fix software that could be vulnerable to potential hack.

а) Многие программисты работают в сфере кибербезопасности и помогают определять вредоносное ПО и исправлять ПО , которое может быть уязвимо для потенциальных атак.

б) Многие программисты работают в сфере кибербезопасности помогая идентифицировать вредоносное ПО и исправлять ПО, которое могло бы быть уязвимо для будущих атак.

4. Special-purpose computers can perform specific tasks and their operations are limited to the programs built into their microchips.

а) Специализированные компьютеры могут выполнять специальные задачи и их работа ограничена программами , заложенными в них.

б) Специализированные компьютеры могут выполнять специальные задачи и их операции ограничены программами, встроенными в их микрочипы.

5. Digital signatures are a complex and effective answer to the threats posed by cyberattacks.

а) Цифровые подписи это сложный и эффективный ответ на угрозы, вызванные кибератаками.

б) Цифровые подписи это сложный и эффективный ответ на вызываемые кибератаками угрозы.

3. Translate the following sentences from English into Russian paying attention to the participles.

1. When looking for a job you can find vacancies by languages that programmers work with and by the level of experience or position.

2. We want to be sure that our messages can't be intercepted and understood by anyone listening to the message.

3. There are more and more jobs which humans leave to robots such as exploring another planet, defusing bombs, exploring inside a volcano or just doing boring household chores like cleaning.

4. Using industrial robots has led to cheaper production of various goods, including automobiles and electronics.

5. Industrial robots are also used for packaging of manufactured goods, transporting goods around warehouses or hospitals or removing tiny electronic components with great accuracy, speed and reliability.

6. Scientists are interested in designing robots that resemble a human.

7. There are a lot of books and films about people losing control over clever machines which begin to kill their creators.

8. It is still very difficult to answer the question if robots are our best friends or they are dangerous.

9. Even expensive software is too easy to copy.
10. A programmer uses special mathematical models to develop computer

4. Translate the following sentences from Russian into English paying attention to the verbals.

1. Определив алгоритм решения задачи, программист должен выбрать наиболее подходящий язык программирования.
2. Когда его программа уже активно используется, программист может вносить правки, ориентируясь на пожелания или собственные наблюдения.
3. Этот специалист может отвечать за консультирование пользователей программы или клиентов компании, с которой он работает.
4. Языки программирования различаются в зависимости от сферы деятельности и операционной системы устройства, для которого пишется программа.
5. Одна из задач разработчика игр – продумать, как будет развиваться сюжет в игре.
6. При поиске решения с цифровым сертификатом для электронной почты компаниям следует учитывать несколько факторов.
7. Цифровые подписи являются комплексным и эффективным ответом на угрозы, создаваемые кибер атаками.
8. Серфинг в Сети может легко помочь нам найти и открыть нужную нам книгу.
9. Некоторые люди становятся довольно зависимыми от интернета и проводят целые дни в Интернете, на онлайн-свиданиях или за играми.
10. Компьютеры специального назначения могут выполнять определённые задачи, и их операции ограничены программами, встроенными в их микрочипы.

5. Translate the following sentences from English into Russian paying attention to the infinitive, gerund and participle constructions.

1. Do not forget that the employer is likely to be interested in the specialist who have received a higher education.
2. The programmer is required to know special programming languages.
3. Staff who used to exchange confidential information in person have transferred these communications to email, with such unprotected messages posing one of the greatest risks for businesses today.
4. Proper application of computing equipment in different industries is likely to result in proper management, effective distribution of materials and resources, more efficient production and trade.
5. Digital computers are considered to be simple machines.
6. The more switches a computer checks in one cycle, the more data it can recognize at one time and the faster it can operate, each switch being called a binary digit or bit.
7. The global robotics industry is expected to be worth 80 billion USD by 2024.
8. Most future home networks, however, are likely to be wireless network systems,

using tuned transmitter and receiver devices.

9. The question being too difficult, no one could answer it.

10. Not having to worry about upgrading to the last version of your office suite leaves business with more time.

11. Light is recognized to be amplified in the same way as microwaves.

12. Copper being a good conductor, we were asked to use it when carrying on our research work.

13. The new hydro-electric station being put into operation, the surrounding enterprises will be supplied with electric power.

14. It is very rare for an e-commerce business to handle all these elements by itself.

15. Organizations are more likely to migrate mission-critical workloads to public clouds.

Заключение

Целью учебного пособия является формирование у студентов профессиональных компетенций, необходимых для профессионального взаимодействия. Учебное пособие является вспомогательным образовательным инструментом и концентрируется на определённых разделах, связанных с компьютерными технологиями и включает новый, более актуальный материал для освоения дисциплины иностранный язык.

При работе с данным учебным пособием студенты получают знания и навыки использования фонетики, морфологии, синтаксиса, лексики и грамматических правил английского языка для составления корректного устного и письменного высказывания в рамках деловой коммуникации; лексических форм и синтаксических структур, функционирующих в академических текстах и служащих средством коммуникации в ситуациях делового взаимодействия. Студенты смогут овладеть широким словарным запасом для осуществления устной и письменной коммуникации на иностранном языке на академические и профессиональные темы.

Основной фокус учебного пособия направлен на лексику по таким темам как искусственный интеллект, облачные вычисления, защита информации, виды программного обеспечения и т.д. Особое внимание уделено грамматическому материалу, связанному с изучением временных форм английского языка и неличным формам глагола (причастие, герундий, инфинитив) и оборотов с ними.

Надеемся, что приобретённые знания, умения и навыки помогут студентам в освоении будущей специальности и дальнейшей работе.

Список использованных источников

1. English for Engineering Students: Учебное пособие для студентов технических направлений подготовки [Электронный ресурс] / Л. Б. Кадулина [и др.]. — Томск: ТУСУР: 2020. — 296 с. — Режим доступа: https://edu.tusur.ru/publications/9323 (Дата обращения 03.10.2022).

2. Evans, Virginia. Software engineering: in 3 books. - Newbury : Express Publishing , 2019. - 120 p. il. - (Career Paths). - **ISBN** 978-1-4715-1930-7 .