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«Белорусский государственный университет  
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Кафедра иностранных языков №1

**МЕТОДИЧЕСКИЕ УКАЗАНИЯ  
И КОНТРОЛЬНЫЕ ЗАДАНИЯ №5–6  
ПО АНГЛИЙСКОМУ ЯЗЫКУ ДЛЯ СТУДЕНТОВ ФЗО**

**METHODICAL DIRECTIONS AND TESTS №5–6  
IN ENGLISH FOR THE STUDENTS  
OF THE FACULTY OF EXTRAMURAL EDUCATION**

Минск БГУИР 2010

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**Р е ц е н з е н т**

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**Методические указания и контрольные задания №5–6 по английскому**  
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Данная разработка является продолжением «Методических указаний и контрольных заданий №1–4 по английскому языку для студентов факультета заочного, вечернего и дистанционного обучения» и включает контрольные задания №5–6. Содержание контрольных заданий полностью соответствует рабочей программе и позволяет осуществлять поэтапный контроль за самостоятельной работой студентов.

Учебные тексты актуальны, универсальны и могут быть адресованы студентам всех специальностей. Комплекс заданий, сопровождающих тексты, позволяет осуществлять контроль как грамматических, так и лексических навыков чтения.

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## КОНТРОЛЬНОЕ ЗАДАНИЕ №5

При выполнении задания следует обратить внимание на следующие грамматические явления.

### Виды придаточных предложений. Бессоюзное подчинение

В английском языке существуют различные типы придаточных предложений. Тип придаточного предложения определяется по его месту в предложении и вопросу, на который оно отвечает. Рассмотрим некоторые из них.

1. Придаточные дополнительные предложения (Object Clauses) отвечают на вопросы *what?* – что?; *whom?* – кого?; *for what?* – за что? и присоединяются к главному предложению при помощи союзов *that* – что; *whether* – ли; *if* – ли или союзных слов *who* – кто; *whose* – чей; *what* – что, какой; *which* – который; *when* – когда; *where* – где, куда; *how* – как; *why* – почему.

We know *that this method of heat transfer is simply called conducting.* Мы знаем, что этот способ передачи тепла называется просто проводимостью.

He asked *if the current and the voltage in the rotating coil remained alternating.* Он спросил, остаются ли переменными ток и напряжение во вращающейся катушке.

2. Придаточные определительные предложения (Attributive Clauses) отвечают на вопросы *what?* – какой?; *which?* – какой?, который? и вводятся в сложное предложение местоимениями и союзными словами *who* – который; *whose* – чей, которого; *which* – который; *that* – который, которого или наречиями *when* – когда, *where* – где, *how* – как, *why* – почему.

The resistance of a conductor depends on the material *that is used for the conductor.* Сопротивление проводника зависит от материала, который используется для этого проводника.

Lomonosov was one of those rare minds *whose scientific ideas were scores of years ahead of their time.* Ломоносов был одним из тех редких умов, научные идеи которого намного опережали его время.

These waves, *which are commonly called radio waves,* travel with the velocity of light. Эти волны, которые обычно называются радиоволнами, распространяются со скоростью света.

3. Придаточные обстоятельственные предложения (Adverbial Clauses) подразделяются на придаточные места, времени, причины, условия и т. д. Они отвечают на вопросы *where?* – где?, куда?; *from where?* – откуда?; *when?* – когда?; *since when?* – с каких пор?; *why?* – почему?; *what for?* – зачем, для чего?; *for what purpose?* – с какой целью? и вводятся союзами (союзными словами) *where* – где, куда; *wherever* – где бы ни, куда бы ни; *when* – когда; *while* – в то время как; *as* – когда, в то время как, по мере того как; *after* – после того как; *because* – потому что; *since* – так как, поскольку; *for* – так как, ибо; *that, in order that, so that* – чтобы, для того чтобы; *lest* – чтобы не.

We are building new blocks of flats *where there were only some small wooden houses a few years ago.* Мы строим новый жилой массив там, где несколько лет назад было лишь несколько маленьких деревянных домов (придаточное места).

**When radio waves travel away from their point of origin** they become attenuated or weakened.

He looked through his notes very carefully, **as he was going to make a report at a conference**.

**If the temperature is low** the reaction will proceed slowly.

Когда радиоволны отходят от точки их излучения, они затухают или ослабевают (придаточное времени).

Он тщательно просмотрел свои записи, так как собирался делать отчет на конференции (придаточное причины).

Если температура будет низкой, реакция будет проходить медленно (придаточное условия).

Придаточные предложения могут присоединяться к главному бессоюзно:

I think **we will complete our research in time** (Object Clause).

Я думаю, что мы завершим свое исследование вовремя.

The mass of body is defined as the quantity of matter **it contains** (Attributive Clause).

Масса тела определяется как количество материи, которое оно содержит.

### Глаголы *should, would*

1. Глагол *should* употребляется:

а) в качестве вспомогательного глагола:

– для образования глагольных форм Future in the Past в 1-м лице единственного и множественного числа:

He said that **I should rewrite** my essay.

Он сказал, что мне следует переписать сочинение.

– для образования глагольных форм в сослагательном наклонении.

В нереальных условных предложениях ставится в 1-м лице единственного и множественного числа в главном предложении:

**I should give** you some money if you asked me.

Я дал бы тебе немного денег, если бы ты попросил меня.

Во всех остальных случаях сослагательного наклонения *should* ставится в придаточном предложении во всех лицах единственного и множественного числа после союза:

The dean insisted **that you should take** your exams before the 1st of June.

Декан настаивал, чтобы вы сдавали экзамен до 1-го июня.

б) после выражений *it is necessary* – необходимо, *it is better* – лучше:

**It is better** that he **should see** everything with his own eyes.

Будет лучше, если бы он увидел все своими глазами.

в) конструкция *should + Perfect Infinitive* выражает невыполнимое действие в прошлом:

You **should have stopped** at the red lights.

Тебе следовало бы остановиться на красный свет (но ты не остановился).

г) глагол *should* в качестве модального глагола употребляется для выражения обязанности, необходимости, морального долга, совета:

You **shouldn't tell** lies.

Ты не должен лгать.

You **should eat** more fruit and vegetables.

Вам следовало бы есть больше фруктов и овощей.

You **should read** this article.

Вам следует (следовало бы, вы должны) прочесть эту статью.

2. Глагол **would** употребляется:

– в качестве вспомогательного глагола для образования глагольных форм Future in the Past во 2-м и 3-м лицах единственного и множественного числа (вместо глагола will):

He **said** (that) he **would come** next day. Он сказал, что навестит меня на следующий день.

– в качестве модального глагола для выражения намерения, желания:

He **said** he **would lend** me some money to buy a car. Он сказал, что одолжит мне деньги, чтобы купить машину.

– для выражения повторности действия или настойчивости:

He **would wait** for me at the corner of our house. Он обычно ждал меня на углу нашего дома. (Или он (но он) все ждал меня на углу нашего дома.)

### Многофункциональные слова

<b>Since</b>	Так как, поскольку; с (перед любыми словами, указывающими на время); с тех пор как.
<b>As</b>	Так как, поскольку; как, в качестве, по мере того как.
<b>As well as</b>	Так же как.
<b>As to</b>	Что касается.
<b>For</b>	Для, за; в течение; так как.
<b>Because</b>	Так как (в начале фразы); потому что (в середине фразы).
<b>Because of</b>	Из-за, впоследствии.
<b>Due to</b>	Благодаря, из-за, вследствие.
<b>To be due to</b>	Происходить благодаря, обуславливаться.
<b>Both</b>	Оба.
<b>Both ... and</b>	Как ... так и, и ... и.
<b>Either</b>	Любой.
<b>Either ... or</b>	Или ... или.
<b>Neither</b>	Ни один из.
<b>Neither ... nor</b>	Ни ... ни.

### Вариант 1

**1. Перепишите предложения, подчеркнув придаточные предложения. Укажите тип придаточного предложения и переведите их на русский язык.**

For a long time Bell couldn't get the results that he was looking for. Белл не мог долгое время получить результаты, которые он искал (определяющее придаточное предложение).

1. Modern telecommunications networks carry images, television transmissions used in video conferences in which the participants can see as well as hear each other.

2. The bell or another alarm signal operates only when the circuit is broken.

3. Modern telecommunications networks carry images, television transmissions used in video conferences in which the participants can see as well as hear each other.

4. The bell or another alarm signal operates only when the circuit is broken.
5. We know the temperature of the sun is exceedingly high.
6. New improvements promise cables that can transmit of telephone calls over a single fiber.
7. I wanted to know who produced a system that transmitted page-form telegrams.
8. This is a type of reaction you will easily understand.
9. It is said that optical technology is cost effective and versatile.
10. Georg Boole devised a system of formulating logical statements symbolically so that they could be written and proved in a way similar to that of ordinary algebra.

**2. Перепишите предложения, переведите их на русский язык и определите функции *should, would* в предложениях.**

We *should* introduce this method if it were Мы бы ввели этот метод, если бы он был efficient (вспомогательный глагол при эффективном образовании сослагательного наклонения).

A magnet *would* attract pieces of iron Магнит обычно притягивает куски железа. (модальный глагол).

1. He would work on his design for hours.
2. She asked if we should study alloys next year.
3. If you had applied your theoretical knowledge to your practical work, you would have got a different result.
4. It is very important that the current should be measured exactly.
5. The manual says that the computer should be disconnected from the mains before the cover is removed.
6. If they had completed the research, the results would have been discussed at the conference.
7. The results of the experiment should be checked carefully.
8. The researchers said that they would find optimal conditions for the work of the equipment.
9. Academician Yoffe was among the first to notice that transistors would be of great interest for future technology.
10. If this method of work were applied we should succeed in obtaining better results.

**3. Перепишите предложения, обратив внимание на различные значения выделенных слов. Переведите предложения на русский язык.**

This formula is not so simple *as* you think.

Эта формула не такая простая, как вы думаете.

This is *due to* the raise of temperature.

Это происходит из-за повышения температуры.

1. There is no flow of electrons *since* the electric current is broken.
2. Mathematics is an important subject for technical students *because* it is applied to all branches of sciences.
3. The international system of measures and weights is called the metric system *as* it is based on the meter and the kilogramme.

4. Einstein liked questions, answered them at once *for* there were no simple or foolish questions *for* him.

5. *Due to* the Sun people have immense supplies of energy.

6. Electrical signals converted to light signals by a laser-driven transmitter carry *both* speech *and* data over bundles of thin glass or plastic filaments.

7. Artificial magnets may be *either* permanent *or* electromagnet.

**4. Прочтите текст. Постарайтесь понять его содержание. Выполните задания после текста.**

### Secondary Storage Systems

1. Secondary storage devices store data not currently being processed. Unlike the computer's main memory, or primary storage, which is based on sets of silicon chips, the more permanent secondary storage systems are usually based on magnetic disks or magnetic tape. While computers may need only enough main memory capacity to carry out the computer's processing tasks, secondary storage is usually much larger because it is used to store many different types of data and program files for long periods of time.

2. A computer program will usually be stored in secondary storage. When that program is started, key instructions related to that program's functions are transferred from permanent storage to main memory. The program will usually provide a way for the user to load data from secondary storage to be used while the program is in operation and a way to save data back to secondary storage after processing.

3. Since both data and processing instructions can be temporarily stored in the chip-based primary memory system, it is not necessary for secondary storage systems to be as fast as main memory. The constant data transfers between the CPU and main memory take place in a few billionths of a second (nanoseconds). Data transfers to and from secondary storage are more likely to be measured in thousandths of a second (milliseconds), a considerably slower rate of transfer.

4. Although many types of secondary storage have been invented, the most common type of secondary storage system in use today is based on disks that are coated with a magnetized surface. On the magnetic medium that coats these disks, tiny areas can be aligned magnetically in one of two different ways. Using this bipolar system of magnetism, data can be stored on the disk using the binary code. Each area that can be magnetized is known as a bit and the bits are grouped to form bytes. Typically, each byte stores one character, using the same binary coding method used in primary memory.

5. Diskettes (commonly referred to as floppy disks) are a form of portable storage that can be inserted into a computer's diskette drive. Today's diskettes for personal computers vary considerably in their storage capacities. These diskettes may have 40 tracks, 80 tracks, or more. More tracks mean more storage capacity, but it also means that the data on diskettes with differing numbers of tracks cannot be read by disk drives that do not have the capability to read or write that many tracks. This can cause problems when you are using diskettes to transport data from one computer to another.

6. Fixed disks, often referred to as hard disks, use the same magnetic media as diskettes. But while diskettes can be used to carry data from a computer to a computer, fixed disks are internal devices used to store much larger amounts of data inside the computer. Fixed disks often use several magnetically coated disks stacked one on top of the other. All of these disk platters inside the sealed case spin at the same rate, but each disk has its own set of read/write heads. Fixed disks start spinning as soon as the computer is turned on.

**Notes:**

secondary storage devices	внешние запоминающие устройства (ЗУ)
primary storage	основное ЗУ
to coat	покрывать
storage capacity	объем памяти
platter	жесткий диск
transfer, n	перемещение данных из одного места в другое

**5. Укажите, какие из данных утверждений соответствуют содержанию текста.**

1. The capacity of secondary storage devices is much smaller in comparison with the main memory.
2. Secondary storage systems should be as fast as main memory units.
3. Hard disks are used to store larger amounts of data than diskettes.

**6. Выберите правильные ответы на вопросы.**

1. Which of the units is bigger – a bit or a byte?  
(a) a bit;  
(b) a byte.
2. Are floppy disks considered a portable or a fixed form of secondary storage?  
(a) a portable form;  
(b) a fixed form.

**7. Прочтите предложения. Выберите правильный вариант перевода.**

1. The most common type of secondary storage system in use today is based on disks that are coated with a magnetized surface.

(a) Наиболее общий тип внешних запоминающих устройств в использовании сегодня основан на дисках покрытых магнитной поверхностью.

(b) Наиболее распространенный тип внешних запоминающих устройств, используемых сегодня, основан на дисках с намагничивающимся покрытием.

2. One of the forms of secondary storage is diskettes, commonly referred to as floppy disks.

(a) Одной из форм внешних запоминающих устройств являются дискеты, обычно называемые гибкими дисками.

(b) Одной из форм внешних запоминающих устройств являются дискеты, обычно относимые к гибким дискам.

3. Fixed disks start spinning as soon as the computer is turned on.

(a) Фиксированные диски начинают вращаться, как только компьютер поворачивается.

(b) Жесткие диски начинают вращаться, как только включается компьютер.

#### **8. Переведите письменно 1 – 4 абзацы текста.**

### **Вариант 2**

#### **1. Перепишите предложения, подчеркнув придаточные предложения. Укажите тип придаточного предложения и переведите их на русский язык.**

For a long time Bell couldn't get the results that he was looking for. Белл не мог долгое время получить результаты, которые он искал (определяющее придаточное предложение).

1. Since the computer deals with pulses, the input device is a way of converting numbers written on paper into pulses and sending them to the storage.

2. Morse developed the simple operator key which when depressed completed an electric circuit and sent an electric pulse to a distant receiver.

3. The heat a body contains is the kinetic energy of its molecules.

4. They orbit the earth at a speed that allows them to stay above the same place on the earth at all time.

5. He explained that first of all, we should press the button.

6. As the warm air rises, cooler air takes its place.

7. I wonder whose code is still used in some modern teletype machines.

8. We knew he had made an important discovery.

#### **2. Перепишите предложения, переведите их на русский язык и определите функции *should, would* в предложениях.**

We *should* introduce this method if it were efficient (вспомогательный глагол при образовании сослагательного наклонения). Мы бы ввели этот метод, если бы он был эффективным.

A magnet *would* attract pieces of iron (модальный глагол). Магнит обычно притягивает куски железа.

1. We knew that we should finish our work in time.

2. If I knew enough about the machine I should mend it myself.

3. Scientists said that many of devices would evolve into more versatile equipment.

4. The engineer said they would carry out an experiment with the new device.

5. The substance under investigation should be examined both by chemical and physical means.

6. If the student had been more careful during the experiment, he wouldn't have broken the instrument.

7. It is required that the programmer should code the instructions of the program in the appropriate sequence.

8. If I had the time I should help you to solve the problem.
9. You should follow all the important scientific research in your field.
10. I wish you would write down these data.

**3. Перепишите предложения, обратив внимание на различные значения выделенных слов. Переведите предложения на русский язык.**

This formula is not so simple *as* you think.

Эта формула не такая простая, как вы думаете.

This is *due to* the raise of temperature.

Это происходит из-за повышения температуры.

1. Wireless network use *either* infrared *or* radio frequency transmissions to link these mobile computers to networks.

2. In 1921 Einstein got his Nobel Prize not *for* the theory of relativity but *for* a logic explanation of photoelectric effect.

3. At present plastics *as well as* metals are widely used in various branches of industry.

4. *Since* the moon is the nearest body to the Earth, we know more about it than we know about any other planet.

5. *Both* silicon *and* germanium are semiconductors.

6. *Because of* their small size transistors make it possible to produce devices which can not be made with vacuum tubes.

7. *Neither* of the possible ways is simple.

**4. Прочтите текст. Постарайтесь понять его содержание. Выполните задания после текста.**

**Hard Disk**

1. A hard disk drive (HDD, also formerly known as a fixed disk drive) is a device which stores data on rapidly rotating disks with magnetic surfaces.

Hard drives record information by magnetizing a magnetic material in a pattern that represents the data. They read the data back by detecting the magnetization of the material. A typical hard disk drive design consists of a spindle which holds one or more flat circular disks called platters, onto which the data is recorded. The platters are made from a non-magnetic material, usually glass or aluminum, and are coated with a thin layer of magnetic material. Older drives used iron (III) oxide as the magnetic material, but current drives use a cobalt-based alloy.

2. The platters are spun at very high speeds. Information is written to a platter as it rotates past mechanisms called read-and-write heads that fly very close over the magnetic surface. The read-and-write head is used to detect and modify the magnetization of the material immediately under it. There is one head for each magnetic platter surface on the spindle, mounted on a common arm. An actuator arm moves the heads on an arc across the platters as they spin, allowing each head to access almost the entire surface of the platter as it spins.

3. The magnetic surface of each platter is divided into many small sub-micrometer-sized magnetic regions, each of which is used to encode a single binary

unit of information. In today's hard drives each of these magnetic regions is composed of a few hundred magnetic grains. Each magnetic region forms a magnetic dipole which generates a highly localized magnetic field nearby. The write head magnetizes a magnetic region by generating a strong local magnetic field nearby. Early hard drives used the same inductor that was used to read the data as an electromagnet to create this field. Today, thin film heads are most common. With these later technologies, the read and write head are separate mechanisms, but are on the same actuator arm.

4. Hard drives have a mostly sealed enclosure that protects the drive internals from dust, condensation, and other sources of contamination. The hard disk's read-write heads fly on an air bearing which is a cushion of air only nanometers above the disk surface. The disk surface and the drive's internal environment must therefore be kept immaculate to prevent damage from fingerprints, hair, dust, smoke particles and such, given the sub-microscopic gap between the heads and disk.

5. Using rigid platters and sealing the unit allows much tighter tolerances than in a floppy disk. Consequently, hard disks can store much more data than floppy disks and access and transmit it faster. In 2006, a typical workstation hard disk might store between 80 GB and 1Tb of data, rotate at 7,200 to 10,000 revolutions per minute (RPM), and have a sequential media transfer rate of over 50 MB/s. The fastest workstation and server hard drives spin at 15,000 RPM, and can achieve sequential media transfer speeds up to and beyond 80 MB/s.

**Notes:**

to read back	считывать
read-and-write head	головка считывания/записи данных
arm	рычаг
to spin, v (spun, spun)	быстро вращаться
enclosure	корпус
revolution	здесь: оборот

**5. Укажите, какие из данных утверждений соответствуют содержанию текста.**

1. The platters of the hard disk drives rotate at low speeds.
2. HDDs have an ordinary enclosure with several apertures that make the access to the internals free and easy.
3. HDDs are capable of storing much more data than diskettes.

**6. Выберите правильные ответы на вопросы.**

1. Do HDDs store data on the tape or magnetic disks?
  - (a) magnetic disks;
  - (b) magnetic tape.
2. What material is used for platters today?
  - (a) cobalt – based alloy;
  - (b) iron oxide.

**7. Прочтите предложения. Выберите правильный вариант перевода.**

1. Read-and-write heads fly very close over the magnetic surface.

(a) Головки считывания/записи перемещаются над магнитной поверхностью на очень маленьком расстоянии.

(b) Головки считывания/записи летают близко над магнитной поверхностью.

2. The read-and-write head is used to detect and modify the magnetization of the material immediately under it.

(a) Головка считывания/записи используется для обнаружения и изменения магнетизации материала сразу под ней.

(b) Головка считывания-записи используется для нахождения и изменения намагниченности материала непосредственно под ней.

3. Hard disks can store much more data than floppy disks and access and transmit it faster.

(a) Жесткие диски могут хранить намного больше информации по сравнению с гибкими дисками и обеспечивают более быстрый доступ к ней и ее передачу.

(b) Жесткие диски могут хранить намного больше информации чем гибкие диски и имеют доступ и передают ее.

**8. Переведите письменно 2 – 4 абзацы текста.**

**Вариант 3**

**1. Перепишите предложения, подчеркнув придаточные предложения. Укажите тип придаточного предложения и переведите их на русский язык.**

For a long time Bell couldn't get the results that he was looking for. Белл не мог долгое время получить результаты, которые он искал (определяющее придаточное предложение).

1. This is the principle the mercury thermometer is based upon.

2. She announced that she was then going to read out the results.

3. The latest optical disk development is a system which enables computer users to record their own information on a glass or plastic disk.

4. We know there exist the relationship between the input and the output signal.

5. Electric current can only flow when there is a path provided for it.

6. He wanted to see if these substances also gave rise to X-rays.

7. The invention that was barely noticed in 1948 has created the computer age.

8. They should know this theory well, as it is of great importance in modern science.

**2. Перепишите предложения, переведите их на русский язык и определите функции *should, would* в предложениях.**

We *should* introduce this method if it were efficient (вспомогательный глагол при образовании сослагательного наклонения). Мы бы ввели этот метод, если бы он был эффективным.

A magnet **would** attract pieces of iron. Магнит обычно притягивает куски железа.  
(модальный глагол).

1. I thought I should come to the laboratory.
2. «Do you think it's worth repairing this TV set?» – «No, I should buy a new one.»
3. Without the Sun there would be no light, no heat, no energy of any kind.
4. Yesterday I found out that the professor would lecture on the latest developments in computer science.
5. It is important that safety measures should be taken.
6. If she had known how difficult the job was, she wouldn't have taken it.
7. The manager demanded that the work should be performed in time.
8. They said that some telephones would be able to store not only phone numbers but also names and personal information about callers.
9. If many copies were needed then ink-jet printer would have to print each copy individually.
10. We were sure that we should be able to overcome all the difficulties in our research.

**3. Перепишите предложения, обратив внимание на различные значения выделенных слов. Переведите предложения на русский язык.**

This formula is not so simple **as** you think.

Эта формула не такая простая, как вы думаете.

This is **due to** the raise of temperature.

Это происходит из-за повышения температуры.

1. The applications of laser in industry and science are so many and so varied **as** to suggest magic.
2. **Because** the tube uses free electrons only and has no mechanical moving parts, it responds within a few microseconds to any change placed upon it.
3. Electronic circuits switch telephone calls **both** on Earth **and** in communications satellites.
4. How long **since** Popov invented radio?
5. The device **due to** professor Smiss is of great interest.
6. **Neither** of these methods can be used in that case.
7. Telephone is a device **for** reproducing sounds over considerable distances.

**4. Прочтите текст. Постарайтесь понять его содержание. Выполните задания после текста.**

**The Things to Know About Hard Disks**

1. The hard disk's spindle system relies on air pressure inside the drive to support the heads at their proper flying height while the disk is in motion. A hard disk drive requires a certain range of air pressures in order to operate properly. The connection to the external environment and pressure occur through a small hole in the enclosure (about 1/2 mm in diameter), usually with a carbon filter on the inside. If the air pressure is too low, there will not be enough lift for the flying head, the head will not be at the proper height, and there is a risk of head crashes and data loss. Modern

drives include temperature sensors and adjust their operation to the operating environment.

2. Very high humidity for extended periods can cause accelerated wear of the drive's heads and disks by corrosion. If the drive uses «Contact Start/Stop» (CSS) technology to park its heads on the disk when not operating, increased humidity can also lead to increased sticking (the tendency for the heads to stick to the disk surface). This can cause physical damage to the disk and spindle motor and can also lead to head crash.

3. Due to the extremely close spacing between the heads and the disk surface, any contamination of the read-write heads or disk platters can lead to a head crash – a failure of the disk in which the head scrapes across the platter surface, often grinding away the thin magnetic film. For giant magneto-resistive (GMR) heads in particular, a minor head crash from contamination (that does not remove the magnetic surface of the disk) will still result in the head temporary overheating, due to friction with the disk surface, and can render the data unreadable for a short period until the head temperature stabilizes. Head crashes can be caused by electronic failure, a sudden power failure, physical shock, wear and tear, corrosion, or poorly manufactured disks and heads. In most desktop and server drives, when powering down, the heads are moved to a landing zone, an area of the disk usually near its inner diameter, where no data is stored. This area is called the CSS (Contact Start/Stop) zone. However, especially in old models, sudden power interruptions or a power supply failure can sometimes result in the drive shutting down with the heads in the data zone, which increases the risk of data loss. In fact, it used to be procedure to «park» the hard drive before shutting down your computer. Newer drives are designed such that either a spring (at first) and then rotational inertia in the platters is used to safely park the heads in the case of unexpected power loss.

4. The hard disk's electronics control the movement of the actuator and the rotation of the disk, and perform reads and writes on demand from the disk controller. Modern drive firmware is capable of scheduling reads and writes efficiently on the disk surfaces and remapping sectors of the disk which have failed. Also, most major hard drive and motherboard vendors now support self-monitoring, analysis, and reporting technology (SMART), by which impending failures can be predicted, allowing the user to be alerted to prevent data loss.

**Notes:**

enclosure	корпус
sticking	прилипание
read-write head	головка считывания/записи данных
platter	один из магнитных дисков в дисковом пакете (их может быть до 11)
firmware	встроенное ПО, записанное в ПЗУ/ППЗУ ПО
self-monitoring, analysis, and reporting technology (SMART)	технология самоконтроля и составления диагностических отчетов, технология SMART

**5. Укажите, какие из данных утверждений соответствуют содержанию текста.**

1. Low pressure in the HD enclosure can increase the risk of head crashes and data loss.
2. Very high humidity can prevent the drive's heads and disks from corrosion.
3. Increased sticking of the head to the disk surface can lead to the damage of the disk and spindle motor.

**6. Выберите правильные ответы на вопросы.**

1. Is the distance between the head and disk surface large or small?
  - (a) large;
  - (b) extremely small.
2. Is the head landing zone situated near its outer or inner diameter?
  - (a) near to its outer diameter;
  - (b) near to its inner diameter.

**7. Прочтите предложения. Выберите правильный вариант перевода.**

1. Very high humidity for extended periods can cause accelerated wear of the drive's heads and disks by corrosion.

(a) Очень высокая влажность в течение продолжительного периода времени может привести к ускоренному износу головок и дисков по причине их коррозии.

(b) Очень высокая влажность на расширенные периоды может вызвать ускоренный износ головок и дисков коррозией.

2. Temporary overheating of the head due to friction with the disk surface can render the data unreadable for a short period until the head temperature stabilizes.

(a) Временный перегрев головки по причине трения с поверхностью диска может передавать данные, нечитаемыми в течение короткого периода времени, до тех пор, пока температура головки не стабилизируется.

(b) Временный перегрев головки по причине трения с поверхностью диска может привести к тому, что какие-то данные не будут считываться до тех пор, пока температура не стабилизируется.

3. In fact, in old models there used to be procedure to «park» the hard drive before shutting down your computer.

а) Действительно, в старых моделях существовала процедура для остановки диска до того, как выключался компьютер.

б) Действительно, в старых моделях использовали процедуру для остановки диска до отключения компьютера.

**8. Переведите письменно 2 – 3 абзацы текста.**

## Вариант 4

### 1. Перепишите предложения, подчеркнув придаточные предложения. Укажите тип придаточного предложения и переведите их на русский язык.

For a long time Bell couldn't get the results that he was looking for. Белл не мог долгое время получить результаты, которые он искал (определятельное придаточное предложение).

1. I wanted to know what significant developments are used in telegraphy nowadays.

2. Clearly identify the users' needs lest your software cause confusion while running it.

3. We hope we'll buy the computer your friend spoke so much about.

4. Computers are products of science and technology that are, in turn, having an enormous impact on science and technology.

5. Many electrical engineers and scientists believe that the ultimate limits of size in these circuits might soon be reached.

6. One of the problems Kurchatov worked at was the problem of mastering controlled thermonuclear reactions.

7. The transistor is a semiconductor triode possessing characteristics which are similar to those of thermionic triodes.

8. If the temperature is low, the reaction will proceed slowly.

### 2. Перепишите предложения, переведите их на русский язык и определите функции *should, would* в предложениях.

We *should* introduce this method if it were efficient (вспомогательный глагол при образовании сослагательного наклонения). Мы бы ввели этот метод, если бы он был эффективным.

A magnet *would* attract pieces of iron (модальный глагол). Магнит обычно притягивает куски железа.

1. He said that I should mention my work.

2. Without radio electronics there would be no cybernetics, cosmonautics and nuclear physics.

3. Write down the algorithm of computer operations lest you should make errors.

4. If we placed a small bulb in a complete circuit, it would light up.

5. A Winchester would provide faster access to large amounts of information.

6. If he had not used this formula, he would not have made this mistake.

7. To have got a better mark, you should have checked your answer more thoroughly.

8. He reported that future modifications and technology innovations would be able to blur the distinctions between appliances.

9. Before beginning the experiment one should carefully read all the instructions.

10. It is necessary that the data received should be highly accurate.

**3. Перепишите предложения, обратив внимание на различные значения выделенных слов. Переведите предложения на русский язык.**

This formula is not so simple *as* you think.

Эта формула не такая простая, как вы думаете.

This is *due to* the raise of temperature.

Это происходит из-за повышения температуры.

1. *Due to* reduced size and weight microelectronics may be used to increase the speed of the equipment.

2. *Because* the digital pulses can be regenerated perfectly no noise or other degradation is apparent at the receiving end.

3. He was working at that design *for* two days.

4. Potential is really *neither* a force *nor* a pressure.

5. There are two kinds of transformation which are known *as* physical and chemical changes.

6. Transistors are very sensitive *both* to the action of light *and* to that of nuclear particles.

7. *Since* mineral deposits on the earth are not unlimited it is possible that future man will use mineral deposits on the moon.

**4. Прочтите текст. Постарайтесь понять его содержание. Выполните задания после текста.**

### Computer Viruses

1. A computer virus is a self-replicating computer program written to alter the way a computer operates, without the permission or knowledge of the user. Though the term is commonly used to refer to a range of malware, a true virus must replicate itself, and must execute itself. The latter criteria are often met by a virus which replaces existing executable files with a virus-infected copy. While viruses can be intentionally destructive-destroying data, for example – some viruses are benign or merely annoying.

2. A computer virus behaves in a way similar to a biological virus, which spreads by inserting itself into living cells. It will pass from one computer to another like a real life biological virus passes from person to person. For example, it is estimated by experts that the Mydoom worm infected a quarter-million computers in a single day in January 2004.

Unlike biological viruses, computer viruses do not simply evolve by themselves. Computer viruses do not come into existence spontaneously, nor are they likely to be created by bugs in regular programs. They are deliberately created by programmers, or by people who use virus creation software. Computer viruses can only do what the programmers have programmed them to do.

3. Virus writers can have various reasons for creating and spreading malware. Viruses have been written as research projects, pranks, vandalism, to attack the products of specific companies, to distribute political messages etc. Some virus writers consider their creations to be works of art, and see virus writing as a creative hobby. Additionally, many virus writers oppose deliberately destructive payload

routines. Some viruses were intended as «good viruses». They spread improvements to the programs they infect, or delete other viruses. These viruses are, however, quite rare, still consume system resources, may accidentally damage systems they infect, and, on occasion, have become infected and acted as vectors for malicious viruses. A poorly written «good virus» can also inadvertently become a virus in and of itself (for example, such a «good virus» may misidentify its target file and delete an innocent system file by mistake). Moreover, they normally operate without asking for the permission of the computer owner. Since self-replicating code causes many complications, it is questionable if a well-intentioned virus can ever solve a problem in a way that is superior to a regular program that does not replicate itself.

4. Releasing computer viruses (as well as worms) is a crime in most jurisdictions. Some viruses are programmed to damage the computer by damaging programs, deleting files, or reformatting the hard disk. Others are not designed to do any damage, but simply replicate themselves and make their presence known by presenting text, video, or audio messages. Even these benign viruses can create problems for the computer user. They typically take up computer memory used by legitimate programs. As a result, they often cause erratic behavior and can result in system crashes. In addition, many viruses are bug-ridden, and these bugs may lead to system crashes and data loss.

**Notes:**

malware	проблемы в работе оборудования
executable file	исполнимый (исполняемый) файл, файл с программой или командный файл
to evolve	развиваться
payload	полезная нагрузка
malicious	злонамеренный
target file	файл-мишень

**5. Укажите, какие из данных утверждений соответствуют содержанию текста.**

1. Some viruses can be highly destructive.
2. In its behavior, computer viruses are quite different from biological viruses.
3. In most countries, releasing computer viruses is considered to be a crime.

**6. Выберите правильные ответы на вопросы.**

1. Do computer viruses appear spontaneously or they are created by virus writers?
  - (a) they are created by virus writers;
  - (b) they appear spontaneously.
2. Do computer viruses usually operate with or without asking for the permission of a computer user?
  - (a) without asking;
  - (b) with permission.

**7. Прочтите предложения. Выберите правильный вариант перевода.**

1. Some virus writers consider their creations to be works of art.

(a) Некоторые авторы вирусов считают их создания произведениями искусства.

(b) Некоторые авторы вирусов считают их создания работами искусства.

2. A poorly written «good virus» can also inadvertently become a virus in and of itself.

(a) Бедно написанный «хороший вирус» может непреднамеренно стать вирусом сам из себя.

(b) Плохо написанный «хороший вирус» может стать вирусом сам по себе.

3. Some viruses are not designed to do any damage, but simply replicate themselves and make their presence known by presenting text, video, or audio messages.

(a) Некоторые вирусы не ставят цель нанести вред, а лишь воспроизводят себя, дают о себе знать в виде появляющегося текста, изображения или звукового сообщения.

(b) Некоторые вирусы не предназначены для нанесения вреда, а лишь воспроизводят себя и делают их присутствие, представляя текст, изображение или звуковые сообщения.

**8. Переведите письменно 3 – 4 абзацы текста.**

**Вариант 5**

**1. Перепишите предложения, подчеркнув придаточные предложения. Укажите тип придаточного предложения и переведите их на русский язык.**

For a long time Bell couldn't get the results that he was looking for. Белл не мог долгое время получить результаты, которые он искал (определяющее придаточное предложение).

1. A transformer cannot be called a machine for it has no moving parts.

2. It can be said that the world is in the midst of an electronic revolution.

3. A substrate may be active, when parts of it display transistance.

4. Einstein gave an entirely new idea of the world we live in.

5. Microprocessors, which are at the heart of millions of personal and home computers, pack the same computing power into a tiny chip.

6. It is difficult to establish whether this problem can be solved at all.

7. The laboratory assistant said he would demonstrate a linear amplifier.

8. Fiber-optic cables are cables made of specially treated glass that can transmit signals in the form of pulsed beams of laser light.

**2. Перепишите предложения, переведите их на русский язык и определите функции *should, would* в предложениях.**

We *should* introduce this method if it were Мы бы ввели этот метод, если бы он был efficient (вспомогательный глагол при эффективном образовании сослагательного наклонения).

A magnet *would* attract pieces of iron Магнит обычно притягивает куски железа. (модальный глагол).

1. The director asked when the materials of our research would be typed.
2. It is important that the current should be measured exactly.
3. The results of the experiments should be checked up very carefully.
4. He said that the new transistor would weight about 100 grams.
5. They suggest that he should begin the test immediately.
6. Without computers the development of atomic power stations would be quite impossible.
7. The results were completely wrong. As a scientist she should have planned the experiment more carefully.
8. The system boot would not stop for a disk error.
9. If one knew the dimensions of the body, he would easily calculate its volume.
10. He said that I should do that work myself.

**3. Перепишите предложения, обратив внимание на различные значения выделенных слов. Переведите предложения на русский язык.**

This formula is not so simple *as* you think. Эта формула не такая простая, как вы думаете.

This is *due to* the raise of temperature. Это происходит из-за повышения температуры.

1. Radio communications systems include radio navigation and *both* amateur *and* commercial broadcasting.
2. The experiment was stopped *due to* the lack of data.
3. The system can be considered *either* true *or* false.
4. *Since* his childhood Faraday took great interest in electricity.
5. That area has *neither* fuel *nor* hydropower resources.
6. People realized that electricity could pass through the air *as well as* along the wire.
7. An ammeter is an instrument *for* measuring current.

**4. Прочтите текст. Постарайтесь понять его содержание. Выполните задания после текста.**

**Methods to Avoid Detection**

1. In order to avoid detection by users, some viruses employ different kinds of deception. Some old viruses, especially on the MS-DOS platform, make sure that the «last modified» date of a host file stays the same when the file is infected by the virus. This approach does not fool anti-virus software, however.

Some viruses, called cavity viruses, can infect files without increasing their sizes or damaging the files. They accomplish this by overwriting unused areas of executable files.

Some viruses try to avoid detection by killing the tasks associated with antivirus software before it can detect them.

2. As computers and operating systems grow larger and more complex, old hiding techniques need to be updated or replaced.

3. A virus needs to infect hosts in order to spread further. In some cases, it might be a bad idea to infect a host program. For example, many anti-virus programs perform an integrity check of their own code. Infecting such programs will therefore increase the likelihood that the virus is detected. For this reason, some viruses are programmed not to infect programs that are known to be part of anti-virus software. Another type of hosts that viruses sometimes avoid is bait files. Bait files (or goat files) are files that are specially created by anti-virus software, or by anti-virus professionals themselves, to be infected by a virus. These files can be created for various reasons, all of which are related to the detection of the virus.

4. Anti-virus professionals can use bait files to take a sample of a virus (i.e. a copy of a program file that is infected by the virus). It is more practical to store and exchange a small, infected bait file, than to exchange a large application program that has been infected by the virus.

Anti-virus professionals can use bait files to study the behavior of a virus and evaluate detection methods. This is especially useful when the virus is polymorphic. In this case, the virus can be made to infect a large number of bait files. The infected files can be used to test whether a virus scanner detects all versions of the virus.

Some anti-virus software employs bait files that are accessed regularly. When these files are modified, the anti-virus software warns the user that a virus is probably active on the system.

Since bait files are used to detect the virus, or to make detection possible, a virus can benefit from not infecting them. Viruses typically do this by avoiding suspicious programs, such as small program files or programs that contain certain patterns of «garbage instructions».

A related strategy to make baiting difficult is sparse infection. Sometimes, sparse infectors do not infect a host file that would be a suitable candidate for infection in other circumstances. For example, a virus can decide on a random basis whether to infect a file or not, or a virus can only infect host files on particular days of the week.

Some viruses try to trick anti-virus software by intercepting its requests to the operating system. A virus can hide itself by intercepting the anti-virus software's request to read the file and passing the request to the virus, instead of the OS. The virus can then return an uninfected version of the file to the anti-virus software, so that it seems that the file is «clean».

**Notes:**

host	хост общий термин, описывающий нечто, содержащее ресурс и предоставляющее к нему доступ
executable file	исполнимый (исполняемый) файл, файл с программой или командный файл
likelihood	вероятность
bait (goat) file	файл-приманка

**5. Укажите, какие из данных утверждений соответствуют содержанию текста.**

1. Cavity viruses, can infect files by overwriting unused areas of executable files.
2. With the development of computers and operating systems the techniques of hiding viruses are also updated.
3. Viruses spread without infecting hosts.

**6. Выберите правильные ответы на вопросы.**

1. How do we call the files specially created by professionals for detection of viruses?
  - (a) bait files;
  - (b) hosts.
2. Does the infection of host programmes and particularly of antivirus software increase or decrease the possibility of virus detection?
  - (a) increase;
  - (b) decrease.

**7. Прочтите предложения. Выберите правильный вариант перевода.**

1. As computers and operating systems grow larger and more complex, old hiding techniques need to be updated or replaced.

(a) С увеличением компьютеров и сложности оперативных систем старые способы маскировки требуют обновления и замены.

(b) Так как возможности и сложность компьютеров и ОС постоянно увеличиваются, старые способы маскировки требуют обновления и замены.

2. In this case, the virus can be made to infect a large number of bait files.

(a) В этом случае может быть создан вирус, чтобы заражать большое число файлов-приманок.

(b) В этом случае можно сделать так, чтобы вирус заражал большое число файлов-приманок.

3. A related strategy to make baiting difficult is sparse infection.

(a) Соответствующей стратегией для затруднения обнаружения вирусов файлами-приманками является заражение вразброс.

(b) Связанной стратегией сделать обнаружение вирусов трудным является разбросанное заражение.

**8. Переведите письменно 4-й абзац текста.**

## КОНТРОЛЬНОЕ ЗАДАНИЕ №6

Для того чтобы выполнить задание, необходимо освоить следующие разделы по грамматике.

### Неличные формы глагола: инфинитив, причастие, герундий

Выполнив контрольное задание №5, вы повторили грамматический материал относительно форм, функций, присущих таким неличным формам глагола, как инфинитив, причастие, герундий и оборотам, в состав которых они могут входить. Просмотрите еще раз проработанный материал и обратите внимание на способы перевода неличных форм глагола в зависимости от их формы и функции в предложении.

### Местоимения – заместители существительных: **that (those), this (these), one (ones)**

Вы должны помнить, что в английском научном тексте часто встречаются служебные слова, которые используются вместо слов, уже упомянутых в данном или предыдущем предложении/предложениях. Существуют слова-заменители как для существительных, так и для глаголов-сказуемых. При переводе предложений с такими словами-заместителями обычно рекомендуется повторить замененное слово.

Кроме личных местоимений в именительном и объектном падежах в роли слов-заместителей существительных могут использоваться и другие слова:

1) **that, those** служат для замены существительных, которые имеют правое определение, выраженное или существительным с предлогом (чаще всего *of*), или причастием (чаще всего *Participle II*), или прилагательным. При переводе обычно повторяется ранее упомянутое слово, например:

The most extensive investigation was *that of* Lehman. Наиболее обширным исследованием было исследование Леман.

We use the method similar in *form to those* derived in (4). Мы используем метод, по форме схожий с методами, изложенными в работе (4).

Итак, служебные слова **that** и **those** могут выступать в двух функциях: указательных местоимений и слов-заместителей. Поэтому при переводе предложений, в состав которых входят эти слова, следует помнить, что:

а) если **that** и **those** стоят непосредственно перед существительным, они являются указательными местоимениями со значениями *тот, та, то* и *те* соответственно;

б) если после **that** и **those** стоит предлог, причастие или прилагательное, это значит, что они выполняют роль слов-заместителей упомянутых ранее существительных, поэтому при переводе эти существительные следует повторить, сравните:

The point of view of *that mathematician* was contradictory. Точка зрения *того математика* была противоречивой.

*Those devices* are more reliable in use. *Те приборы* более надежны в использовании.

### Но:

This point of view is *that of* a mathematician rather than a physicist.

Эта точка зрения является точкой зрения математика, а не физика.

These devices are more reliable than *those* designed in our laboratory.

Эти приборы надежнее, чем приборы, разработанные нашей лабораторией.

2) **this, these** обычно используются в качестве подлежащего, поэтому за ними идет глагол, а не существительное, как в том случае, когда **this** и **these** являются указательными местоимениями. Эти слова заменяют существительные предшествующего предложения или предложений. При переводе следует помнить, что:

а) слова-заместители **this** и **these** сохраняют свое значение указательных местоимений: *этом, эта, это* и *эти* соответственно;

б) если **this** и **these** заменяют нераспространенные члены предыдущего предложения или предложений, то их можно повторить, определив указательными местоимениями, например:

The original problem is now broken up into three regions. *These* are loss free regions.

Теперь исходная задача разбивается на три области. *Эти области* являются свободными от потерь.

*These* are the same as the results obtained when  $d = 0$ .

*Эти результаты* являются такими же, какие были получены, когда  $d = 0$ .

в) если **this** и **these** являются заместителями понятий, детально изложенных в предыдущем предложении или предложениях, то в этих случаях рекомендуется использовать служебные слова типа *это, все это, все они, все эти явления* и т. п., например:

*These* were some successive actions.

*Они* представляли собой несколько последовательных действий.

*This* confirms our earlier suggestion.

*Это (явление, открытие)* подтверждает наше раннее предположение.

3) **one, ones** могут заменять существительное, которое имеет определение (обычно стоящее перед этим существительным, чаще всего прилагательное). Если заменяется существительное во множественном числе, тогда используется форма **ones**, например:

It is possible to relate this phenomenological phase diagram to a more conventional *one*.

Можно связать эту феноменологическую фазовую диаграмму с более обычной *диаграммой*.

Among the disadvantages the following *ones* can be mentioned.

Среди недостатков можно упомянуть следующие *недостатки*.

4) **mine, ours, his, hers, theirs, yours** – особая форма притяжательных местоимений, которая заменяет сочетания существительного с притяжательным местоимением, например:

Our procedure is more practical than *theirs* (their procedure).

Наш метод (процедура) более практичен, чем *их метод*.

Results similar to *ours* (our results) have previously been obtained by N.

Результаты, подобные *нашим результатам*, были уже получены раньше.

## Усилительные конструкции *It is (was) ... that, do* в функции усилительного глагола

Прорабатывая раздел по усилительным конструкциям, обратите внимание на то что:

1. В усилительно-выделительной конструкции *it is... that* помимо *that* используются *which, who, when*. В данном случае для выделения любого члена предложения (кроме сказуемого) используются дополнительные элементы *it is* и *that*, которые как бы обрамляют выделяемое слово (данную конструкцию иногда называют «рамочной»). Первый элемент ее – *it is* – стоит в начале предложения, а второй – *that, who, which* – может находиться далеко от первого (если выделяемый член предложения имеет определения, иногда даже выраженные придаточными предложениями); что затрудняет обнаружение конструкции.

Можно предложить два способа перевода предложений с такой конструкцией:

а) найти второй элемент и всю конструкцию (все три служебных слова) заменить словами типа *именно, только, это, как раз* и продолжить перевод, сохранив порядок слов английского предложения, например:

*It is this last category that is of interest to us.* Именно эта последняя категория представляет для нас интерес.

*It was not until 1995 that he published his book.* И только в 1995 году он опубликовал свою книгу.

*It was he who informed us about the results of their work.* Это он сообщил нам о результатах их работы.

*Примечание.* Иногда в самом английском предложении кроме усилительной конструкции дается усиливающее слово, что при переводе избавляет нас от поиска подходящего слова, например:

*It is precisely this method that he followed.* Как раз этот метод он и использовал.

*It was not only this value that counted.* Не только эта величина имела значение.

б) выделяемое слово или группа слов выносятся в конец предложения (без использования дополнительных лексических элементов), так как в русском предложении смысловая нагрузка падает на конец предложения, например:

*It was Pr. N. who was elected chairman of the session.* Председателем собрания был избран профессор Н.

*Примечание.* Следует помнить, что структура *it N ... that* представляет собой усилительную конструкцию только в том случае, если между этими двумя элементами имеется имя существительное. Если же между ними стоит прилагательное, то в этом случае есть безличная конструкция с формальным подлежащим *it*. Сравните:

*It is this question that we are interested in.* Именно этот вопрос интересует нас (усилительная конструкция).

**Но:**

*It is possible that the problem will be solved.* Возможно, что эта проблема будет решена (безличная конструкция).

2. Усилительный глагол *do*. Служебное слово – глагол *do* – используется в утвердительном предложении для усиления значения сказуемого. В этом случае *do* стоит непосредственно перед смысловым глаголом в форме инфинитива без частицы *to* и указывает на время, которое при переводе на русский язык переносится на смысловой глагол, сам глагол *do* не переводится.

Для передачи усиления в русском переводе можно использовать слова *действительно, все же, наконец* и т. п., например:

The value *does seem* high in the light of his observation. В свете этого наблюдения данное значение *действительно кажется* высоким.

It *did cause* some difficulties. Это *все же вызвало* некоторые трудности.

## Вариант 1

**1. Переведите следующие предложения на русский язык, обратив внимание на неличные формы глагола.**

1. A new operator lacks the experience required for practical action.
2. Algol is a system being developed and intended to become a universal programming language.
3. The scientists were provided with all necessary information to make their decision on this problem.
4. The device known to be built by Charles Babbage is now considered to be the parent of modern computers.
5. We were all for starting the experiment at once.

**2. Переведите следующие предложения, обратив внимание на местоимения-заменители существительных.**

1. Whereas the older integrated circuits contained hundreds of transistors, the new ones contain thousands or tens of thousands.
2. Digital recording is almost free of signals. This applies fully to both video and audio signals.
3. The results of this experiment differ greatly from those received in the previous one.
4. His amplifier is cheaper and smaller than mine.

**3. Переведите следующие предложения, обратив внимание на усилительные конструкции.**

1. The pressure didn't change nor did the temperature.
2. It is the discovery of thermoelectronic emission that gave the beginning to the development of vacuum tubes.
3. Only in these conditions does the process becomes stable.
4. It is the computer aided tomography that helps to diagnose many diseases without making operations.
5. It was Ohm who discovered the law of electrical resistance.

**4. Прочтите текст. Постарайтесь понять его содержание. Выполните задания после текста.**

**Semiconductor device fundamentals**

1. The main reason semiconductor materials are so useful is that the behaviour of a semiconductor can be easily manipulated by the addition of impurities, known as doping. Semiconductor conductivity can be controlled by introduction of an electric field, by exposure to light, and even pressure and heat; thus, semiconductors can make excellent sensors. Current conduction in a semiconductor occurs via mobile or «free» electrons and holes (collectively known as charge carriers). Doping a semiconductor such as silicon with a small amount of impurity atoms, such as phosphorus or boron, greatly increases the number of free electrons or holes within the semiconductor. When a doped semiconductor contains excess holes it is called «p-type», and when it contains excess free electrons it is known as «n-type». The semiconductor material used in devices is doped under highly controlled conditions in a fabrication facility, or fab, to precisely control the location and concentration of p- and n-type dopants. The junctions which form where n-type and p-type semiconductors join together are called p-n junctions.

2. The simplest device made from a p-n junction is the p-n junction diode. At the junction of a p-type and an n-type semiconductor there forms a region called the depletion zone which blocks current conduction from the n-type region to the p-type region, but allows current to conduct from the p-type region to the n-type region. Thus, when the device is forward biased, with the p-side at higher electric potential, the diode conducts current easily; but the current is very small when the diode is reverse biased.

3. Exposing a semiconductor to light can generate electron–hole pairs, which increases the number of free carriers and its conductivity. Diodes optimized to take advantage of this phenomenon are known as photodiodes. Compound semiconductor diodes can also be used to generate light, as in light-emitting diodes and laser diodes.

4. Bipolar junction transistors are formed from two p-n junctions, in either n-p-n or p-n-p configuration. The middle, or *base*, region between the junctions is typically very narrow. The other regions, and their associated terminals, are known as the emitter and the collector. A small current injected through the junction between the base and the emitter changes the properties of the base-collector junction so that it can conduct current even though it is reverse biased. This creates a much larger current between the collector and emitter, controlled by the base-emitter current.

5. Another type of transistor, the field effect transistor operates on the principle that semiconductor conductivity can be increased or decreased by the presence of an electric field. An electric field can increase the number of free electrons and holes in a semiconductor, thereby changing its conductivity. The field may be applied by a reverse-biased p-n junction, forming a junction field effect transistor, or JFET; or by an electrode isolated from the bulk material by an oxide layer, forming a metal-oxide-semiconductor field effect transistor, or MOSFET. The MOSFET is the most used semiconductor device today.

**Notes:**

impurity	примесь
to dope	вводить примесь
dopant	примесь
junction diode	плоскостной диод
bias	смещение
to be forward/reverse biased	иметь прямое/обратное смещение
junction field effect transistor (JFET)	канальный полевой транзистор с р-п-переходом
metal-oxide-semiconductor field-effect transistor (MOSFET)	канальный полевой униполярный МОП-транзистор

**5. Укажите, какие из данных утверждений соответствуют содержанию текста.**

1. The removal of impurities from a semiconductor is called doping.
2. The performance of a semiconductor can be influenced by doping.
3. Junction diodes conduct current easily when they are forward biased.

**6. Выберите правильные ответы на вопросы.**

1. How do we call semiconductors with excess holes?  
(a) p-type semiconductors;  
(b) n-type semiconductors.
2. What does a small current base-emitter current injection cause in a junction transistor?  
(a) an increase of collector-emitter current;  
(b) decrease of collector-emitter current.

**7. Прочтите предложения. Выберите правильный вариант перевода.**

1. At the junction of a p-type and an n-type semiconductor there forms a region called the depletion zone.

(a) На стыке полупроводников р- и п-типов формируется область, называемая зоной истощения.

(b) Там, на стыке р- и п-полупроводников, образуется область, называемая зоной уменьшения.

2. Exposing a semiconductor to light can generate electron-hole pairs, which increases the number of free carriers and its conductivity.

(a) Воздействие света на полупроводник может приводить к образованию электронно-дырочных пар, что увеличивает количество свободных носителей тока в полупроводнике и его проводимость.

(b) Подвергнув полупроводник свету, можно генерировать электронно-дырочные пары, которые увеличивают количество свободных носителей и его проводимость.

3. When the diode is reverse biased the current is very small.

(a) Когда диод наклонен обратно, ток мал.

(b) При обратном смещении диода ток мал.

**8. Переведите на русский язык 1 – 3 абзацы текста.**

## Вариант 2

**1. Переведите следующие предложения на русский язык, обратив внимание на неличные формы глагола.**

1. Nearly all the assembly line problems as documented in the literature were solved by this method.

2. Using the energy of the atom we produce electric energy at atomic plants.

3. It is important to know the basic principle to be observed in the design and use of optical equipment.

4. Scientists are looking for new ways for the improvement of integrated circuits technology.

5. Having modified the device architecture he succeeded in getting higher performance at lower power consumption.

**2. Переведите следующие предложения, обратив внимание на местоимения-заменители существительных.**

1. The masers can operate at other frequencies than those used in the microwave region.

2. No connection is possible other than that indicated in the service manual.

3. The other methods are not as efficient as this one.

4. With lasers, all the light waves have the same length and this increases the intensity.

5. If you'd like to repair your radio, you can take my transistor, not his.

**3. Переведите следующие предложения, обратив внимание на усилительные конструкции.**

1. Experiments showed that the starting products did contain impurities.

2. It is not the existence of an adding machine that is of importance in a business system.

3. This type of integrated circuits does make the chip much more effective.

4. It was in Leningrad where Kurchatov began his work.

5. It was Einstein who provided a new conception of time, space and gravitation.

**4. Прочтите текст. Постарайтесь понять его содержание. Выполните задания после текста.**

### Bipolar Junction Transistor

1. A bipolar junction transistor (BJT) is a type of transistor. It is a three-terminal device constructed of doped semiconductor material and may be used in amplifying

or switching applications. Bipolar transistors are so named because their operation involves both electrons and holes.

Although a small part of the base-emitter current is carried by the majority carriers, the main current is carried by minority carriers in the base, and so BJTs are classified as «minority-carrier» devices.

2. A BJT consists of three differently doped semiconductor regions, the emitter region, the base region and the collector region. These regions are, respectively, p-type, n-type and p-type in a PNP, and n-type, p-type and n-type in a NPN transistor. Each semiconductor region is connected to a terminal, appropriately labeled: emitter (E), base (B) and collector (C).

The base is physically located between the emitter and the collector and is made from lightly doped, high resistivity material. The collector surrounds the emitter region, making it almost impossible for the electrons injected into the base region to escape being collected, thus making the resulting value of  $\alpha$  very close to unity, and so, giving the transistor a large  $\beta$ . A cross section view of a BJT indicates that the collector-base junction has a much larger area than the emitter-base junction.

3. The bipolar junction transistor, unlike other transistors, is not a symmetrical device. This means that interchanging the collector and the emitter makes the transistor leave the forward active mode and start to operate in reverse mode. Because the transistor's internal structure is usually optimized to forward-mode operation, interchanging the collector and the emitter makes the values of  $\alpha$  and  $\beta$  of reverse operation much smaller than those found in forward operation; usually, the  $\alpha$  of the reverse mode is lower than 0.5. The lack of symmetry is primarily due to the doping ratios of the emitter and the collector. The emitter is heavily doped, while the collector is lightly doped, allowing a large reverse bias voltage to be applied before the collector-base junction breaks down. The collector-base junction is reverse biased in normal operation. The reason the emitter is heavily doped is to increase the emitter injection efficiency: the ratio of carriers injected by the emitter to those injected by the base. For high current gain, most of the carriers injected into the emitter-base junction must come from the emitter.

Small changes in the voltage applied across the base-emitter terminals causes the current that flows between the emitter and the collector to change significantly. This effect can be used to amplify the input voltage or current. BJTs can be thought of as voltage-controlled current sources, but are more simply characterized as current-controlled current sources, or current amplifiers, due to the low impedance at the base.

4. Early transistors were made from germanium but most modern BJTs are made from silicon. A significant minority are also now made from gallium arsenide, especially for very high speed applications.

**Notes:**

junction transistor	плоскостной транзистор
to dope	добавлять примеси
base-emitter current	ток, протекающий от базы к эмиттеру

minority current carriers	неосновные носители тока
forward active mode	режим прямого смещения
reverse bias	обратное смещение

**5. Укажите, какие из данных утверждений соответствуют содержанию текста.**

1. Bipolar junction transistors refer to «majority current carrier» devices.
2. The material used for making the base is usually lightly doped and has high resistivity.
3. Due to its properties transistors are used as current amplifiers.

**6. Выберите правильные ответы на вопросы.**

1. What material is more popular for making transistors?
  - (a) germanium;
  - (b) silicon.
2. Why is the emitter doped heavier than collector?
  - (a) In order to increase the number of current carriers injected by the emitter.
  - (b) In order to decrease the emitter injection efficiency.

**7. Прочтите предложения. Выберите правильный вариант перевода.**

1. This means that interchanging the collector and the emitter makes the transistor leave the forward active mode and start to operate in reverse mode.

(a) Это значит, что переключения коллектора и эмиттера вынуждают транзистор переходить из активного прямого режима в обратный режим

(b) Это значит, что меняющиеся коллектор и эмиттер вынуждают транзистор оставить активный режим и начать работать в обратном режиме.

2. The lack of symmetry is primarily due to the doping ratios of the emitter and the collector.

(a) Сначала отсутствие симметрии является результатом соотношения уровней примесей в эмиттере и коллекторе.

(b) Отсутствие симметрии в первую очередь объясняется соотношением уровней примесей в эмиттере и коллекторе.

3. It makes the resulting value of  $\alpha$  very close to unity.

(a) Это приводит к тому, что значение  $\alpha$  приближается к единице.

(b) Это делает результирующую величину  $\alpha$  близкой единству.

**8. Переведите на русский язык 3 – 4 абзацы текста.**

**Вариант 3**

**1. Переведите следующие предложения на русский язык, обратив внимание на неличные формы глагола.**

1. Computing involves different arithmetic and logic operations.
2. The experiment having been made, everybody was interested in the results.

3. There is one important factor to consider.
4. Benjamin Franklin is acknowledged to be the founder of the theory of atmospheric electricity.
5. The control unit operates by reading one instruction at a time.

**2. Переведите следующие предложения, обратив внимание на местоимения-заменители существительных.**

1. The results of this experiment differ greatly from those received in the previous one.
2. The method investigated for solving these problems is that of combinatorial programming.
3. The solution suggested by him had much in common with ours.
4. Our values are not in accord with those obtained by previous students.
5. Tiny crystals are used to produce light which carries information along the fibres. This passes through a lens into the fibre.

**3. Переведите следующие предложения, обратив внимание на усилительные конструкции.**

1. We failed to estimate the variables, nor do we know how to evaluate the performance of the system.
2. It was this device that brought a revolution in the development of electronics.
3. The investigation does, however, illustrate the basic approach to the problem.
4. It is the computers, which provide the key to the fully automatic factories of the future.
5. It is Norbert Wiener who is considered to be the father of cybernetics.

**4. Прочтите текст. Постарайтесь понять его содержание. Выполните задания после текста.**

**Types of Bipolar Junction Transistors**

1. NPN is one of the two types of bipolar transistors, in which the letters «N» and «P» refer to the majority charge carriers inside the different regions of the transistor. Most bipolar transistors used today are NPN, because electron mobility is higher than hole mobility in semiconductors.

NPN transistors consist of a layer of P-doped semiconductor (the «base») between two N-doped layers. NPN transistors are commonly operated with the emitter at ground and the collector connected to a positive voltage through an electric load. A small current entering the base in common-emitter mode is amplified in the collector output.

The arrow in the NPN transistor symbol is on the emitter leg and points in the direction of the conventional current flow when the device is in forward active mode.

2. The other type of BJTs is PNP with the letters «P» and «N» referring to the majority charge carriers inside the different regions of the transistor. Few transistors used today are PNP, since the NPN type gives better performance in most circumstances.

PNP transistors consist of a layer of N-doped (often doped with boron) semiconductor between two layers of P-doped (often with arsenic) material. PNP transistors are commonly operated with the collector at ground and the emitter connected to a positive voltage through an electric load. A small current entering the base prevents current from flowing between the collector and emitter.

3. The heterojunction bipolar transistor (HBT) is an improvement of the BJT that can handle signals of very high frequencies up to several hundred GHz. It is common nowadays in ultrafast circuits, mostly RF systems.

Heterojunction transistors have different semiconductors for the elements of the transistor. Usually the emitter is composed of a larger bandgap material than the base. This helps reduce minority carrier injection from the base when the emitter-base junction is under forward bias and increases emitter injection efficiency. The improved injection of carriers into the base allows the base to have a higher doping level, resulting in lower resistance to access the base electrode. With a regular transistor, also referred to as homojunction, the efficiency of carrier injection from the emitter to the base is primarily determined by the doping ratio between the emitter and base. Because the base must be lightly doped to allow the high injection efficiency its resistance is relatively high. With a heterojunction the base can be highly doped allowing a much lower base resistance and consequently higher frequency operation.

4. Two commonly used HBT's are silicon-germanium and aluminum-gallium arsenide. Silicon-germanium is widely used because it is compatible with standard silicon digital processes, allowing integration of very high speed circuitry with complex lower speed digital circuitry.

**Notes:**

junction transistor	плоскостной транзистор
to dope	добавить примесь
majority/minority current carriers	основные/неосновные носители тока
performance	(рабочие) характеристики
homo/heterojunction	гомо/гетероструктурный переход
forward/reverse bias	прямое/обратное смещение

**5. Укажите, какие из данных утверждений соответствуют содержанию текста.**

1. The arrow on the emitter leg in the NPN transistor symbol indicates the direction of the conventional current flow in reverse operating mode.
2. Nowadays, NPN transistors are more popular.
3. In homojunction transistors the base is usually doped lightly.

**6. Выберите правильные ответы на вопросы.**

1. What voltage is usually applied to the collector of NPN transistor in active mode?
  - (a) positive;
  - (b) negative.

2. What circuits are HBTs used today?
  - (a) in very high frequency circuits;
  - (b) in very low frequency circuits.

**7. Прочтите предложения. Выберите правильный вариант перевода.**

1. NPN-transistors are commonly operated with the emitter at ground and the collector connected to a positive voltage through an electric load.

(a) NPN-транзисторы обычно работают при эмиттере, подключенном к земле, а на коллектор через электрическую нагрузку подается положительное напряжение.

(b) NPN-транзисторы обычно работают с эмиттером на земле и коллектором, подсоединенном к положительному напряжению через электрическую нагрузку.

2. A small current entering the base prevents current from flowing between the collector and emitter.

(a) Небольшой ток, поступающий на базу, отсекает ток между коллектором и эмиттером.

(b) Небольшой ток, поступающий на базу, предотвращает ток от протекания между коллектором и эмиттером.

3. NPN-transistors consist of a layer of P-doped semiconductor (the base) and two N-doped layers commonly referred to as collector and emitter.

(a) NPN-транзисторы состоят из полупроводникового слоя р-типа (базы) и двух слоев n-типа, обычно называемых эмиттером и коллектором.

(b) NPN-транзисторы состоят из полупроводникового слоя р-типа (базы) и двух слоев n-типа, обычно относящихся к эмиттеру и коллектору.

**8. Переведите на русский язык 2 – 3 абзацы текста.**

**Вариант 4**

**1. Переведите следующие предложения на русский язык, обратив внимание на неличные формы глагола.**

1. System design progresses through several stages, becoming detailed in each stage.
2. The other conditions being equal, the acceleration will be the same.
3. Based on stage-by-stage schedule, the programme embraces different fields of space research and exploitation.
4. The syntax and semantics of these languages are very sophisticated, making the translation to machine languages a complex process.
5. Computer attacked by the virus crushed.

**2. Переведите следующие предложения, обратив внимание на местоимения-заменители существительных.**

1. The result, like the one just described, is not surprising.
2. The robot, which he has made is more reliable than mine.

3. Carbon, silicon and germanium have a unique property in their electron structure. This allows them to form nice crystals.

4. One positive charge is now called a proton and this charge is equal to that of one electron.

5. Computers of today are hundred times smaller than those of the first generation.

**3. Переведите следующие предложения, обратив внимание на усилительные конструкции.**

1. Only when we passed to the distributed way of processing did the system work perfectly.

2. It is precisely this opinion that influenced the research in the sphere of computer memory improvement.

3. Only then does the increase of voltage not lead to output current amplification.

4. It is this technique that we do subject to doubts and consider it non effective.

5. It was the Russian scientist Lodygin who invented the electric lamp.

**4. Прочтите текст. Постарайтесь понять его содержание. Выполните задания после текста.**

### **Transistor Models**

1. Transistors are complicated devices. In order to ensure the reliable operation of circuits employing transistors, it is necessary to model the physical phenomena observed in their operation analytically using transistor models. There exists a variety of different models, that range in complexity.

Transistor models are used for almost all modern electronic design work. Analog circuit simulators such as SPICE use models to predict the behavior of a design. Most design work is related to integrated circuit designs which have a very large tooling cost, primarily for the masks used to create the devices, and there is a large economic incentive to get the design working without any iteration. Complete and accurate models allow a large percentage of designs to work the first time.

Modern designs are usually very complex or for some application that requires low power, high speed, or some other specialized performance that is difficult to predict without accurate models of the devices used. Comprehensive models include the primary terminal current-voltage characteristics, capacitances between terminals, and parasitic capacitance, resistance, and inductance, time delays, and temperature effects.

2. Non-linear or large signal transistor models fall into three main types:

Physical models – These types of models are based upon the device physics describing the specific phenomena within a transistor. Parameters within these models are based upon physical properties such as oxide thicknesses, substrate doping concentrations, carrier mobility, etc.

Empirical models – This type of model is entirely based upon curve fitting techniques, using whatever equations most accurately fits the measured data to specify the operation of the transistor in simulation. Unlike the previous model, the

parameters within such a model have no basis on physical constants and are instead simply the coefficients, exponents, etc., used in the measured data curve-fitting expressions.

Table models – The third type of model is a form of look-up table containing a large number of values for common device parameters such as drain current and device parasitics. These values are indexed in reference to their corresponding bias voltage combinations. Thus, model accuracy is increased by inclusion of additional data points within the table. The chief advantage of this type of model is decreased simulation time.

Non-linear models are used with a computer simulation program, such as SPICE. The use of non-linear models, which describe the entire operating area of a transistor, is required for digital designs and large signal circuits such as power amplifiers.

3. Small signal, or linear, models are still often used to evaluate stability and gain in circuits where the signal is much smaller than the bias voltages. A big advantage of small signal models is they can be solved directly, while large signal non linear models must be iterated with a computer simulator. The tools for designing with transistor parameters include simultaneous equations, determinants, and matrix theory (often studied as part of linear algebra), especially Cramer's rule.

**Notes:**

performance	(рабочие) характеристики
iteration	итерация (повторение)
incentive	стимул
substrate	подложка
drain current	ток стока
bias voltage	напряжение смещения
curve-fitting technique	метод аппроксимации кривых

**5. Укажите, какие из данных утверждений соответствуют содержанию текста.**

1. Transistor models are very useful for all modern design work.
2. Integrated circuit designs have a very cheap tooling cost.
3. The advantage of small signal models is that they can be solved directly, while large signal non linear models must be iterated with a computer simulator.

**6. Выберите правильные ответы на вопросы.**

1. What is the main advantage of table models?
  - (a) decreased simulation time;
  - (b) very long simulation time.
2. What is the main advantage of linear models?
  - (a) They can be solved directly.
  - (b) They need computer simulation.

**7. Прочтите предложения. Выберите правильный вариант перевода.**

1. Non linear models fall into three main types.

(a) Нелинейные модели распадаются на три типа.

(b) Нелинейные модели делятся на три типа.

2. Model accuracy is increased by inclusion of additional data points within the table.

(a) Аккуратность модели увеличивается за счет включения дополнительных данных в таблицу.

(b) Точность модели увеличивается за счет включения в таблицу дополнительных данных.

3. The third type of model is a form of look-up table containing a large number of values.

(a) Третий тип модели представляет собой справочную таблицу со множеством значений.

(b) Третий тип модели представляет форму таблицы поиска со множеством значений.

**8. Переведите на русский язык 2 – 3 абзацы текста.**

**Вариант 5**

**1. Переведите следующие предложения на русский язык, обратив внимание на неличные формы глагола.**

1. Electronic computers perform both arithmetic and logical operations, making it possible to control the process under rather complicated conditions.

2. The idea of using symbols instead of words was very helpful.

3. For 2200 years all the mankind believed Euclid to have discovered an absolute truth presented in his geometrical theory.

4. This method, previously mentioned as affording good results, is being widely used.

5. The lecture was too brief to give a complete description of the invention.

**2. Переведите следующие предложения, обратив внимание на местоимения-заместители существительных.**

1. The problem to be solved is fundamentally a mathematical one.

2. The first systems to be introduced were analogue, these are still the most used, and they offer the widest coverage within the most countries.

3. The obtained reflection coefficient is identical with that we had in the previous experiment.

4. The first solar battery operated with semiconductor crystals similar to those used in transistors.

5. The results of my test are better than his.

**3. Переведите следующие предложения, обратив внимание на усилительные конструкции.**

1. It is the hydroengineering complex which will protect St. Petersburg from floods.
2. It is the advantages of transistor that made possible to increase the performance of electronic devices.
3. It was not until the early eighties that personal computers became widely used.
4. The ion does have a definite mobility that does not change with time.
5. The last experiment gave us much better results than did the previous ones.

**4. Прочтите текст. Постарайтесь понять его содержание. Выполните задания после текста.**

### **Telephone**

1. In a conventional telephone system, the caller is connected to the person they want to talk to by the switches at various exchanges. The switches form an electrical connection between the two users and the setting of these switches is determined electronically when the caller dials the number based upon either pulses or tones made by the caller's telephone. Once the connection is made, the caller's voice is transformed to an electrical signal using a small microphone in the telephone's receiver. This electrical signal is then sent through various switches in the network to the user at the other end where it is transformed back into sound waves by a speaker for that person to hear. This person also has a separate electrical connection between him and the caller which allows him to talk back. Today, the fixed-line telephone systems in most residential homes are analogue – that is the speaker's voice directly determines the amplitude of the signal's voltage. However although short-distance calls may be handled from end-to-end as analogue signals, increasingly telephone service providers are transparently converting signals to digital before converting them back to analogue for reception.

2. Mobile phones have had a dramatic impact on telephone service providers. Mobile phone subscriptions now outnumber fixed line subscriptions in many markets. Sales of mobile phones in 2005 totalled 816.6 million.

3. However there have been equally drastic changes in telephone communication behind the scenes. Starting with the operation of TAT-8 in 1988, the 1990s saw the widespread adoption of systems based upon optic fibres. The benefit of communicating with optic fibres is that they offer a drastic increase in data capacity. TAT-8 itself was able to carry 10 times as many telephone calls as the last copper cable laid at that time and today's optic fibre cables are able to carry 25 times as many telephone calls as TAT.

This drastic increase in data capacity is due to several factors. First, optic fibres are physically much smaller than competing technologies. Second, they do not suffer from crosstalk which means several hundred of them can be easily bundled together in a single cable.

4. Assisting communication across these networks is a protocol known as Asynchronous Transfer Mode (ATM). ATM remains the protocol of choice for most major long-distance optical networks. The importance of the ATM protocol was chiefly in its notion of establishing pathways for data through the network and associating a traffic contract with these pathways. The traffic contract was essentially an agreement between the client and the network about how the network was to handle the data. If the network could not meet the conditions of the traffic contract it would not accept the connection. This was important because telephone calls could negotiate a contract so as to guarantee themselves a constant bit rate, something that was essential to ensure a call could take place without the caller's voice being delayed in parts or cut-off completely.

**Notes:**

exchange	коммутаторная станция
impact	здесь: влияние
data capacity	информационная емкость
to meet the conditions of smth.	соответствовать условиям чего-либо
ATM	асинхронный режим передачи (данных), протокол ATM

**5. Укажите, какие из данных утверждений соответствуют содержанию текста.**

1. Nowadays, more and more telephone communication employs systems are based on optic fibres.
2. The advantage of optic fibres is their greater data capacity.
3. One of the drawbacks of optic fibres is that they greatly suffer from crosstalks.

**6. Выберите правильные ответы на вопросы.**

1. What kind of systems are used in fixed-line telephone communication in residential homes?
  - (a) digital;
  - (b) analogue.
2. Has data capacity in telephone communication increased or decreased?
  - (a) increased;
  - (b) decreased.

**7. Прочтите предложения. Выберите правильный вариант перевода.**

1. ATM remains the protocol of choice for most major long-distance optical networks.
  - (a) Протокол ATM остается наиболее предпочитаемым протоколом трафика данных в основных оптических сетях дальней связи.
  - (b) Протокол ATM остается протоколом выбора для трафика данных для большинства оптических сетей связи на больших расстояниях.

2. Mobile phones have had a dramatic impact on telephone service providers.

(a) Мобильные телефоны имели драматический толчок на провайдеров услуг телефонной связи.

(b) Мобильные телефоны оказали существенное влияние на провайдеров телефонной связи.

3. Short-distance calls may be handled from end-to-end as analogue signals.

(a) Прямая связь на небольших расстояниях может осуществляться посредством аналоговых сигналов.

(b) Звонки на небольшом расстоянии могут осуществляться аналоговыми сигналами.

**8. Переведите на русский язык 2 – 4 абзацы текста.**

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## СОДЕРЖАНИЕ

КОНТРОЛЬНАЯ РАБОТА №5.....	3
Вариант 1.....	5
Вариант 2.....	9
Вариант 3.....	12
Вариант 4.....	16
Вариант 5.....	19
КОНТРОЛЬНАЯ РАБОТА №6.....	23
Вариант 1.....	26
Вариант 2.....	29
Вариант 3.....	31
Вариант 4.....	34
Вариант 5.....	37

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**МЕТОДИЧЕСКИЕ УКАЗАНИЯ  
И КОНТРОЛЬНЫЕ ЗАДАНИЯ №5–6  
ПО АНГЛИЙСКОМУ ЯЗЫКУ ДЛЯ СТУДЕНТОВ ФЗО**

**METHODICAL DIRECTIONS AND TESTS №5–6  
IN ENGLISH FOR THE STUDENTS  
OF THE FACULTY OF EXTRAMURAL EDUCATION**

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