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## **АНГЛИЙСКИЙ ЯЗЫК**

**Методические указания, грамматический справочник  
и контрольная работа №4  
для студентов II курса ОПУ, АТС, ИС, ЭПС, ЭНС, ЭСС  
заочной формы обучения**

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Методические указания состоят из двух разделов – грамматический справочник и контрольные работы по специальностям.

Цель методических указаний – предоставить необходимый материал для изучения грамматических тем и выполнения контрольных работ. Работы составлены с учетом специальностей. Тексты каждой контрольной работы отражают одну из специальностей университета и включают в себя достаточное количество специальной лексики.

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## ВВЕДЕНИЕ

Данные указания и контрольная работа составлены для студентов II курса ИИФО (ОПУ, АТС, ИС, ЭПС, ЭНС, ЭСС)

Основная цель указаний состоит в том, чтобы в соответствии с требованием программы по иностранным языкам подготовить студентов к выполнению контрольной работы №4. Для этого в пособие включены грамматический справочник по теме «Причастие 1 и 2» и «Независимый причастный оборот».

Основная часть указаний состоит из контрольных работ по специальностям. Каждая контрольная работа включает в себя 5 вариантов грамматических заданий и текст. Лексическая наполняемость грамматических заданий и текстов соответствует специальности, которую изучают студенты.

## 1. ВЫПОЛНЕНИЕ КОНТРОЛЬНЫХ ЗАДАНИЙ И ОФОРМЛЕНИЕ КОНТРОЛЬНЫХ РАБОТ

1. Количество контрольных заданий, выполняемых вами на каждом курсе, устанавливается учебным планом института.

2. Каждое контрольное задание в данном пособии предлагается в пяти вариантах. Вы должны выполнить один из пяти вариантов в соответствии с последними цифрами студенческого шифра: студенты, шифр которых оканчивается на 1 или 2, выполняют вариант №1; на 3 или 4—№2; на 5 или 6 - №3; на 7 или 8 - №4; на 9 или 0 - №5. Все варианты заданий предназначаются студентам ИИФО факультетов технического и гуманитарного профиля. Выполняются они в общем порядке в соответствии с цифрами студенческого шифра.

3. Выполнять письменные контрольные работы следует в отдельной тетради. На обложке тетради напишите шифр, номер контрольной работы, свою фамилию и адрес.

4. Контрольные работы должны выполняться чернилами, аккуратно, четким почерком. При выполнении контрольной работы оставляйте в тетради широкие поля для замечаний, объяснений и методических указаний рецензента.

Материал контрольной работы следует располагать в тетради по следующему образцу:

Левая страница		Правая страница	
Поля	Английский текст	Русский текст	Поля

5. Контрольные работы должны быть выполнены в той последовательности, в которой они даны в настоящем пособии.

6. Выполненные контрольные работы направляйте для проверки и рецензирования в институт в установленные сроки.

7. Если контрольная работа выполнена без соблюдения указаний или не полностью, она возвращается без проверки.

## ИСПРАВЛЕНИЕ РАБОТЫ НА ОСНОВЕ РЕЦЕНЗИЙ

1. При получении от рецензента рецензии на проверенную контрольную работу внимательно прочитайте рецензию, ознакомьтесь с замечаниями рецензента и проанализируйте отмеченные в работе ошибки.

2. Руководствуясь указаниями рецензента, проработайте еще раз учебный материал.

3. Только после того, как будут выполнены все указания рецензента и исправлены все ошибки, можно приступить к изучению материала очередного контрольного задания и его выполнению.

4. Отрецензированные контрольные работы являются учебными документами, которые необходимо сохранять; помните о том, что во время зачета или экзамена производится проверка усвоения материала, вошедшего в контрольные работы.

### 2. ГРАММАТИЧЕСКИЙ СПРАВОЧНИК

#### Формы причастия 1.

	Действительный залог	страдательный залог
неперфектные	asking	being asked
перфектные	having asked	having been asked

#### 2.1. Функции и перевод причастия 1 (неперфектная форма действительного залога).

Причастие I (asking) является неличной формой глагола, которая входит в состав форм группы Continuous, а также употребляется в предложении самостоятельно в функциях определения и обстоятельства. В зависимости от функции в предложении причастие 1 переводится на русский язык причастным или деепричастным оборотом.

1. Причастие 1 в функции определения может стоять слева или справа от определяемого слова. В функции правого определения часто имеет при себе пояснительные слова, образуя определительный причастный оборот. На русский язык переводится действительным причастием, определительным причастным оборотом или определительным придаточным предложением. Неperфектные формы причастия 1 выражают действия, одновременные с действием, выраженным сказуемым предложения.

- The railways must meet the rowing needs of national economy.
- The people **living in the 18th century** traveled in carriages.
- The people **living in the 20th century** travel in automobiles.
- Железные дороги должны удовлетворять **растущие** нужды народного хозяйства.
- Люди, **жившие (которые жили) в восемнадцатом столетии**, ездили в каретах.
- Люди, **живущие (которые живут) в двадцатом столетии**, ездят в автомобилях.

2. Причастие 1 в функции обстоятельства имеет при себе пояснительные слова и стоит слева от подлежащего или справа от сказуемого. На русский язык переводится деепричастным оборотом (реже обстоятельством придаточным предложением или существительным с предлогом). Причастные обороты времени часто вводятся союзами when, while, которые на русский язык не переводятся.

- **(While) laying down the track** the builders use powerful machines.
- **Укладывая путь (при укладке пути)**, строители используют мощную технику.

## 2.2. Функции и перевод причастия II.

Причастие II (asked, given) является неличной формой глагола, которая входит в состав форм группы Perfect и всех форм страдательного залога, а также употребляется в предложении самостоятельно в функциях определения и обстоятельства.

1. Причастие II в функции определения может стоять слева или справа от определяемого слова, образуя левое или правое определение, и на русский язык переводится страдательным причастием.

- The **constructed** railway was 15 miles long.
- The railway **constructed** carried heavy traffic.
- **Построенная** железная дорога была длиной в 15 миль.
- **Построенная** железная дорога осуществляла на-пряженные перевозки.

В функции правого определения причастие II может иметь пояснительные слова, образуя определительный причастный оборот,

который переводится русским причастным оборотом или определительным придаточным предложением.

- The speeds **developed by electric locomotives** are enormous.
- Скорости, **развиваемые электровозами (которые, развивают электровозы)**, огромны.

2. Причастие II в функции обстоятельства стоит, как правило, слева от подлежащего или справа от сказуемого и обычно вводится союзами when, if (реже unless, *если не*, before). На русский язык переводится обстоятельственным придаточным предложением со сказуемым в страдательном залоге.

- **When constructed**, the railway was carefully tested.
- **Когда железная дорога была построена**, ее тщательно проверили.

В отдельных случаях возможен перевод существительным с предлогом или сочетанием «союз + инфинитив».

- Metal bars become longer if **heated**.
- Металлические брусья **при нагревании, (если их нагреть)** удлиняются.

### 2.3. Независимый причастный оборот (Absolute Participle Construction).

Независимый причастный оборот состоит из существительного в общем падеже или местоимения в именительном падеже и причастия. В независимых причастных оборотах могут употребляться все формы причастия 1 и причастие II; на письме эти обороты отделяются запятой. В русском языке подобных конструкций нет.

Независимый причастный оборот переводится на русский язык самостоятельным или придаточным предложением.

- **The project having been completed**, the engineer submitted it to the commission.
- **Когда проект был завершен**, инженер представил его на рассмотрение комиссии.

При переводе независимого причастного оборота следует обращать внимание на его место в предложении. Оборот, стоящий справа от главного предложения, переводится самостоятельным предложением без союза или предложением, вводимым союзами: *причем, при этом, а, но*.

- Railways use many types of locomotives, **the most powerful of them operating on main lines**.
- На железных дорогах используют много типов локомотивов, **(причем) самые мощные из них работают на магистральных линиях**.

Оборот, стоящий слева от главного предложения, переводится обычно обстоятельственным придаточным предложением, вводимым союзами: *так как, если, когда, после того как*.

- **The locomotive tested**, some improvements had to be made in its design.
- **Когда локомотив был испытан**, пришлось внести усовершенствования в его конструкцию.

Перфектная форма причастия выражает действие, совершенное ранее действия, выраженного сказуемым.

- Electronics **having been introduced**, the efficiency of railway operation considerably increased.
- **После того как была внедрена электроника**, эффективность управления железными дорогами значительно возросла.

Иногда независимый причастный оборот вводится предлогом **with**.

- **With the concrete sleepers being used**, a greater stability of track is ensured.
- **Когда используются бетонные шпалы**, (при использовании бетонных шпал) обеспечивается большая устойчивость пути.



**Контрольная работа № 4 (ОПУ)  
Вариант 1**

**1. Перепишите и переведите предложения, обращая внимание на перевод *Participle 1*.**

1. The fastest super - express developing 500 kph could compete with air transport.
2. The stationmaster observed the express train leaving the station.
3. One should take into account a number of problems while improving work of marshaling yards.

**2. Перепишите и переведите предложения, обращая внимание на перевод *Participle 2*.**

1. Containers perfectly arranged and controlled served as the best means of goods transportation.
2. Diesel shunting locomotives designed for marshaling yards pushed trains over the hump much quicker than it was done before.
3. When sorting trains the radio makes the work of railway men much easier.

**3. Перепишите и переведите предложения, обращая внимание на перевод *независимого причастного оборота*.**

1. There they are combined, according to their respective destinations to form freight trains, each wagon being labeled to indicate its destination.
2. On modern railways equipped with centralized traffic control and automatics, two men are usually quite enough to operate a freight train, no conductor or brakemen being necessary.
3. Electronic equipment being highly reliable, many railroads began using it for working in marshaling yards.

**4. Перепишите и переведите текст по специальности.**

**HUMP YARDS**

Hump yards\* speed the work of classification. These yards make use of the law of gravity. In hump yards, switch engines or shunting locomotives push incoming trains along a single track to the top of a low hill, or hump. On the other side of the hump, the track branches out\* into a number of classification tracks or sorting sidings. As each car reaches the top of the hump, it is uncoupled and the proper switches\* are opened. The car is weighed, and it rolls down the hump onto its assigned track or siding by gravity. The cars are then collected from

various tracks to form a unit train on the departure lines. The unit train\* proceeds on its journey as soon as the engine is attached and the main line is clear to receive the train from the yard. The reception and departure lines are of length sufficient to accommodate the longest goods trains running in the section served by the marshaling yard. The number of tracks in the reception and departure lines depends on the number of goods trains to be marshaled, the time taken for marshaling each train, the time required for inspecting cars for possible defects and on the density of traffic on the main line. All the yards are classified by hump capacity, i.e. the throughput of cars per day, into small, medium and high capacity yards handling up to 6000 and more cars/day. This operation is impossible without reliable automatic devices.

Notes:

\*hump yard- горочный парк

\*to branch out- ответвляться

\*a switch- стрелка

\*a unit train =a block train- маршрутный поезд

## Контрольная работа № 4 (ОПУ) Вариант 2

### **1. *Перепишите и переведите предложения, обращая внимание на перевод Participle 1.***

1. While offering quick transportation of goods and passengers, combined traffic provides a considerable economy in the costs of movement.
2. Having been given all the instructions the driver started the train.
3. All railways have tendency towards concentration of sorting operations with few numbers of marshaling yards having a considerable handling capacity.

### **2. *Перепишите и переведите предложения, обращая внимание на перевод Participle 2.***

1. The control of the retards and the points of the sorting sidings is concentrated in a panel installed in front of the model.
2. A suspended-type train, when exhibited at the Japanese National Pavilion, attracted the attention of the visitors as a «train of the future».
3. The advantage of the diesel engine lies in the high efficiency obtained.

### **3. *Перепишите и переведите предложения, обращая внимание на перевод независимого причастного оборота.***

1. The next wagon or a group of wagons roll into another siding, these operations being repeated.
2. All train movements being governed by signal installations, written train orders are not issued.
3. There being a number of small railways in great Britain, they were provided with a number of small marshaling yards, situated close together.

**4. Перепишите и переведите текст по специальности.**

### **HUMP YARDS**

The newest hump yards\* are almost completely automated. Automated hump yards not only require fewer workers than did older hump yards, but they also make classification quicker and more efficient. Computers control most of the yard operations. They assign cars to the proper track and so reduce the possibility of error. They also operate the hump switches\* and control special braking devices built into the hump tracks. These devices, called retarders\*, regulate a car's speed as it rolls down the hump. The car thus meets the other cars on its track with just enough force to operate its coupler \*. These retarders are operated electrically or electro-pneumatically so that they press against the sides of wheels and bring the cars to a stop.

Automated hump yards help speed interchange by preblocking\* cars on a freight train – that is, by arranging all the cars on the train into groups according to their final destination. Cars on such a block train \* do not have to be reclassified at interchanges or yards. Unit trains further reduce the number of switching or eliminate switching entirely. Unit trains have a single type of freight car loaded with a single type of freight, such as coal or wheat. The cars all have the same destination and remain together until they reach it. Many unit trains make regular nonstop runs between the same two terminals – for example, between a coal mine and an electric power plant.

Notes:

\*a hump yard – горочный парк

\*a switch – стрелка

\*a retarder – замедлитель

\*a coupler – сцепщик

\*preblocking – предварительное объединение вагонов по маршрутам

\*a block (unit) train – маршрутный поезд

**Контрольная работа № 4 (ОПУ)**

**Вариант 3**

**1. Перепишите и переведите предложения, обращая внимание на перевод Participle 1.**

1. The freight yard being built in this district will have a hump equipped with automatic retarders.
2. While processing the reports, the computers check the location of trains as they «move» them from one control section to another.
3. The stopping of wagons rolling down a hump at the exact place required, presents a difficulty in hump working.

**2. Перепишите и переведите предложения, обращая внимание на перевод Participle 2.**

1. We watched the new shunting locomotive tested.
2. Experience of the work carried out at a number of railways has shown that the use of centralized traffic control and TV has greatly facilitated the work of sorting stations.
3. The control of the retarders and the points of the sorting sidings is concentrated in a panel installed in front of the model.

**3. Перепишите и переведите предложения, обращая внимание на перевод независимого причастного оборота.**

1. In order to simplify the problem of running trains, all railroads are divided into divisions, a division superintendent being responsible for train movement.
2. CTC saving much time, many railroads reduce the number of passing sidings, the amount of track and money.
3. Block signals having been installed, the trains could run closer together.

**4. Перепишите и переведите текст по специальности.**

### **Freight Train Working**

The arrangement and operation of freight trains have little in common with those of passenger trains. There are no constant factors in freight train operation. A large number of variables has to be dealt with in freight operation. The first problem in the case of freight working is what the train load is to be. Goods are not loaded in the same quantities nor for the same destinations, but they depend on the loads which must be transferred and also on the loading and trains running from other yards.

Cars are loaded at thousands of different points for thousands of different destinations. They can reach their destinations only associated in the form of trains with other cars, which share part of their journey. Marshaling yards are

the means by which cars are assembled into trains and it is here that freight cars are formed into trains.

Freight trains may pass from one yard to another in two forms. The cars may be assembled without regard to destination, or cars are marshaled on the train in sections according to ultimate destination to facilitate the work of shunting at the next yard.

It is obvious that the efficiency of work can be obtained if freight trains are run at higher speeds for long distances.

### **Контрольная работа № 4 (ОПУ) Вариант 4**

**1. *Перепишите и переведите предложения, обращая внимание на перевод Participle 1.***

1. In centralized traffic control the dispatcher's working place is fitted with special apparatuses allowing him to move signals and control train's movement nowadays automatically.
2. Loaded wagons rolling down the hump are controlled by retarders.
3. Having received information about traffic condition on his division, the chief dispatcher ordered extra trains.

**2. *Перепишите и переведите предложения, обращая внимание на перевод Participle 2.***

1. A well-laid out marshaling yard is divided into three sets of sidings: reception lines, sorting sidings and departure lines.
2. As the loaded wagons leave the goods shed, they pass into the adjoining sidings.
3. An important function of the freight train crew is to watch the air brakes, and to set them when required, by operating a valve at the rear end of the train.

**3. *Перепишите и переведите предложения, обращая внимание на перевод независимого причастного оборота.***

1. On some railroads there are two classes of passenger traffic, first class trains being fast expresses.
2. The importance of block signals being recognized, they are used on railways.
3. Containers being widely used all over the world, the railway men have come to a conclusion that the most efficient means of handling good is container usage.

#### **4. *Перепишите и переведите текст по специальности.***

### **Controlling Car Speed in Marshaling Yards**

Gravity has been used for over hundred years for sorting cars in marshaling yards, but this technique requires some method of controlling speed. A moving car must run to the far end of a sorting siding but must not move at more than 1m/s, at the beginning of the siding if it is full of cars.

Most of the hump yards in use today are of the gradient type\* with a fall from the hump to the far end of the siding, or the valley type\* in which the sidings rise at the far end.

It is evident that a car moving in the gradient yard only requires suitable deceleration, the siding being provided with a row of simple retarders to maintain the speed of the cars more or less constant and within the permissible limits.

But handling cars in the valley marshaling yard may require both boosters\* and retarders.

Certain retarder units can be given a dual action so that they accelerate the cars instead of retarding them. Such a system should be the best possible as it could be adapted to almost any marshaling yard profile.

Notes:

\* gradient type – парк со сплошным уклоном

\* valley type – парк с частичным уклоном

\* booster – усилитель торможения

### **Контрольная работа № 4 (ОПУ)**

#### **Вариант 5**

#### **1. *Перепишите и переведите предложения, обращая внимание на перевод Participle 1.***

1. A moving wagon in a gradient yard only requires suitable deceleration.
2. Loading and unloading operations are performed when handling freight at the station.
3. Simultaneous cutting of two trains being applied at the Gorky yard increased hump efficiency by up to 25%

#### **2. *Перепишите и переведите предложения, обращая внимание на перевод Participle 2.***

1. One delayed train may even effect the running of trains on other systems.

2. This service, developed in conjunction with the railways, represents a major new departure for combined transport.
3. Regional development is facilitated when well served by the transportation network.

**3. *Перепишите и переведите предложения, обращая внимание на перевод независимого причастного оборота.***

1. The Traffic Control Office having been installed in the new yard, the railway officers could get information of the exact positions of trains.
2. There are three types of marshaling yards, the oldest ones being flat and gravitation yards.
3. The sidings used for marshaling the traffic are called sorting sidings, their number being governed by the number of centers to which it is necessary to dispatch trains.

**4. *Перепишите и переведите текст по специальности.***

### **Improving Yards**

Simultaneously with the introduction of railroad automation special attention has been paid in Russia to the introduction of technological improvements and the reconstruction of specific parts of the yard to achieve better efficiency. In this respect the Gorky yard is of a particular interest. Several organizational and technological measures were undertaken at this yard, aimed at an overall increase in efficiency of marshaling yard operations. Simultaneous release of two trains is carried out at the yard.

Cutting of the trains is carried on not as two independent systems but rather as two interacting parallel systems. A special hump system was constructed for this purpose. The marshaling yard has five groups of lines, with two outside groups\* used for accepting cars of up and down directions, and the central group\* (adjacent to both run-down tracks\*) used for the «two-way stream»\* – i.e. cars of both directions.

With a parallel cut, there could be a situation in which two similar cuts would be directed to the central group. In this case, the cut which arrived first on the isolating section would be directed to a spare track\* for a subsequent second shunting operation through the hump. Probability of the simultaneous arrival of similar train cuts is comparatively small and at the Gorky yard is seldom more than 2 %.

The application of simultaneous cutting of two trains increases hump efficiency by up to 25 %.

Notes:

- \* outside groups – крайние пучки
- \* central group – средний пучок
- \* run-down tracks – спускные пути
- \* two-way stream – угловой поток
- \* spare track – отсечной путь

## Контрольная работа № 4 (АТС, ИС) Вариант 1

### **1. *Перепишите и переведите предложения, обращая внимание на перевод Participle 1.***

1. Many achievements of modern science and engineering have been introduced into the design of a new locomotive including the automatic speed control.
2. While carrying out experiments with the computer the scientists clearly saw its disadvantages.
3. The computer made a plane of the station's work having processed the data on the freight trains.

### **2. *Перепишите и переведите предложения, обращая внимание на перевод Participle 2.***

1. The impulses received converted the codes into numbers.
2. The AT&C Faculty is completed with highly qualified lecturers, teachers and scientific workers.
3. Designing and operation of modern communication systems require highly skilled specialists.

### **3. *Перепишите и переведите предложения, обращая внимание на перевод независимого причастного оборота.***

1. On railways computers are used for planning trains movement, they being introduced into the CTC system.
2. The primary task of computers on railways is data collection, information being recorded and processed.
3. The principal part of the computer, its "brain", is what is called "software", here Russian scientists having made a contribution.

### **4. *Перепишите и переведите текст по специальности:***



A computer can have a variety of input devices. This allows the user to control the computer in different ways, or to put different kinds of data into the computer. The most common input device is the keyboard. Another very common input device is the mouse. This is used to control the computer when the operating system has a graphical user interface. There are different types of mouse but the one illustrated in this unit is very common.

The computer keyboard is an electronic device with keys arranged like earlier typewriter keyboards, but with extra keys. Because the output of the keys is controlled by the computer program, their function can vary. For example, the print screen key sometimes copies the screen to memory and sometimes copies it to a printer, depending on the program used. The arrangement of the keys varies but most desktop PCs have an extended keyboard with keys divided into sections including the main keyboard, the function keys, the editing keys, and the numeric keypad.

### **Контрольная работа № 4 (АТС, ИС) Вариант 2**

**1. *Перепишите и переведите предложения, обращая внимание на перевод Participle 1.***

1. A transmitter installed in a locomotive allows a driver to radio other drivers warning them of a dangerous situation on the line.
2. This machine does the work of tens of thousands of men, performing eight thousands highly complex calculations per second.
3. A computer is a machine performing reasonable operations on the information and putting out answers.

**2. *Перепишите и переведите предложения, обращая внимание на перевод Participle 2.***

1. The centralized traffic control equipment developed by the Japanese National Railways provides high – speed transmission of information.
2. Trains equipped with an automatic system increase the traffic capacity of railways and ensure high safety of operation.
3. When used for setting the route the button must indicate which route is clear.

**3. *Перепишите и переведите предложения, обращая внимание на перевод независимого причастного оборота.***

1. Microprocessors were the key element in the development of the so called TV games, small units connected directly to TV sets producing some very exciting types of competition.
2. The signalman controls his territory with the help of control console, the track diagram showing him the position of all points and signals.
3. Electronic signaling techniques proved to be highly reliable, there being no system failure due to the electronic equipment.

#### **4. *Перепишите и переведите текст по специальности:***

The connection of computers throughout the world is known as the Internet. This allows users to send electronic mail messages (email) to each other. Each user has his or her own unique e-mail address. The e-mail address is made up of two main parts, the user identifier, and the computer system identifier.

For example:

Jim. Smith	@ ed.ac.uk
(user identifier)	(computer system identifier)

The @ sign is used to separate these main identifiers. A dot is used to separate the parts of each identifier. Note that there is usually no dot at the end of an email address.

Linked document pages on the Internet form what is known as the World Wide Web (WWW or Web). Each web page has its own unique address. Web addresses often, although not always, begin with 'http://www'. The two forward slashes are commonly read as double slash. A dot is used to separate each main part of an address, and slashes are used to separate sub-areas of the address.

### **Контрольная работа № 4 (АТС,ИС) Вариант 3**

#### **1. *Перепишите и переведите предложения, обращая внимание на перевод Participle 1.***

1. Modern railways with the fast moving traffic need a signal control center.
2. High – speed transmission of information was provided by the system using relays.
3. Setting up the route the signalman has only to press two buttons on the control console.

**2. Перепишите и переведите предложения, обращая внимание на перевод Participle 2.**

1. There is a specialized student-computing center equipped with the latest models of computers.
2. A number of trains operating on the line is determined depending on the system of control used.
3. When used for setting the route the button must indicate which route is clear.

**3. Перепишите и переведите предложения, обращая внимание на перевод независимого причастного оборота.**

1. Railway computer centers in Moscow and St. Petersburg have to provide optimization of train operation on lines with high traffic density, the central computers delivering all the orders to be carried out.
2. Rapid transit authorities all over the world have rationalized automatic train operation by using cab signals to drive the train, the driver acting only as an attendant to deal with emergencies.
3. Electronic signaling techniques proved to be highly reliable, there being no system failure due to the electronic equipment.

**4. Перепишите и переведите текст по специальности:**

A variety of input devices can be connected to a computer to allow the user to input different kinds of data and to control the computer in different ways. Some common input devices and their functions are shown below:

**Standard input device:**

A keyboard is main input device controlling the computer and inputting text and numerical data.

**Cursor control input devices:**

A mouse is common input device for use with a graphical user interface. The mouse has a ball underneath that is rolled on a mouse mat.

A tracker ball is like a mouse turned upside down. The tracker ball remains in one position while the user rotates a small ball on top. Often used instead of a mouse on portable computers.

A joystick is a vertical lever, which allows the user to control the cursor precisely and at high speed. Particularly good for playing fast actions games.

A touch screen. The user interacts with the computer by lightly pressing their finger on a touch –sensitive area of the monitor screen.

**Контрольная работа № 4 (АТС, ИС)  
Вариант 4**

**1. *Перепишите и переведите предложения, обращая внимание на перевод Participle 1.***

1. It's possible to automate the pattern of current control of railway operation, starting with those involved in controlling the location of rolling stock.
2. All railways have developed and run automated information systems supplying data on freight operations.
3. Every engineer working in the field of signaling has to know the principles of track circuit operation.

**2. *Перепишите и переведите предложения, обращая внимание на перевод Participle 2.***

1. A number of trains operating on the line is determined depending on the system of control used.
2. The data obtained were transmitted to the central computer, which supplied all information required.
3. Applied to railways the electronic devices have facilitated many transportation processes.

**3. *Перепишите и переведите предложения, обращая внимание на перевод независимого причастного оборота.***

1. The signalman controlled his territory with the help of control console, the track diagram showing him the position of all points and signals.
2. In many parts of the world there is a demand for higher passenger train speed, serious efforts being made to design new signaling installations.
3. Resignalling on Italian Railways is called for by high speeds, centralized traffic control being introduced on truck lines.

**4. *Перепишите и переведите текст по специальности:***

**Optical input devices:**

A light pen detects differences in reflected light. It can be used for drawing directly on the monitor screen or for reading printed optical characters or barcodes.

A graphical tablet is used with a light pen for drawing. The users draw on the tablet with a light pen as if they were drawing on a sheet of paper.

A barcode reader is a special kind of light pen for reading barcodes. Barcodes are used to identify items for stock control and pricing.

A scanner is used to input text and graphics from a printed page.  
A digital camera is used to take pictures of an object. The picture is stored electronically and can be edited using a computer.

**Voice input device:**

A microphone is used to input sound.

**Контрольная работа № 4 (АТС, ИС)  
Вариант 5**

**1. *Перепишите и переведите предложения, обращая внимание на перевод Participle 1.***

1. Russian railway men, including managerial staff and scientists, face grand goals in fully meeting the needs of national economy.
2. All the laboratories are equipped with modern technical devices including analogue computing technique.
3. One signalman working at a signal box can control the territory of the whole junction.

**2. *Перепишите и переведите предложения, обращая внимание на перевод Participle 2.***

1. Special devices operated by push – buttons in the driver’s cab cause the doors to open and close automatically.
2. The car identification equipment adopted as standard by American Railroads was tested in Europe.
3. Car identification, performed by automatic systems is very important for high – speed train operation.

**3. *Перепишите и переведите предложения, обращая внимание на перевод независимого причастного оборота.***

1. On railways computers are used for planning trains movement, they being introduced into the CTC system.
2. The primary task of computers on railways is data collection, information being recorded and processed.
3. The principal part of the computer, its “brain”, is what is called “software”, here Russian scientists having made a contribution.

**4. *Перепишите и переведите текст по специальности:***

The electronic memory inside a computer is of limited capacity and can only hold data when the computer is switched on. A storage device is used to store data that is not being processed and to save data when the computer is switched off. There are a variety of storage devices and storage media available. These include magnetic devices (e.g. floppy disk drives, hard disk drives, tape drives), optical devices (e.g. CD-ROM drives), and magneto-optical drives.

Disks have to be treated with care if you do not want to damage them or the data stored on them. Damage can be caused by physical strain, dust, smoke particles, finger marks, sunlight, heat, and magnetism, depending on the type of media used. When in use, a disk rotates at high speed and a read/write head is brought very close to its surface. If the disk is removed when the drive is in use, the read/write head and the disk surface may be damaged. If extra labels are attached to the disk, it can very easily get stuck in the drive.

### **Контрольная работа № 4 (ЭПС, ЭНС, ЭСС) Вариант 1**

#### ***1. Перепишите и переведите предложения, обращая внимание на перевод Participle 1.***

1. While reconstructing the tunnel the engineers equipped it for a. c. (alternating current) electric traction.
2. Regenerative braking is used on lines carrying high – density traffic.
3. Railway electrification attracts the attention of transport engineers in the countries facing the energy crisis.

#### ***2. Перепишите и переведите предложения, обращая внимание на перевод Participle 2.***

1. The first method used in producing an electric current was chemical in nature.
2. In the course of his experiments, A. Volt developed the first electric battery, a device known as a voltaic pile.
3. Electronuclear machines more generally called particle accelerators, have played a vital role in the development of nuclear science and technology.

#### ***3. Перепишите и переведите предложения, обращая внимание на перевод независимого причастного оборота.***

1. The induction motor being a construct - field machine, the torque is directly proportional to the current.
2. Railways have to use different systems of control, the chopper control system being the most economical.
3. The advantages and disadvantages of the types of motive power having been discussed, we spoke in favor of the electric locomotives.

**4. *Перепишите и переведите текст по специальности:***

### **ATMOSPHERIC ELECTRICITY**

Electricity plays an important part in modern life. Therefore, finding new sources of electric energy is the most important problem that scientists and engineers try to solve. In this connection one might ask: "Is it possible to develop methods of harnessing lightning?" In other words, could atmospheric electricity be transformed into useful electricity? Beginning with, hundreds of millions of volts are required for a lightning spark about one and a half kilometer long. However, this does not represent very much energy because of the intervals between single thunderstorms. As for the power spent in producing lightning flashes all over the world, it is only about 1/10,000 of the power got by mankind from the sun, both in the form of light and that of heat. Thus, the source in question may interest only the scientists of the future. Benjamin Franklin began thinking that lightning was a strong spark of electricity, when studying the Leyden jar (for long years the only known condenser). He began experimenting in order to draw electricity from the clouds to the earth. On a stormy day Franklin and his son went into the country taking with them some necessary things such as: a kite with a long string, a key and so on. The key was connected to the lower end of the string. "If lightning is the same as electricity, then some of its sparks must come down the kite string to the key", he thought.

#### **Контрольная работа № 4 (ЭПС, ЭНС, ЭСС) Вариант 2**

**1. *Перепишите и переведите предложения, обращая внимание на перевод Participle 1.***

1. The locomotives hauling trains on mountainous railways usually operate on electric energy.
2. Any material substituting copper must have the current – carrying capacity.

3. While using the chopper control system the number of motor cars is smaller than with conventional control system.

**2. *Перепишите и переведите предложения, обращая внимание на перевод Participle 2.***

1. The appliance received required some improvement.
2. The amount of electricity generated depended on the quality of the coal.
3. The economies obtained by the use of electric traction are in the financial – economics plan.

**3. *Перепишите и переведите предложения, обращая внимание на перевод независимого причастного оборота.***

1. The electric power being of low voltage, the third rail system may be used.
2. The electric locomotive presents a much more perfect type of motive power, its efficiency being the highest.
3. The standard pressure for direct current system being too low, the transformers were used to raise it.

**4. *Перепишите и переведите текст по специальности:***

## **TRANSFORMERS**

A transformer is an electrical device by which the electromotive force of a source of alternating current may be increased or decreased. In other words, the transformer is a device for changing the electric current from one voltage to another. They are widespread in long distance power transmission as well as in telephone, radio transmitters and receivers, television, etc.

A simple transformer is a kind of induction coil. It is well known that in its usual form it has no moving parts. On the whole, it is not misused and is not damaged by lightning.

We may say that the principal parts of a transformer are two windings, that is coils, and an iron core. They call the coil, which is supplied with current the “primary winding”, or just “primary”, for short. The winding from which they take the current is referred to as “the secondary winding” or “secondary” for short. It is not new that the former is connected to the source of supply, the latter being connected to the load.

Nearly all transformers come under one of the following classes: step-up, and step-down transformers. When the number of turns of wire on the secondary is the same as the number of the primary, the secondary voltage is the same as the primary, and we get what is called a “one-to-one” transformer.



**Контрольная работа № 4 (ЭПС, ЭНС, ЭСС)  
Вариант 3**

**1. *Перепишите и переведите предложения, обращая внимание на перевод Participle 1.***

1. Electric trains can be driven from either end which reduces shunting movement at terminals.
2. Overhead construction is also adopted for continuous – current railways operating at voltage of 1 500 V, and above.
3. Working as a unit two motor cars can be operated by one engineman.

**2. *Перепишите и переведите предложения, обращая внимание на перевод Participle 2.***

1. Connected to electric traction railways will benefit fully from their ability.
2. The first source of continuous current constructed by Volt appeared in 1800.
3. The problem solved helped to increase the speed of the train.

**3. *Перепишите и переведите предложения, обращая внимание на перевод независимого причастного оборота.***

1. Electric trains accelerating two or three times quicker than steam trains, a higher average speed can be maintained.
2. The locomotive has a total weight of 80.5 tons, the weight of the electrical equipment being about 37 ton.
3. An object losing its potential energy, that energy is turned into kinetic energy.

**4. *Перепишите и переведите текст по специальности:***

**TRANSFORMERS**

There are two classes of transformers: step-up, and step-down transformers. When the number of turns of wire on the secondary winding is the same as the number of the primary winding, the secondary voltage is the same as the primary, and we get what is called a “one-to-one” transformer. In case, however, the number of turns on the secondary winding is greater than those on the primary, the output voltage is larger than the input voltage and the transformer is called a step-up transformer. On the other hand, the secondary turns being fewer in number than the primary, the transformer is known as a step-down transformer.

It is important to note that the device under consideration is practically indispensable in the transmission of electrical energy over wires for long distance. To avoid large heat losses, transformers at the power house step the voltage up to 220,000 volts before switching the current onto the power line. At the consumer's end of the line, a transformer substation steps the voltage down to something like its original value of 2,200 volts. From there branch lines distribute the power to various sections of the city where smaller transformers, one near each group of several houses, step it down again to the relatively safe voltage of 110 to 220 volts.

**Контрольная работа № 4 (ЭПС, ЭНС, ЭСС)  
Вариант 4**

**1. *Перепишите и переведите предложения, обращая внимание на перевод Participle 1.***

1. The single – phase system involves the use of the open-air transforming stations requiring no attendance.
2. Using the three – phase system makes it possible to make trains on descending grades, send energy back into the overhead wires for utilizing it by trains up the ascending grades.
3. The d. c. (direct current) system and a. c. (alternating current) system here being considered clearly show their advantages and disadvantages.

**2. *Перепишите и переведите предложения, обращая внимание на перевод Participle 2.***

1. There are many current systems adopted on the world-electrified railroads.
2. For very high potentials used on long distance transmission lines extra precautions as to insulation are required.
3. The advantage of the a. c. system lies in the high efficiency obtained.

**3. *Перепишите и переведите предложения, обращая внимание на перевод независимого причастного оборота.***

1. The source of the electric current having been discovered, many scientists began to experiment with it.
2. The secondary turns being fewer in number than the primary, the transformer is known as a step-down transformer.
3. The price per kilowatt - hour being 10 - 15 kopecks for the thermal stations and to 6 kopecks for the hydroelectric stations, the operating costs under electric traction will be lowered in the future.

#### **4. Перепишите и переведите текст по специальности:**

Most intercity electric trains receive power through an overhead wire called a catenary. In the overhead wire system, a steel framework connects a car, usually a locomotive, to a catenary. The framework, called a pantograph, delivers electric current from the wire to the locomotive's propulsion system. This system includes the traction motors. Traction motors power the driving wheels, which actually move the locomotive.

Intercity electric trains have one or more locomotives that pull freight or passenger cars. Most electric locomotives weigh between 100 and 200 short tons (90 and 180 metric tons) and provide about 6,000 to 7,000 horsepower (4,500 to 5,200 kilowatts). They can reach speeds of over 150 miles (240 kilometers) per hour.

An electrified third rail delivers electricity to most inter-urban trains. Trains using a third rail have metal plates called shoes. Two shoes attach to the bottom of a locomotive or railcar. The shoes slide along the third rail, delivering electric current to the car's propulsion system. Some inter-urban railcars have traction motors, which range from 119 to 282 horsepower (89 to 210 kilowatts). Others are driven by locomotives or by railcars that have traction motors.

### **Контрольная работа № 4 (ЭПС, ЭНС, ЭСС) Вариант 5**

#### **1. Перепишите и переведите предложения, обращая внимание на перевод *Participle 1*.**

1. The construction of power - stations operating on atomic fuel and generating electric current is quite necessary.
2. When placing an iron core within a solenoid, we obtain an electromagnet.
3. An electric current passing through a wire heats that wire.

#### **2. Перепишите и переведите предложения, обращая внимание на перевод *Participle 2*.**

1. When heated to a suitable temperature, a filament emits electrons.
2. It was recognized that a source of controlled high-energy particles in sufficient quantities would be extremely useful in nuclear experiments.
3. The graphite – uranium reactors will be installed in the deep concrete – faced wells.

**3. *Перепишите и переведите предложения, обращая внимание на перевод независимого причастного оборота.***

1. The conversion of railways to electric traction provides many advantages, the increase in speed and traffic capacity being one of them.
2. The amount of current passing through the motor windings determines the torque, the voltage determining the speed of rotation.
3. Trains becoming heavier and longer, high-output heavy-duty electric locomotives are to be used.

**4. *Перепишите и переведите текст по специальности:***

**HIGH-SPEED PANTOGRAPH ON BRITISH RAILWAYS**

The High-speed pantograph gives a much-improved performance while remaining relatively simple and economic. Simply to achieve a higher speed, the most attractive solutions appear to be either to incorporate a stitch at each support, fairly common in Europe, or to improve the pantograph.

In general, it can be said that an improved pantograph design allows any given type of overhead equipment to be used at higher speeds. Alternatively, a better pantograph allows use of a more basic design of overhead equipment to achieve an existing level of performance.

If trains require more than one pantograph in operation, an improvement in current collection performance can be more than usually significant. Not only does the leading pantograph impart fewer oscillations to the overhead system, the trailing pantographs are more easily able to follow the vibrations of the contact wire. Experiments with the BR-BW High-speed pantograph at the rear of electrically hauled train have indicated very satisfactory performance up to 170 km/h reached on test, and 200km/h two-pantograph operation appears feasible on MK III overhead with existing standards of current collection. If two pantographs are run very close together, they can produce a double uplift force in one span with consequent electrical clearance as well as dynamic problems.

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