Exercise 1

1. Who was the first physicist to describe the first machine for producing an electric charge?

The first machine for producing an electric charge was the German physicist Otto von Guericke.

1. What was the name of the first scientist who made clear the two different types of electric charge?

The French scientist Charles Fransois de Cisternay Du Fay was the first to make clear the two different types of electric charge.

1. Who proved the identity of the atmospheric electricity with the electrostatic charge on a Leyden jar?

Benjamin Franklin proved the identity of the atmospheric electricity with the electrostatic charge on a Leyden jar.

1. What is the British chemist Joseph Priesley is famous for?

The British chemist Joseph Priesley is famous for proved the law that the force between electric charges varies inversely with the square of the distance between the charges experimentally.

1. Who was responsible for the theory of electric lines of force?

Faraday was responsible for the theory of electric lines of force.

1. What kids of an experiment related to electric current did Italian physicists Luigi Galvani and Allesandro Volta conduct?

Galvani produced muscle contraction in the legs of frogs by applying an electric current to them. Volta announced the first artificial electrochemical source of potential difference, a form of electric battery.

1. Does the magnetic field exist around the electric current?

Magnetic field are exist around the electric current.

1. Who proved the fact of the magnetic field’s existence around the current?

The Danish scientist Hans Christian Oersted was proved the fact of the magnetic field’s existence around the current.

1. Do electric circuits obey the law of the conservation of energy?

Electric circuits obey the law of the conservation of energy and that electricity is a form of energy.

1. Who proved that the electricity is a form of energy?

James Prescott Joule and the German scientist Hermann Ludwig Ferdinand von Helmholtz was proved that the electricity is a form of energy.

1. What contributions to the study of electricity James Clerk Maxwell and Heidrik Rudolf Hertz did?

James Clerk Maxwell was investigated the properties of electromagnetic waves and light and developed the theory that the two are identical. Heinrich Rudolf Hertz was produced and detected electric waves in the atmosphere.

1. What are the names of American engineers and inventors who pioneered the widespread use of electricity as a source of power?

Thomas Alva Edison, Nikola Tesla, and Charles Proteus Steinmetz are the names of American engineers and inventors who pioneered the widespread use of electricity as a source of power.

     Exercise 2

     Электрический заряд - electric charge;  два различных типа - two different types;  положительный - positive;  отрицательный - negative;  эксперимент - experiment;  исследования в области электричества - electrical research;  атмосферное электричество - atmospheric electricity;  молния - lightning;  электростатический заряд - electrostatic charge;   избыток - excesses ;  недостаток - shortages;   сила - force;  квадрат расстояния - square of the distance; распределять - to distribute ;  измерять - measure;  наблюдения - observations;   теория электрических линий - theory of electric lines of force; искусственный - artificial;  электрохимический источник - electrochemical source;  электрические волны - electromagnetic waves;  теория электронов - electron theory;  основа современной электрической теории - basis of modern electrical theory.

     Exercise 3

1. The first machine for producing an electric charge was described by Otto von Guericke.
2. There are two different types of electric charge negative and positive
3. An electric charge distributes itself uniformly over the surface of hollow metal sphere.
4. A magnetic field exists around electric current flow.
5. Electric circuits obey the law of energy conservation.
6. The properties of electromagnetic waves and light are identical
7. The widespread use of electricity as a source of power is largely due to the work of Nicola Tesla, Thomas Edison.

Exercise 4

*Составьте предложения, используя данные слова и словосочетания:*

1. Different; charge; types; positive; negative.

Существуют два вида электрических зарядов: положительный и отрицательный.

1. Electricity; atmospheric; lightning; thunder; phenomena; causes.

Electricity and atmospheric phenomena, such as lightning and thunder, have specific causes.

1. Electric; distributes; charge; itself; surface; over the; uniformly.

Electric charge distributes itself uniformly over the surface.

1. Conduct; experiments; current; electric.

Conducting experiments with electric current is essential for understanding electricity.

1. Contributions; electricity; study; in 19th century.

The contributions to the study of electricity in the 19th century were significant.

1. Energy; electricity; form.

Energy exists in the form of electricity.

1. Modern; electrical theory; electron theory; basis.

Modern electrical theory is based on electron theory.

1. Source; power; use; widespread; electricity.

The sources of power for widespread use of electricity are diverse.

     Exercise 5

*Переведите на английский язык следующие предложения:*

1. Существуют два вида электрических зарядов: положительный и отрицательный.

There are two types of electric charges: positive and negative.

1. Его эксперименты доказали, что атмосферное электричество,  вызывающее феномен молнии и грома, идентично электростатическому заряду «лейденской банки».

His experiments proved that atmospheric electricity, which causes the phenomenon of lightning and thunder, is identical to the electrostatic charge of the "Leyden jar".

1. Сила между электрическими зарядами изменяется обратно пропорционально квадрату расстояния между зарядами.

The force between electric charges varies inversely proportional to the square of the distance between the charges.

1. Этот ученый внес большой вклад в развитие учения об электричестве.

This scientist made a great contribution to the development of the doctrine of electricity.

1. Электричество является формой энергии.

Electricity is a form of energy.

1. Электрические цепи подчиняются законам сохранения энергии.

Electrical circuits obey the laws of conservation of energy.

1. Свойства электромагнитных волн.

Electrical circuits obey the laws of conservation of energy.

1. Широкое применение электричества как источника энергии произошло в начале прошлого века.

The widespread use of electricity as an energy source occurred at the beginning of the last century.

**Exercise 1**

1. Do the charges neutralize each other if two equally and oppositely charged bodies are connected by a metallic conductor?

The charges neutralize each other if two equally and oppositely charged bodies are connected by a metallic conductor.

1. Is this neutralization accomplished by means of a flow of electrons or by any other mean?

 Neutralization is accomplished by means of a flow of electrons through the conductor.

1. In which direction electrons will flow in any continuous system of conductors?

In any continuous system of conductors, electrons will flow from the point of lowest potential to the point of highest potential.

1. How do we call the current if it flows continuously in one direction?

The current flowing in a circuit is described as direct current (DC) if it flows continuously in one direction.

1. How do we call the current if it flows alternately in either direction?

Alternating current (AC) if it flows alternately in either direction.

1. What is called as the electromotive force (emf) or voltage?

The first is the potential difference in the circuit, which is sometimes called the electromotive force (emf) or voltage.

1. What quantity is usually given in terms of the ampere?

Quantity is usually given in terms of the ampere is current flow.

1. How do we call the unit used for expressing the quantity of resistance?

The unit used for expressing the quantity of resistance is the ohm

1. What relationship is known as Ohm's law?

Which is defined as the amount of resistance that will limit the flow of current to 1 amp, in a circuit with a potential difference of 1 V.

1. What can be observed when an electric current flows through a wire?

When an electric current flows through a wire, two important effects can be observed: the temperature of the wire is raised, and a magnet or a compass needle placed near the wire will be deflected, tending to point in a direction perpendicular to the wire.

1. In what unit of measurement the amount of energy expended in an electric circuit is expressed?

The amount of energy expended in an electric circuit is expressed in terms of the joule.

     Exercise 2

     Противоположено заряженный - oppositely charged;  металлический проводник -  metallic conductor;  заряд - charge;  поток электронов - flow of electrons;  проводник - conductor;  электротехника - electrical engineering;  непрерывная система - continuous system;  низший потенциал - lowest potential;  высший потенциал - highest potential;  электрический ток - current flow;  ампер - ampere;  соответствовать - corresponds;  сопротивление - resistance;  обычные условия - ordinary conditions;  закон Ома - Ohm's law;  уравнение - equation;  формулировка - formulation;  температура проволоки -  temperature of the wire;  атомы - atoms;  измерять - expressed.

  Exercise 3

1. Metallic conductor; connected; neutralize; charged; bodies.

A metallic conductor is used to connect and neutralize charged bodies.

1. Electrical; engineering; current; electrical; opposite; positive; negative.

In electrical engineering, the current is characterized by positive and negative charges that are opposite to each other.

1. Flow; second; rate; current.

The flow of current can be measured in terms of the rate at which it passes through a second.

1. Limits; resistance; current; necessarily.

The limits of resistance do not necessarily restrict the flow of current.

1. Law; can be stated; equation; Ohm’s.

Ohm’s law can be stated using the equation \( V = I \ R ).

1. Collide; atoms; electrons; conductor; energy.

When electrons collide with atoms in a conductor, they transfer energy.

1. Joule; energy; amount; expended; circuit; electric.

The Joule is the unit of energy that represents the amount expended in an electric circuit.

1. Needle; compass; placed; deflected; magnet.

A needle compass placed near a magnet will be deflected due to the magnetic field.

   Exercise 4

*Переведите на английский язык следующие предложения:*

1. Равные и противоположено заряженные тела соединены между собой металлическим проводником.

Equal and oppositely charged bodies are connected to each other by a metal conductor.

1. Поток электронов от отрицательно заряженного тела к положительно заряженному телу.

Equal and oppositely charged bodies are connected to each other by a metal conductor.

1. Поток электронов от точки с низшим потенциалом к точке с высшим потенциалом.

The flow of electrons from a point with a lower potential to a point with a higher potential.

1. Сопротивление в сети  ограничивает величину тока.

The resistance in the network limits the amount of current.

1. Закон Ома можно выразить в виде следующего алгебраического уравнения.

Ohm's law can be expressed as the following algebraic equation.

1. При прохождении электрического тока по проводу, температура провода повышается.

When an electric current passes through the wire, the temperature of the wire rises.

1. При столкновении электронов тока с атомами проводника образуется энергия.

When current electrons collide with conductor atoms, energy is generated.

1. Стрелка компаса расположенного рядом с проводом будет отклоняться в направлении перпендикулярном проводу.

The compass needle located next to the wire will deviate in a direction perpendicular to the wire.