**Тема:**  «Вычисления по формуле. Напряжение»

**Цель:** Повторить грамматический материал , продолжить изучать лексическую тему «электротехника».

**Задачи:** Отработать навык работы (в т.ч. перевода) с профессиональной лексикой по теме «электричество», повторить тематический материал, актуализировать имеющиеся знания.

**Специальность:** 13.02.09 Монтаж эксплуатации линий электропередачи, 13.02.11 Техническая эксплуатация и обслуживание электрического и электромеханического оборудования (по отраслям)

**Время выполнения:** 180 минут

1. **Study the new words.**
2. **Read the text.**
3. **Do the tasks.**

**Glossary:**

electric potential

difference

electrical poles

consist of

force

accumulating

increases

reaches

respective poles

EMF

conducting wire

hence

terminal voltage

respective

**The main formulas of electrotechnics. Electrical voltage.**

***Electrical voltage*** is also called as electric potential and is defined as the electrical potential difference between two electrical poles of the battery during the flow of electric current.  
 Let us consider the example of a battery; battery consists of two electrical poles – positive and negative electrical pole. Chemical process taking places in battery results into chemical force or non-electrical force. Due to chemical force, positive charges move towards positive poles and negative charges move towards negative pole and get accumulated there. The process of accumulating charges at respective poles produces electrical potential difference between two poles and increases gradually. Once the electrical potential difference reaches the maximum and there is no further accumulation of charges at respective poles, at this time the electrical potential difference and chemical force becomes equal. The electrical potential difference at this point is called emf – electromotive force of the battery.  
The unit of emf is joule/coulomb = volt. The name is given in the memory of scientist Volta.  
Suppose we attach battery with a conducting wire, then the electric field is generated. Due to electric field, positive charges flow towards negative force and constitute an electric current. Hence the potential difference between two electrical poles is varying when the electric current is flowing. This electrical potential difference between two poles of the battery during the flow of current is called terminal voltage or electrical voltage or electrical potential.

1. **Answer the following questions:**
2. Electromotive force (EMF) is also known as \_\_\_\_\_\_\_\_\_\_\_\_\_.
3. Voltage is like gravity in which respect?
4. In order for a current to flow, there must be voltage and a \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_.
5. Resistance is the \_\_\_\_\_\_\_\_\_\_\_\_\_ to the flow of current.
6. Power is the \_\_\_\_\_\_\_ at which \_\_\_\_\_\_ is being done.  
     
   **2. Learn the rule**

**The relationship between voltage and emf is given as**  
V = E – I × r  
Where we have  
V= Voltage  
E = electromotive force  
I = current  
r = internal resistance  
  
The instrument used to measure the electric potential or electric voltage between any two points is called Voltmeter and is connected parallel to the two concerned points.  
  
**Calculation Examples**  
**Example-1:** The internal resistance of a 12V battery is 0.17 ohm when current flows form the battery is 0.1 x 104 mA; calculate the terminal voltage of the battery.  
  
**Reason:**  
Here we have:  
E = 12V  
r = 0.17 ohm  
I = 0.1 × 104 mA = 1000 mA = 1 A

**Solution:**  
V = E – Ir  
= 12 – (1 × 0.17)  
= 11.8 V  
  
**Example-2:** Why did not the positive charges move from positive pole to the negative pole of the battery prior to connecting with the conducting wire?  
a)  Positive charges faces opposition form internal resistance of the battery  
b)  Positive charges faces opposition from the non-electrical force  
c)  Energy of the positive charges becomes zero as soon as it reaches to positive charge  
d)  None of above  
  
**Example-3:**The instrument used for measuring the electric voltage is……………  
a)  Ammeter  
b)  Wheatstone bridge  
c)  Galvanometer  
d)  Voltmeter  
  
**3. Translate into Russian:**

Voltage, or electromotive force (EMF), is what causes electrons to flow through a conductor. It is a potential to push or pull the electrons away. from their binding atoms and produce electron drift, transferring energy in the process. Voltage is potential energy, and when it is used to produce electricity, the potential energy is converted to electrical energy. It’s similar to the potential energy present when you hold an object in the air. Gravity has the potential to pull the object to the earth, but it doesn’t fall unless you allow it to. The force of gravity is potential energy. If you let the object fall, then that potential energy is converted to kinetic energy while it is falling. By the same token, voltage has the potential to make electrons flow through a conductor. Unless there is a closed path along a conductive material through which the electrons can flow, there will be no current flow. But the potential is there.