St. Lawrence High School

A Jesuit Christian Minority Institution

Term : Pre – Test

Solution of Work Sheet – 16

Class – X | Subject – Physical Science | Date – 12.06.20

Chapter – Current Electricity | Topic – Oham's Law

Choose the correct option for the following questions. $1 \times 15 = 15$

1. According to Ohm's law –
   a. Current in a conductor is directly proportional to the resistance
   b. Current in a conductor is directly proportional to the potential
   c. Current in a conductor is directly proportional to the potential difference
   d. Current in a conductor is inversely proportional to the potential difference

   Ans: c. Current in a conductor is directly proportional to the potential difference
2. If a current of 5A flows through a conductor from one end at potential of 13 volt to the other end at potential 5 volt, then the resistance of the conductor is –
   a. $\frac{5}{8}\ \Omega$
   b. $40\ \Omega$
   c. $1.6\ \Omega$
   d. None of these

   Ans: c. $1.6\ \Omega$
3. If a conductor is heated to increase its temperature, then its resistance will –
   a. Increase
   b. Decrease
   c. Remain same as resistance does not depend on temperature
   d. First increase and then decrease

   Ans: a. Increase
4. If the potential difference is increased, then to maintain the current constant –
   a. Resistance of the conductor has to be increased
   b. Resistance of the conductor has to be decreased
   c. Resistance should be kept constant
   d. The area of cross section of the conductor should be increased

   Ans: a. Resistance of the conductor has to be increased
5. The resistance of a conducting slab depends on –
   a. Length of the conductor
   b. Area of cross section of the conductor
   c. Nature of the conductor
   d. All of these

   Ans: d. All of these
6. Resistivity of a conducting slab depends on –
   a. Length of the conductor
   b. Area of cross section of the conductor
   c. Nature of the conductor
   d. All of these

   Ans: c. Nature of the conductor

7. The SI unit of resistivity is –
   a. $\Omega.m$
   b. $\Omega.m^{-1}$
   c. $\Omega^{-1}.m$
   d. $\Omega^{-1}.m^{-1}$
   Ans: a. $\Omega.m$
8. The SI unit of conductivity is –
   a. $\Omega.m$
   b. $\Omega.m^{-1}$
   c. $\Omega^{-1}.m$
   d. $\Omega^{-1}.m^{-1}$
   Ans: d. $\Omega^{-1}.m^{-1}$
9. When a conductor of resistance $40\ \Omega$ is connected in between a potential difference, it is seen that the current through the conductor is $\frac{2}{5}$ ampere. The possible combination of potentials at the two ends of the conductor may be –
   a. 10volts , 2volts
   b. 15volts, 8volts
   c. 20volts, 16 volts
   d. 19volts, 3volts
   Ans: d. 19volts, 3volts
10. When a potential difference of 16volts is applied across a conductor for 1minute, it is seen that 6×10^{20} number of electrons has flowed in that time. What is the resistance of the conductor?
   a. $1\ \Omega$
   b. $1.6\ \Omega$
   c. $5\ \Omega$
   d. $10\ \Omega$
   Ans: $10\ \Omega$
11. A solid cylindrical conducting rod is stretched and its length becomes $n\ times$ of initial length. Its resistance will –
   a. Remain same
   b. Become $n\ times$
   c. Become $\frac{1}{n}$ times
   d. n^2 times.
   $Ans: d. n^2$ times.
12. The resistivity of a material is $\rho = \frac{A}{L}R$. If now, the length L is doubled and the area of cross section is made $\frac{1}{3}$ times (keeping temperature constant), then the resistivity will be –
   a. $\frac{1}{6}$ times
   b. 6 times
   c. $\frac{2}{3}$ times
   d. Will be unchanged
   Ans: d. Will be unchanged
13. For the same set of voltage and current values, if the voltage versus current graph is plotted for two resistances $20\ \Omega$ and 50Ω on the same graph paper (keeping temperature constant), then –
   a. V-I graph for $20\ \Omega$ will be steeper
   b. V-I graph for $50\ \Omega$ will be steeper
   c. The slope of both the graphs will be same
   d. Slope of one will be 5times that of the other one
   Ans: b. V-I graph for $50\ \Omega$ will be steeper

14. What amount of charge will flow through a conductor of resistance 17 Ω during 5minutes if the potentials at the two ends of the conductor are 100volt and 49volts ?
    a. 900 C
    b. 100 C
    c. 36 C
    d. 15 C
    Ans: a. 900 C
15. The conductivity of copper at 20℃ is $6 \times 10^7\ \Omega^{-1}.m^{-1}$. At this temperature, if a 42×10^4 m long copper wire has very small resistance as $7 \times 10^{-3}\Omega$, then the area of cross section of that copper wire is –
    a. $36 \times 10^{14}\ m^2$
    b. $10^{-8}\ m^2$
    c. $1m^2$
    d. $1.5m^2$
    Ans: c. $1m^2$

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