

REVISION TEST -06

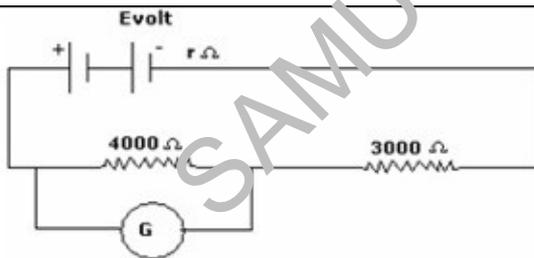
Total Marks -30

12th Physics - Current Electricity

Multiple Choice Questions

5x1 =5

- An ammeter together with an unknown resistance in series is connected across two identical batteries each of emf 1.5 V. When the batteries are connected in series, the galvanometer records a current of 1A and when the batteries are in parallel, the current is 0.6A. What is the internal resistance of each battery?
 - $\frac{1}{5} \Omega$
 - $\frac{1}{3} \Omega$
 - $\frac{1}{4} \Omega$
 - $\frac{1}{2} \Omega$
- The resistance of a metallic conductor increases due to
 - Change in dimensions of the conductor
 - Change in carrier density
 - Increase in the number of collisions between the carriers
 - Increase in the rate of collisions between the carriers and vibrating atoms of the conductor
- In the figure, when an ideal voltmeter is connected across 4000 ohm resistance, it reads 30 volts. If the voltmeter is connected across 3000 ohms resistance. It will read



- 22.5 volt
 - 40 volt
 - 35 volt
 - 20 volt
- The wire of the potentiometer has resistance 4 ohms and length 1 m. It is connected to a cell of e.m.f. 2 volts and internal resistance 1 ohm. The p.d. across the potentiometer wire is:
 - 1.2 V
 - 1.6 V

- c. 0.8 V
- d. 2.0 V

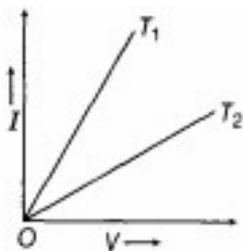
5. According to Kirchhoff's Loop Rule

- a. The absolute sum of changes in potential around any closed loop must be zero.
- b. The algebraic sum of changes in potential around any closed loop must be zero.
- c. The algebraic sum of changes in potential around any closed loop must be positive.
- d. The algebraic sum of changes in potential around any closed loop must be negative.

Short Type 1 Questions

1 x 2 = 8

- 6. Plot a graph showing a variation of current versus voltage for the material GaAs.
- 7. I-V graph for a metallic wire at two different temperatures T_1 and T_2 is as shown in the figure below. Which of the two temperature is lower and why?

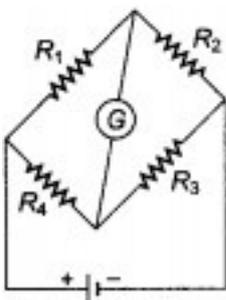


- 8. Two conducting wires X and Y of same diameter but different materials are joined in series across a battery. If the number density of electrons in X is twice that in Y, then find the ratio of drift velocity of electrons in the two wires.
- 9. The number density of free electrons in a copper conductor is $8.5 \times 10^{28} \text{ m}^{-3}$. How long does an electron take to drift from one end of a wire 3.0 m long to its other end? The area of cross section of the wire is $2.0 \times 10^{-6} \text{ m}^2$ and it is carrying a current of 3.0 A.

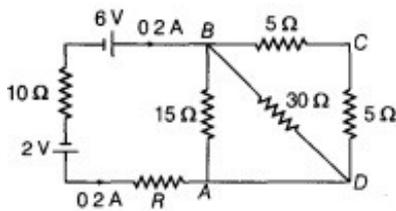
Short Type 2 Questions

3 x 3 = 9

- 10. For the circuit diagram of a Wheatstone bridge shown in the figure, use Kirchhoff's laws to obtain its balance condition.



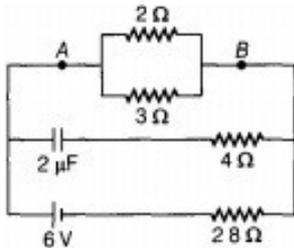
11. a. Three resistors 2Ω , 4Ω and 5Ω are combined in parallel. What is the total resistance of the combination?
- b. If the combination is connected to a battery of emf 20 V and negligible internal resistance, determine the current through each resistor, and the total current drawn from the battery?
12. Calculate the value of the resistance R in the circuit shown in the figure, so that the current in the circuit is 0.2 A . What would be the potential difference between points A and B ?



Long Type Questions

2 x 4 = 8

13. Calculate the steady current through the 2Ω resistor in the circuit shown in the figure.



14. A wire of resistance 8Ω is bent in the form of a circle. What is the effective resistance between the ends of a diameter AB ?

