ETERNAL CAREER CLASSES

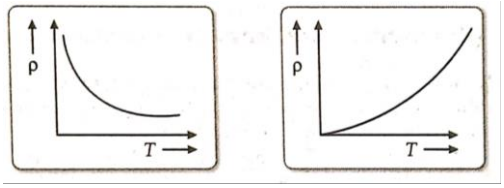
SUBJECT : PHYSICS | CLASS : XII | FULL MARKS : 20

NAME : …….. | BOARD TEST : 08 | DATE : 12.12.2024

SECTION - A

Single answer type question. Attempt any seven question :- **Marks : 1**× 7 = 7

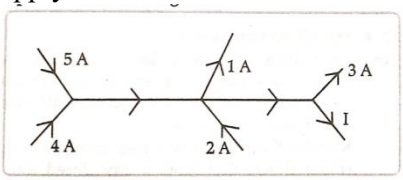
1. The temperature (T) dependence of resistivity of materials A and material B is represented by fig (i) and fig (ii) respectively . identify material A and material B .



(a) material A is copper and material B is germanium
(b) material A is germanium and material B is copper
(c) material A is nichrome and material B is germanium
(d) material A is copper and material B is nichrome

2. We use alloys for making standard resistors because they have :
(a) low temperature coefficient of resistivity and high specific resistance
(b) high temperature coefficient of resistivity and low specific resistance
(c) low temperature coefficient of resistivity and low specific resistance .
(d) high temperature coefficient of resistivity and high specific resistance .

3. Apply Kirchhoff's rule to find the current I in the part of the following circuit .



(a) 5 A (b) 3 A (c) 7 A (d) 1 A

4. Wheatstone bridge is not suitable for measurement of
(a) Very high value resistance
(b) Very low value resistance
(c) Both (A) and (B)
(d) Medium value resistances

5. A cell of emf E is connected across an external resistance R. When current 'T' is drawn from the cell, the potential difference across the electrodes of the cell drops to V. The internal resistance 'r' of the cell is
(a) $\left(\frac{E-V}{E}\right)$ R (b) $\left(\frac{E-V}{E}\right)$
(c) $\frac{(E-V)R}{1}$ (d) $\left(\frac{E-V}{V}\right)R$

6. Kirchhoff's first rule $\sum I = 0$ and second rule $\sum IR = \sum E$ (where the symbols have their usual meanings)are respectively based on :
(a) conservation of momentum and conservation of charge
(b)conservation of energy, conservation of charge
(c) conservation of charge, conservation of momentum
(d) conservation of charge, conservation of energy

7. In a dc circuit the direction of current inside the battery and outside the battery respectively are :
(a) positive to negative terminal and negative to positive terminal
(b) positive to negative terminal and positive to negative terminal
(c) negative to positive terminal and positive to negative terminal

(d) negative to positive terminal and negative to positive terminal

8. A car battery is charged by a 12 V supply, and energy stored in it is 7.20×10^5 J. The charge passed through the battery is :
   (a) 6.0×10^4 C
   (b) 5.8×10^3 J
   (c) 8.64×10^6 J
   (d) 1.6×10^5 C
9. Which of the following has negative temperature coefficient of resistivity ?
   (a) metal (b) metal and semiconductor
   (c) semiconductor (d) metal and alloy
10. An electric current is passed through a circuit containing two wires of same material, connected in parallel. If the lengths and radii of the wires are in the ratio of 3 : 2 and 2 : 3 , then the ratio of the current passing through the wire will be ?
    (a) 2 : 3
    (b) 3 : 2
    (c) 8 : 27
    (d) 27 : 8

SECTION - B

Short answer type question. Attempt any one question :- **Marks : 1**× 3 = 3

11. A variable resistor R is connected across a cell of emf E and internal resistance r.
    (a) Draw the circular diagram
    (b) Plot the graph showing variation of potential drop across R as function of R .
    (c) At what value of R current in circuit will be maximum
12. Define current density and relaxation time. Derive and expression for resistivity of a conductor in terms of number density of charge carriers in the conductor and relaxation time .

Long answer type question. Attempt any two question :- **Marks : 2** × 5 = 10

13. (a) state the two Kirchhoff's rules used in the analysis of electric circuits and explain them.
    (b) Derive the equation of the balanced state in a Wheats tone bridge using Kirchhoff's laws .
14. (i) A cell emf of (E) and internal resistance (r) is connected across a variable load resistance (R). Draw plots showing the variation of terminal voltage V with (i) R and (ii) the current (I) in the load .
    (ii) three cells, each of emf E but internal resistances 2r, 3r and 6r are connected in parallel across a resistor R.
    Obtain expressions for (i) current flowing in the circuit, and (ii) the terminal potential difference across the equivalent cell.
15. A room AC runs for 5 hours a day at a voltage of 220 V. The wiring of the room consists of Cu of 1 mm radius and a length of 10 m . Power consumption per day is 10 commercial units. What fraction of it goes in the joule heating in wires ? What would happen if the wiring is made of aluminium of the same dimensions ?

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