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AZIMABAD, BALASORE



WEEKLY TEST CHAPTER 3 TEST 1

CLASS: XII

SUBJECT: PHYSICS

FM: 20

TIME: 45 MIN

(1 MARK)

- The no of electrons flowing per second is 3.3×10^{19} . The current flowing through the conductor is
a. 2.0 b. 3.4 c. 4.8 d. 5.3
- The ratio of current density and electric field is
a. resistivity b. conductivity c. drift velocity d. mobility
- electron drift with speed V_d in a conductor with potential difference V across its ends. If V is reduced to $V/2$, their drift speed will become
a. $V_d/2$ b. V_d c. $2 V_d$ d. $4 V_d$
- A steady current I is passed through a conductor at room temperature for time t . it is observed that its temperature rises by 0.5°C . if $2I$ current is passed through the conductor for the same duration, the rise in its temperature will be approximately
a. 1.0°C b. 1.5°C c. 2.0°C d. 4.0°C
- Which of the following is the correct relation
a. $E = J\sigma$ b. $E = V_d/\mu$ c. $E = qF$ d. none
- Charge flowing through a conductor is given as $q = 3t^2 + 3t$ C. find the current flowing in the circuit at $t = 2$ sec. **(2 MARKS)**
- What is meant by relaxation time? Show that resistance of a conductor is expressed as $R = ml / ne^2 A \tau$. **(2MARKS)**
- Derive expression for drift velocity of electrons in a conductor. **(3 MARKS)**
- Explain how temperature do change resistance of a conductor. Find the temperature at which the resistance of a conductor increases by 25% of its value at 27°C . the temperature coefficient of resistance is $2 \times 10^{-4} ^\circ\text{C}^{-1}$. **(3 MARKS)**

OR

What is current density? Derive the relation between current density, electric field and conductivity.

10. (5 MARKS)

- Express current in terms of drift velocity.
- A wire of length l and area of cross section A is connected to a 12V battery such that 2 A of current is flowing in it. If the length is doubled and area is halved then what amount of current will flow when connected to same battery.