Physics

Reg.No. :

I.Answer all the Questions.

II.Use blue pen only.

Time : 01:30:00 Hrs

Total Marks : 40

Section-A

5 x 1 = 5

1) According to Ampere's circuital law the line integral for a closed curve of a magnetic field depends on

    (a) Permiability of free space   (b) The current flowing through the closed path   (c) (a) is wrong (b) is correct   (d) Both (a) and (b) are correct

2) According to end rule, when we see from one end of solenoid if the current flows in .... direction, then

    (a) clokwise; the nearer end is south pole   (b) clock wise; the nearer end is north pole   (c) anticlockwise; the nearer end is south pole   (d) both (b) & (c)

3) Calculate the resistance of the filament of a 100 W, 200 V electric bulb

    (a) 480Ω (b) 482Ω (c) 484Ω (d) 400Ω

4) The temperature of cold junction of a thermocouple is 20° C and temperature of inversion is 723 K, then the neutral temperature is

    (a) 235°C   (b) 372.5^{o}C   (c) 351.5K   (d) 713k

5) The magnetic field at a point at a distance 10 cm from the straight long conductor carrying current 4 A is

    (a) 40 T   (b) 2.5x10^{-5} T   (c) 8x10^{-6} T   (d) 2πx10^{-3}T

Section-B

5 x 3 = 15

6) A water heater is marked 5oo W, 220 V. If the voltage drops to 180 V, calculate the power consumed by the heater.

7) A solenoid is 2m long and 3 cm in diameter. It has 5 layers of windings of 1000 turns each and carries a current of 5 A. Find the magnetic indudction at its centre along its axis

8) A long solenoid of length 3 m has 4000 turns. Find the current through the solenoid if the magnetic field produced at the centreof the solenoid along its axisis $8 X 10^{-3} T$.

9) A current of 4 A flows through 5 turns coil of a tangent galvanometer having a diameer of 30 cm. If the horizontal component of Earth's magnetic induction is 30 cm $4 X 10^{-5} T$, find the deflection produced in the coil.

10) In a tangent galvanometer, a current of 1 A produces a deflection of 30^0. Find the current required to produce a deflection of 60^0.

Section-C

4 x 5 = 20

11) A circular coil of 200 turns and of radius 20cm carries a current of 5A. Calculate the magnetic induction at apoint along its axis, at a distance three times the radius of the coil from its centre.

12) A rectangular coil of area $20cm \times 10cm$ with 100 turns of wire is suspended in a radial magnetic field of induction $5 \times 10^{-3} T$. If the galvanometer shows an angular deflection of 15° for a current of 1mA, find the torsional constant of the suspension wire.

13) A moving coil galvanometer of resistance 20Ω produces full scale deflection for a current of 50 mA. How you convert the galvanometer into (i) an ammeter of range 20 A and (ii) a voltmeter of range 120 V.

14) a)   The deflection of a galvanometer falls from 50 divisions to 10 division when 12Ωresistance is connected across the galvanometer. Calculate the galvanometer resistance.

(OR)

    b)   In a hydrogen atom electron moves in an orbit o radius 0.5 A making 10^{16} revolutions per sercond. Determine the magnetic moment asscoiated with orbital motion of the electron. (Given e = 1.6 $\times 10^{-19}$ C)

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