

Model Question Paper
Effects of Electric Current - Part I

12th Standard

Physics

Reg.No. :

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I. Answer all the Questions.

II. Use blue pen only.

Time : 01:00:00 Hrs

Total Marks : 67

5 x 1 = 5

Section-A

- 1) Joule's law of heating is
(a) $H = \frac{I^2}{R}t$ (b) $H = V^2Rt$ (c) $H = VIt$ (d) $H = IR^2t$
- 2) Nichrome wire is used as the heating element because it has
(a) low specific resistance (b) low melting point (c) high specific resistance (d) high conductivity
- 3) peltier coefficient at a junction of a thermocouple depends on
(a) the current in the thermocouple (b) the time for which current flows (c) the temperature of the junction (d) the charge that passes through the thermocouple
- 4) In a thermocouple, the temperature of the cold junction is 20°C , the neutral temperature is 270°C . The temperature of inversion is
(a) 520°C (b) 540°C (c) 500°C (d) 510°C
- 5) Which of the following equations represents Biot-savart law?
(a) $dB = \frac{\mu_0}{4\pi} \frac{IdI}{r^2}$ (b) $\vec{dB} = \frac{\mu_0}{4\pi} \frac{IdI \sin \theta}{r^2}$ (c) $\vec{dB} = \frac{\mu_0}{4\pi} \frac{Id\vec{l} \times \vec{r}}{r^2}$ (d) $\vec{dB} = \frac{\mu_0}{4\pi} \frac{Id\vec{l} \times \vec{r}}{r^3}$

Section-B

4 x 3 = 12

- 6) state Joule's law
- 7) Define peltier coefficient
- 8) Define thomson coefficient
- 9) State Biot- savart law

Section-C

4 x 5 = 20

- 10) Applying Amperes circuital law, find the magnetic induction due to a straight solenoid.
- 11) Explain Thomson effect.
- 12) State and explain Biot-Savart law.
- 13) What are the special features of magnetic Lorentz force?

Section-D

3 x 10 = 30

- 14) State Joule's law. Explain Joule's calorimeter experiment to verify Joule's law of heating.
- 15) Obtain an expression for the magnetic induction at a point due to an infinitely long straight conductor carrying current.
- 16) Deduce the relation for the magnetic induction at a point along the axis of a circular coil carrying current.
