



B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
A CBSE DAY-CUM-BOYS' RESIDENTIAL SCHOOL

PERIODIC TEST-1 2025-26

PHYSICS

MARKING SCHEME (SET-2)

Class: XII

Date: 10.06.26

Time: 1hr

Max Marks: 25

Section A

1. (c) 1.92×10^{20}
2. (b) Opposite to conventional current
3. (b) Tesla
4. (b) Zero
5. (c) Both experience same force

Section B

6. Copper preferred because:
Low resistivity $\rightarrow$ less power loss
High ductility $\rightarrow$ easy to draw into wires
Does not corrode easily
- 7.

$$\begin{aligned}E_{net} &= 10 - 6 = 4V \\R_{total} &= 2 + 4 = 4\Omega \\I &= \frac{E}{R} = \frac{4}{4} = 1A\end{aligned}$$

8.

$$F = \frac{\mu_0 I_1 I_2}{2\pi r}$$

"One ampere of current is the value of steady current, which when maintained in each of the two very long, straight, parallel conductors of negligible cross-section; and placed one metre apart in vacuum, would produce on each of these conductors a force of equal to 2×10^{-7} newtons per metre (Nm^{-1}) of length."

9. **Trajectory:**

Positive charge $\rightarrow$ curves in one direction (right-hand rule)
Negative charge $\rightarrow$ curves in opposite direction
Path is circular

SECTION-C

10.

$$(i) \quad S = \frac{RAig}{i-ig} = 2/8 = 0.25\Omega$$

$$(ii) \quad R_{eff} = \frac{r \times G}{r+G} = 0.25 / 1.25 = 0.2 \Omega$$

11. Using Ampere's law:

$$= \mu_0 nI \text{ (where } n=N/l \text{)}$$

12. Drift velocity comparison

Drift velocity:

$$v_d = nqAI$$

(i) Series:

Same current flows

$$v_d \propto A I$$

Areas ratio = 3:1

$$v_1:v_2=1:3$$

(ii) Parallel:

Same potential difference

$$I \propto A \Rightarrow v_d = \text{same}$$

$$v_1=v_2$$

13.

Apply Kirchhoff's rules:

KCL at node P:

$$I_1 + I_2 = I_3$$

Loop PRSP:

$$20I_3 + 200I_2 + 5 = 0$$

Loop PRQP:

$$20I_3 + 60I_1 + 4 = 0$$

Substitute $I_3 = I_1 + I_2$:

$$20I_1 + 220I_2 = -5$$

$$80I_1 + 20I_2 = -4$$

$$I_2 = -0.0186 \text{ A} \approx -18.6 \text{ mA}$$

$$I_1 = -0.0454 \text{ A} \approx -45.4 \text{ mA}$$

$$I_3 = -0.064 \text{ A} \approx -64 \text{ mA}$$

(Negative sign $\Rightarrow$ actual direction is opposite to assumed.)