

Series-A

Roll No.....

Total No. of Questions-27] [Total No. of Printed Pages-16

A-854-A-XII-2325

PHYSICS **(Theory)**

Time Allowed—3 Hours Maximum Marks—60

Candidates are required to give their answers in their own words as far as practicable.

Marks allotted to each question are indicated against it.

Special Instructions :

- (i) You must write Question Paper Series in the circle at top left side of title page of your Answer-book.

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- (ii) While answering your Questions, you **must** indicate on your Answer-book the **same** Question No. as appears in your Question Paper.
- (iii) Do not leave blank page/pages in your Answer-book.
- (iv) All questions are compulsory.
- (v) The question paper has 27 questions. **All** the questions are compulsory. The Internal choice is given where applicable.
- (vi) Answers should be brief and to the point.
- (vii) Question Nos. 1 to 12 are MCQ (Multiple Choice Questions) carrying 1 mark each. Question Nos. 13 to 16 are very short answer type questions carrying 2 marks each. Question Nos. 17 to 23 are short answer type questions carrying 3 marks each and Question Nos. 24 carries 4 marks and Question Nos. 25 to 27 carry 5 marks each.

- (viii) There is no negative marking.
- (ix) All questions given in Section–A (Multiple Choice Questions) are to be attempt on OMR sheet provided with Answer book.
- (x) You may use the following values of physical constants where ever necessary :
- i) $c = 3 \times 10^8 \text{ ms}^{-1}$.
 - ii) $m_e = 9.1 \times 10^{-31} \text{ kg}$.
 - iii) $e = 1.6 \times 10^{-19} \text{ C}$.
 - iv) $\mu_0 = 4\pi \times 10^{-7} \text{ Tm A}^{-1}$.
 - v) $h = 6.63 \times 10^{-34} \text{ JS}$.
 - vi) $\epsilon_0 = 8.854 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$.
 - vii) Avogadro number = 6.023×10^{23} per gram mole.

SECTION-A

(Multiple Choice Questions)

1. The SI unit of electric flux is : 1
- (a) $\text{Nm}^2 \text{C}^{-2}$
 - (b) $\text{NC}^{-1} \text{m}^2$
 - (c) $\text{CN}^2 \text{m}^{-1}$
 - (d) $\text{C}^2 \text{N}^{-1} \text{m}^{-2}$.
2. Kirchhoff's junction rule is reflection of : 1
- (a) conservation of current density vector.
 - (b) the fact that the momentum with which a charged particle approaches a junction is unchanged as the charge particle leaves the junction. •
 - (c) conservation of charge and the fact that there is no accumulation of charges at a junction.
 - (d) None of the above.

3. Biot-Savart law indicates that the moving electrons (velocity $\vec{v}$) produce a magnetic field $\vec{B}$ such that : 1

(a) $\vec{B} \parallel \vec{v}$

(b) It obey inverse cube law

(c) It is along the line joining the electron and point of observation

(d) $\vec{B} \perp \vec{v}$.

4. A transformer has 400 secondary turns and 500 primary turns. If the secondary voltage is 400 V, the primary voltage is : 1

(a) 500V

(b) 400V

(c) 1000V

(d) 800V.

5. The magnetic flux linked with a Coil is given by $\phi = 5t^2 + 3t + 16$, where ϕ is in Weber and t is seconds. The induced e.m.f. in the Coil at $t = 5s$ will be :

1

(a) 6 volt

(b) 10 volt

(c) 53 volt

(d) 43 volt.

6. In Sunglasses and 3D movie cameras, polaroids are used to control :

1

(a) frequency of light

(b) intensity of light

(c) wavelength of light

(d) both (a) and (b).

7. The tangent of the angle by which it converges or diverges a beam of light parallel to the principle axis falling at unit distance from optical centre is called :

1

(a) Malus law

- (b) Lens formula
- (c) Power of a lens
- (d) Snell's law.

8. The minimum energy needed by an electron to escape from the metal surface is called :

- (a) potential difference
- (b) work function
- (c) gravitational potential energy
- (d) momentum.

1

9. Heavy stable nuclei have more neutrons than protons. This because of the fact that : 1

- (a) neutrons are heavier than protons
- (b) electrostatic force between protons are repulsive
- (c) neutrons decay into protons through beta decay
- (d) nuclear forces between neutrons are weaker than that between protons.

10. When a junction diode is reverse biased, the flow of current across the junction is mainly due to : 1

- (a) diffusion of charges
- (b) depends on the nature of material
- (c) drift of charges
- (d) both drift and diffusion of charges.

11. Assertion : The turns of a spring come close to each other, when current is passed through it.

Reason : It is because, the turns of a spring carry current in same direction and hence attract each other.

- (a) If both assertion and reason are true-and reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not a correct explanation of assertion.

