

Series-B

Roll No.....

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

A-854-B-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.

D-A-854-Series-B

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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. Dimensions of absolute permittivity of free space (ϵ_0) is : 1
- (a) $M^{-1} L^{-3} T^4 A^2$
- (b) $M^1 L^3 T^{-4} A^{-2}$
- (c) $M L^{-3} T^{-4} A^2$
- (d) $M^{-1} L^3 T^{-4} A^2$
2. Three Copper wires of lengths and cross-sectional areas are (l, A) , $(2l, A/2)$ and $(l/2, 2A)$. The resistance is minimum in : 1
- (a) wire of cross-sectional area $A/2$.
- (b) wire of cross-sectional area A .
- (c) wire of cross-sectional area $2A$.
- (d) same in all the three cases.
3. Antiparallel currents in two long parallel conductors are : 1
- (a) attract each other

(b) repel each other

(c) neither attract nor repel each other

(d) attract and repel each other.

4. A $15.0 \mu\text{F}$ capacitor is connected to a 220 V, 50 Hz source. The capacitive reactance will be : 1

(a) 222Ω

(b) 232Ω

(c) 212Ω

(d) 242Ω .

5. Lenz's law is the consequence of the law of conservation of : 1

(a) charge

(b) momentum

(c) mass

(d) energy.

6. Unpolarised light of intensity (I_0) passes through a single polaroid, the intensity of polarised light approximately is :

1

(a) I_0

(b) $2 I_0$

(c) $\frac{I_0}{4}$

(d) $\frac{I_0}{2}$

7. An optician prescribes a corrective lens of power +2.5 D, then focal length of a convex lens is :

(a) +40 cm

(b) -40 cm

(c) +20 cm

(d) -20 cm.

1

8. In an experiment on photoelectric effect, the slope of cut-off voltage versus frequency of incident light is found to be 4.12×10^{-15} Vs. The value of Planck's constant is :

(a) 8.24×10^{-34} Js

(b) 13.18×10^{-34} Js

(c) 3.29×10^{-34} Js

(d) 6.59×10^{-34} Js.

1

9. Outside a nucleus :

1

(a) neutron is stable

(b) proton and neutron are stable

(c) neutron is unstable

(d) neither neutron nor proton is stable.

10. Trivalent acceptor atom doped in Tetravalent Lattice forms which type of semiconductor : 1

(a) p-type semiconductor

(b) n-type semiconductor

(c) Intrinsic semiconductor

(d) p-n semiconductor.

11. Assertion : A charge, whether stationary or in motion, produces a magnetic field.

Reason : Moving charges produce only electric field in the surrounding space.

(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.

(c) Assertion is true but reason is false.

(d) Both assertion and reason are false. 1

12. Assertion : Diodes can be used for rectifying an AC voltage.

Reason : A rectifier is used to convert alternating current into direct current.