

Series-C

Roll No.....

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

A-854-C-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-C

P. T. O.

- (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. Torque acting on an electric dipole moment $\vec{P}$ placed in uniform electric field $\vec{E}$ is : 1

(a) $\vec{P} \cdot \vec{E}$

(b) PE

☒ (c) $\vec{P} \times \vec{E}$

(d) None of the above.

☒ 2. Which of the following characteristics of electrons determine the current in a conductor?

☒ (a) Drift velocity alone.

(b) Thermal velocity alone.

(c) Both drift velocity and Thermal velocity.

☒ (d) Neither drift nor Thermal velocity. 1

☒ 3. The direction of force experienced by a current carrying conductor placed in a magnetic field is given by : 1

(a) Lenz's Rule.

(b) ~~Fleming~~ Fleming left hand rule.

(c) Fleming right hand rule.

(d) Screw rule.

4. Electrical energy is transmitted over large distances at high alternating voltages. Which of the following statements is not correct? 1

(a) For a given power level, there is a lower current.

(b) Transmission lines can be made thinner.

(c) Lower current implies less power loss.

(d) It is easy to reduce the voltage at receiving end using step-down transformers.

5. The mutual inductance M_{12} of coil 1 with respect to coil 2 : 1

(a) increases when they are brought nearer and is same as M_{21} of coil 2 with respect to coil 1.

(b) depends on current passing through the coils.

(c) increases when one of them is rotated about an axis.

(d) Both (b) and (c) are correct

6. When a Polaroid is rotated, the intensity of light varies but never reduces to zero? It shows that the incident light is :

(a) partially plane polarised

(b) completely polarised

(c) unpolarised

(d) None of the above.

7. An optician prescribes a corrective lens of power - 4.0 D, then focal length of a concave lens is

(a) +40 cm

(b) 25 cm

(c) +20 cm

(d) -30 cm.

1

8. The de-Broglie wavelength of a ball of mass 0.12 kg moving with a speed of 20 ms^{-1} is : 1

(a) $2.76 \times 10^{-34} \text{ m}$

(b) $1.53 \times 10^{-34} \text{ m}$

(c) $6.63 \times 10^{-34} \text{ m}$

(d) $1.47 \times 10^{-34} \text{ m}.$

9. An atom bomb works on the principle of : 1

(a) α -decay

(b) β - decay

~~(c)~~ nuclear fission

(d) nuclear fusion.

10. Thickness of depletion region is of the order of one-tenth of : 1

(a) an angstrom

(b) millimeter

D-A-854-Series-C

(c) micrometer

(d) centimeter.

11. Assertion : Magnetic force is always perpendicular to the magnetic field.

Reason : Electric force is along the direction of electric field.

(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 : The energy gap between the valence band and conduction band is greater in silicon than in germanium.

