

SUBJECT: PHYSICS
CLASS : XII

MAX. MARKS : 70
DURATION : 3 HRS

General Instruction:

- (i) All questions are compulsory. There are 27 questions in all.
- (ii) This question paper has four sections : Section A, Section B, Section C and Section D.
- (iii) Section A contains five questions of one mark each, Section B contains seven questions of two marks each, Section C contains twelve questions of three marks each and Section D contains three questions of five marks each.
- (iv) There is no overall choice. However, an internal choice has been provided in one question of two marks, one question of three marks and all the three questions of five marks weightage. You have to attempt only one of the choices in such questions.
- (v) You may use the following values of physical constants wherever necessary :

$$c = 3 \times 10^8 \text{ m/s}, \quad h = 6.63 \times 10^{-34} \text{ Js}, \quad e = 1.6 \times 10^{-19} \text{ C}, \quad \mu_0 = 4\pi \times 10^{-7} \text{ TmA}^{-1},$$

$$\epsilon_0 = 8.854 \times 10^{-12} \text{ C}^2 \text{N}^{-1} \text{m}^{-2}, \quad m_e = 9.1 \times 10^{-31} \text{ kg}, \quad \frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ Nm}^2 \text{C}^{-2},$$

$$\text{Mass of neutron} = 1.675 \times 10^{-27} \text{ kg},$$

$$\text{Mass of proton} = 1.673 \times 10^{-27} \text{ kg},$$

$$\text{Avogadro's number} = 6.023 \times 10^{23} \text{ per gram mole}, \quad \text{Boltzmann constant} = 1.38 \times 10^{-23} \text{ JK}^{-1}$$

SECTION – A

Questions 1 to 5 carry 1 mark each.

1. Draw a graph to show a variation of resistance of a metal wire as a function of its diameter keeping its length and material constant.
2. A charge 'q' is moved from a point A above a dipole of dipole moment 'p' to a point B below the dipole in equatorial plane without acceleration. Find the work done in the process.



3. Why is the use of AC voltage preferred over DC voltage? Give two reasons.
4. A concave lens of refractive index 1.5 is immersed in a medium of refractive index 1.65. What is nature shown by lens?
5. Name the essential components of a communication system.

SECTION – B

Questions 6 to 12 carry 2 marks each.

6. An α -particle and a proton are accelerated through the same potential difference. Calculate the ratio of linear momenta acquired by the two.

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