



CBSE Guess Paper

CLASS 12

PHYSICS

Unit 1 Test – ELECTRIC CHARGES AND FIELDS

Total Marks: 30 Marks

Total Time: 1.5 hrs

SECTION A

5 x 1 = 5

1. Which orientation of an electric dipole in a uniform electric field would correspond stable equilibrium?
2. Define electric dipole moment. Write its S.I. unit.
3. A charge 'q' is placed at the center of a cube of side l. What is the electric flux passing through each face of the cube?
4. Two charges of magnitudes -2Q and + Q are located at points (a, 0) and (4a, 0) respectively. What is the electric flux due to these charges through a sphere of radius '3a' with its center at the origin?
5. What is the force between two small charges of 2×10^{-7} C placed 30 cm apart in air?

SECTION B

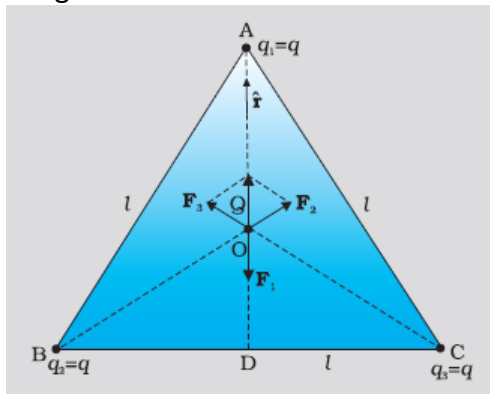
3 x 2 = 6

6. A system has two charges $q_A = 2.5 \times 10^{-7}$ C and $q_B = -2.5 \times 10^{-7}$ C located at points A: (0, 0, -15 cm) and B: (0,0, +15 cm), respectively. What are the total charge and electric dipole moment of the system?
7. Consider a uniform electric field $E = 3 \times 10^3 \hat{i}$ N/C. (a) What is the flux of this field through a square of 10 cm on a side whose plane is parallel to the yz plane?
8. Discuss force between two point charges through coulomb's law.

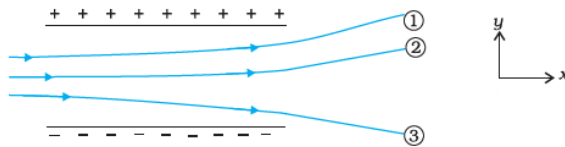
SECTION C

3 x 3 = 9

9. Consider three charges q_1, q_2, q_3 each equal to q at the vertices of an equilateral triangle of side l . What is the force on a charge Q (with the same sign as q) placed at the centroid of the triangle, as shown in the Figure



10. Shows tracks of three charged particles in a uniform electrostatic field. Give the signs of the three charges. Which particle has the highest charge to mass ratio?

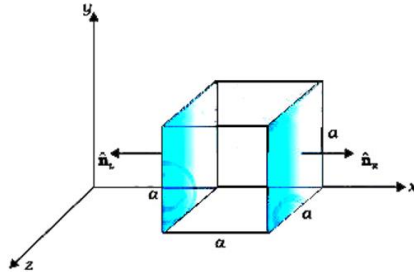


11. A point charge of $2.0 \mu\text{C}$ is at the centre of a cubic Gaussian surface 9.0 cm on edge. What is the net electric flux through the surface?

SECTION D

5 x 2 = 10

12. The electric field components in Fig. 1.27 are $E_x = \alpha x^{1/2}$, $E_y = E_z = 0$, in which $\alpha = 800 \text{ N/C m}^{1/2}$. Calculate (a) the flux through the cube, and (b) the charge within the cube. Assume that $a = 0.1 \text{ m}$.



13. Discuss the field of an electric dipole

- i) For points on the axis
- ii) For points on the equatorial plane

All the best