

HOLIDAY HOME WORK

CLASS – XII (PHYSICS)

Q 1 State Gauss' law in electrostatics. Using this law derive an expression for the electric field due to a uniformly charged infinite plane sheet.

Q 2 An electric dipole of dipole moment p is placed in a uniform electric field E . Obtain the expression for the torque τ experienced by the dipole. Identify two pairs of perpendicular vectors in the expression.

Q 3 An electric dipole of dipole moment p consists of point charges $+q$ and $-q$ separated by a distance $2a$ apart. Deduce the expression for the electric field E due to the dipole at a distance x from the center of the dipole on its (i) axial line (ii) equatorial line, in terms of the dipole moment p .

2. (i) Derive the expression for electric field at a point on the equatorial line of an electric dipole. Depict the orientation of the dipole (a) stable (b) unstable equilibrium in a uniform electric field.

Q 3 Obtain the expression for the resultant capacitance when three capacitors C_1 , C_2 and C_3 are connected (i) in series (ii) in parallel.

Q4. Define the capacitance of a capacitor. Obtain the expression for the capacitance of a parallel plate capacitor in vacuum in terms of plate area A and separation d between the plates.

Q 5 Using Gauss's theorem derive an expression for electric field intensity at any point due to infinite line charge of density λ . Plot the graph between E and r .

Q 6 Using Gauss's theorem derive an expression for electric field intensity due to charged spherical shell at any point (i) outside the shell (ii) on the shell (iii) inside the shell. Plot the graph which shows the variation of E and r in above cases.

Q 7 Write minimum 08 experiments in the fair practical notebook (04 from each section)

Q 8 Write 06 activities in the separate practical notebook (03 from each section)

Q 9 Numerical problems based on electrostatic force, intensity, potential, potential energy and capacitor.