Guess Paper – 2014
Class – XII
Subject – Physics

ELECTROSTATICS

1. Three charges $q_1 = 1\mu c, q_2 = -2\mu c and, q_3 = 3\mu c$ are placed on the vertices of an equilateral triangle of side 1.0m . Find the net electric force on the charge q_1.

2. Two identical balls each having a density ρ are suspended from a common point by two insulating strings of equal length . Both the balls have equal mass and charge. In equilibrium each string makes angle θ with vertical. Now , both the balls are immersed in a liquid . As a result the angle does not change. The density of the liquid is σ . Find the dielectric constant of the liquid.

3. A charge $q = 1\mu c$ is placed at point (1m,2m,4m). Find the electric field at point (0,-4,3m).

4. A uniform electric field E_o is directed along positive Y-axis . Find the change in electric potential energy of a positive test charge q_o when it is displaced in this field from y_i =a to y_f =2a along the y-axis.

5. A point charge q_1 is held stationary at the origin. A second point charge q_2 is placed at a point a, and the electric potential energy of the pair of charges is -6.4×10^{-8} J . When the second charge is moved to b, the electric force on the charge does 4.2×10^{-8} J of work . What is the electric potential energy of the pair of charges when the second charge is at the point b?

6. A charge q=10 μc is distributed uniformly over the circumference of a ring of radius 3m placed on x-y plane with its centre at origin . Find the electric potential at a point P(0,0,4m).

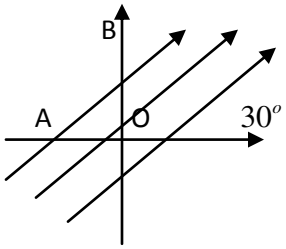
7. Find out the points on the line joining the two point charges +q and -3q, kept at a distance of 1m where electric potential is zero?

8. A rod of length L is lies along the x-axis with its left end at the origin. It has non-uniform charge density $\lambda = \alpha x$, where α is a positive constant.

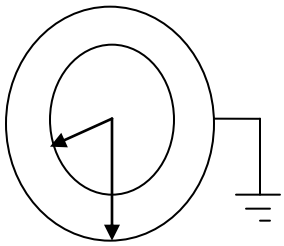
(a) What are the units of α ?
(b) Calculate the electric potential at point A where x=-d?

9. The electric potential in a region is represented as, V=2x+3y-z ,obtain expression for electric field .

10. A uniform electric field of 100V/m is directed at 30^o with the positive x-axis as in fig: Find the potential difference V_{BA}, if OA=2m, and OB=4m.



11. An electric dipole of dipole moment P is placed in a uniform electric field E in stable equilibrium position. Its moment of inertia about the centrodial axis is I. If it is displaced slightly from its mean position find the period of small oscillation.
12. A charge q is distributed uniformly on the surface of a sphere of radius R. It is covered by a concentric hollow conducting sphere of radius 2R. Find the charges on inner and outer surfaces of hollow sphere if it is earthen.



13. Fig : shows three concentric spherical shells A,B and C of radii R,2R and 3R . The shell B is earthen and A and C given charges q and 2q respectively . Find the charges appearing on the surfaces of A,B and C.

Paper Submitted By:

Name: Pintu paul

Email: pintupalphysics08@gmail.com

Phone No. 9774434119