

Electric Potential Assignment 2

Question 1

Calculate the amount of work done in assembling charge together to form a uniformly charged sphere.

Question 2

A charge Q is distributed over two concentric hollow spheres of radius r and $R(>r)$ such that the surface densities of both the spheres are equal. Find the potential at their common centre.

Question 3

The potential in the region of space near the point $P (-2,4,6)$ is $V=80x^2 + 60y^2$ V

- Find out the electric field vector in the region
- Find out the Electric field vector at point P
- What is the value of potential at point P

Question 4

Two circular wire loops of radii $.09$ m (loop I) and $.05$ m (Loop II) are placed such that their axes coincide and their center are $.12$ m apart. Charge of 10^{-6} C is distributed uniformly on each loop. Find the potential difference between the centers of loop

Question 5

There are three charges on a straight line One Positive Charge q , Two Negative Charge $-Q$. Find the value of q/Q so that the entire system is in equilibrium? Will this equilibrium be stable?

Question 6

A thread of length L placed along the x -axis with one end at the origin is electrified uniformly along its length with a net charge Q . Find the potential and electric field strength at a point P which is at a distance r from the origin along the axis of rod beyond the rod.

Question 7

A point electric dipole having dipole moment \mathbf{p} is placed in an external uniform electric field such that direction of dipole moment and electric field coincides. Find the radius of the sphere which forms one of the equipotential surfaces enclosing the dipole.

Question 8

Calculate the potential and field due to a dipole of dipole moment 3.5×10^{-11} C/m at a distance $.5$ m from it

- on its axis
- on its perpendicular bisector

Question 9

15 identical mercury drops are charged to a same potential of 5 Volts. Assuming the drops to be of spherical shape, find the potential of the large drop, made up of the combination of all the charged drops.