Class - 12th

Electric Charges and Fields

DPP – 06

Topics:

- **Continuous Charge Distribution**

1. A uniformly charged sphere carries a total charge of $2\pi \times 10^{-12}\ C$. Its radius is $5\ cm$ and is placed in vacuum. Determine its surface charge density.

2. What charge would be required to electrify a sphere of radius $15\ cm$ so as to get a surface charge density of $\frac{7}{11}\ \mu\ Cm^{-2}$?

3. A metal cube of length $0.1\ m$ is charged by $12\ \mu C$. Calculate its surface charge density.

4. Two spheres have their surface charge densities in the ratio $2:3$ and their radii in the ratio $3:2$. The ratio of the charges on them is _____.

5. A charged spherical conductor has a surface density of $0.7\ Cm^{-2}$. When its charge is increased by $0.44\ C$, the charge density changes by $0.14\ Cm^{-2}$. Find the radius of the sphere and initial charge on it.

6. Two equal spheres of water having equal and similar charges coalesce to form a large sphere. If no charge is lost, how will the surface densities of electrification change?

7. Sixty four drops of radius $0.02\ m$ and each carrying a charge of $5\ \mu C$ are combined to form a bigger drop. Find how the surface density of electrification will change if no charge is lost.

8. Obtain the formula for the electric field due to a long thin wire of uniform linear charge density λ without using Gauss's law. **[NCERT]**

9. A charge is distributed uniformly over a ring of radius $'a'$. Obtain an expression for the electric intensity E at a point on the axis of the ring. Hence show that for points at large distances from the ring, it behaves like a point charge. **[CBSE D 16, 20]**

Physics by – Nirbhay Sir