**1-ELECTROSTATICS**

1. *q = ne* 2. Mass transferred during charging = *me* x *n*

**2. Coulomb’s Law**

1.  2. 

**3. Principle of Superposition of Electric Forces**

1.  

**4. Relation between Electric Field Strength and Force**

**** or  ****

**5. Electric Fields of Point Charges**

1.  2. By the principle of superposition, electric field due to a number of point charges, 

**6. Continuous Charge Distributions**

1. Volume charge density,  2. Surface charge density,  3. Linear charge density,  4. Force exerted on a charge *q0* due to a continuous charge distribution,  5. Electric field due to a continuous charge distribution, 

**7. Dipole Moment, Dipole Field and Torque on a Dipole**

1. Dipole moment, ; where *2a* is the distance between the two charges. 2. Dipole field at an axial point at distance *r from the* centre of the dipole is  When *r >> a*,  3. Dipole field at an equatorial point art distance *r* from the centre of the dipole is 

When *r >> a,* 

4. Torque,  where is the angle between and 

**8. Electric Flux and Gauss’s Theorem**

1. Electric flux through a plane surface area S held in a uniform electric field is  where is the angle which the normal to the outward drawn normal to surface areamakes with the field. 2. According to Gauss’s theorem the total electric flux through a closed surface S enclosing charge q is  3. Flux density = 

**9. Applications of Gauss’s Theorem**

1. Electric field of a long straight wire of uniform linear charge density   where *r* is the perpendicular distance of the observation point from the wire. 2. Electric field of an infinite plane sheet of uniform surface charge density ,  3. Electric field of two positively charged parallel plates with charge densitiesand such that   (Outside the plates)  (Inside the plates) 4. Electric field of two equally and oppositely charged parallel plates. E = 0 (For outside points)  (For inside points) 5. Electric field of a thin spherical shell of charge density  and radius R,  For r > R (Outside points) E = 0 For r < R (inside points)  For r = R (At the surface) Here 

6. Electric field of a solid sphere of uniform charge density and radius R:  For r > R (Outside points)  For r > R (Inside points)  For r = R (At the surface) Here 