Shorts from past papers (relevant to our outline)
Electric Force, Charge, and Electric Fields

3. What is the electric force on a test charge placed outside a hollow charged spherical shell of charge Q?

Ans 3: The electric force on a test charge placed outside a hollow charged spherical shell of charge Q **is the same** and the force is calculated by Coulombs law such as: $F = kq_1q_2/ r^2$.

4. Define electric potential and give its units.

Ans 4: Electric potential is the amount of work done in bringing a unit positive charge from one point to another in an electric field.

Unit: It's SI unit is the **volt.**

5. Calculate the electric potential at a distance from a point charge, if q = 1.5 nC and r = 1 cm.

6. What is the relation between electric field and electric potential?

Ans 6: The relation between electric field and electric potential is that **the electric field is the negative gradient of the electric potential**,

$$\mathbf{E = -\nabla V}$$

7. Write the expression for electric potential due to a collection of point charges.

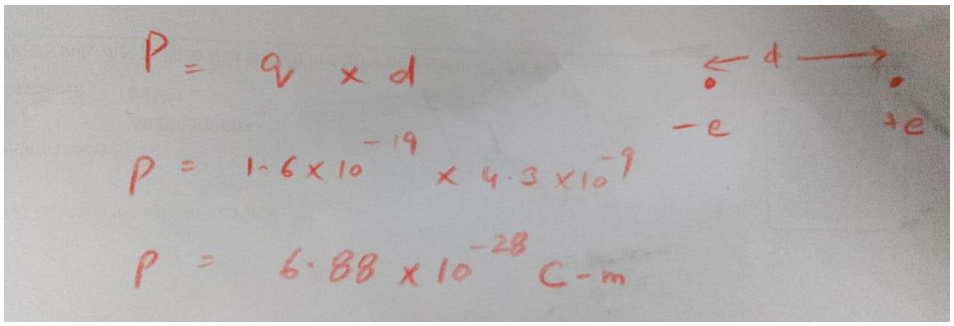
Ans 7: $\mathbf{V = KQ/r}$

8. What are equipotential surfaces? Explain their properties.

Ans 8: Every point in equipotential surface has the same electric potential.

9. Calculate the electric dipole moment of a proton and electron placed 2.3 mm apart.

Ans 9:



10. Sketch the electric field lines due to a single positive charge, single negative charge, and two opposite charges.