

TEST 12TH (26/06/2022) **PHYSICS CLASSES BY NAYAN JHA**

1. What do you mean by the term equipotential surface ? Draw the equipotential surface for (i) a point charge, (ii) an electric dipole , (iii) two positive charges of equal magnitude separated by some distance (iv) two uniformly large parallel thin plates having charge density $+\sigma$ and $-\sigma$ separated d distance apart. Can two equipotential surface intersect each other ? give reason. Why there is no work done in moving a charge fro one point to other on an equipotential surface?
2. Show that in a parallel plate capacitor if the medium between the plates of a capacitor filled with in insulating substance of dielectric constant K its capacitance increases . What will happen to the capacitance of a capacitor when conductor is filled between the plates, give reason.
3. Deduce the expression for the energy stored in the charged capacitor . (i)A fully charged capacitor is connected across an uncharged identical capacitor , show that the energy stored in the combination is less than the energy stored initially in the single capacitor. (ii)A parallel plate capacitor is charged by a battery to a potential, the battery is disconnected and a dielectric slab is inserted to fill completely the space between the plates . How will (a) its capacitance, (b) electric field between the plates and(c) energy stored in the capacitor be affected ? justify your answers.
4. Find the expression for electrostatic potential energy at any point due to a dipole. Using this expression find the potential at axial and equatorial point.
5. What do you mean by the term electric field intensity and dipole moment ? Write its S.I. units. Also find the expression for torque and potential energy for a dipole placed in uniform electric field. What effect occurs when dipole is placed in non-uniform electric field. Also explain the conditions of stable and unstable equilibrium.

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