CHAPTER-2
Electrostatic Potential and Capacitance
ASSIGNMENT-1

(1 MARK QUESTIONS)

Q1. What is the net charge on a charged capacitor?

Q2. What is an equipotential surface. Give an example.

Q3. What is the geometrical shape of equipotential surfaces due to a single isolated charge?

Q4. Why are electric field lines are perpendicular at a point on an equipotential surface of a conductor?

Q5. Define dielectric constant in terms of the capacitance of a capacitor.

Q6. What may be a possible reason of water having a much greater dielectric constant (=80) than say mica (=6)?

Q7.In what form is the energy stored in a charged capacitor?

MULTIPLE CHOICE QUESTIONS

Q8. If voltage applied on a capacitor is increased from V to 2V, choose the correct conclusion.

(a) Q remains the same, C is doubled

(b) Q is doubled, C doubled

(c) C remains same, Q doubled

(d) Both Q and C remain same

Q9. A parallel plate capacitor is charged. If the plates are pulled apart

(a) the capacitance increases

(b) the potential differences increase

(c) the total charge increases

(d) the charge & potential difference remain the same

Q10.Which of the following is an example of a molecule whose centre of mass of positive and negative charges coincide each other?

(a) CO_2 (b) CO (c) CH_3OH (d) NH_3

Q11.What is the angle between electric field and equipotential surface?

(a) 90^o always (b)0^o always (c)0^o to 90 (d)0^o to 180^o

Q12.If we carry a charge once around an equipotential path, then work done by the charge is:

(a) Infinity (b) Positive (c) Negative (d) Zero

2 MARKS QUESTIONS

Q13.Sketch equipotential surfaces for

(a) A negative point charge

(b) Two equal and positive charges separated by a small distance.

Q14.Deduce the expression for the potential energy of an electric dipole placed with its axis at anangle θ to the external field $\vec{E}$.Hence discuss the conditions of its stable and unstable equilibrium.

3 MARKS QUESTIONS

Q15. Obtain the expression for the resultant capacitance when three capacitors C_1 , C_2 and C_3 areconnected (i) in series (ii) in parallel.

Q16. Define the capacitance of a capacitor. Obtain the expression for the capacitance of a parallel plate capacitor in vacuum in terms of plate area A and separation d between the plates.

5 MARKS QUESTIONS

Q17. (a) Define the SI unit of capacitance.

(b) Obtain the expression for the capacitance of a parallel plate capacitor.Q18. (a) Define potential energy of a system of two charges.

(b)Two-point charges q_1 and q_2, separated by a distance r_{12} are kept in an external electricfield. Derive an expression for the potential energy of the system of two charges in the field.