

Assignment questions on e. potential & capacitance.

- 1) Define the following terms.
 - a) electrostatic potential
 - b) potential difference
 - c) 1 volt.
 - d) Equipotential surface
 - e) Capacitance of capacitor
 - f) 1 farad
 - g) Dielectrics.
- 2) Draw equipotential surfaces for i) two unlike charges.
ii) an isolated positive charge iii) an isolated -ve charge.
- 3) (a) What is capacitor? Mention its uses. (any two)
(b) What is electrostatic shielding? Mention its uses. (any two)
- 4) Mention the factors on which capacitance of capacitor depends?
- 5) Obtain an expression for e. potential due to an isolated point charge.
- 6) Derive an expression for the relationship between e.p. potential and e. field intensity.
- 7) Deduce, $\vec{E} = \frac{\sigma}{\epsilon_0} \hat{n}$ where $\sigma \rightarrow$ is surface density of charge
 $\epsilon_0 \rightarrow$ is permittivity of free space
 $\hat{n} \rightarrow$ is unit vector
- 8) Arrive an expression for e.p.e of system of 2 charges in an absence of external e. field.
- 9) Derive an expression for e-potential due to an e. dipole.
- 10) Obtain an expression for energy stored in a capacitor.
- 11) Arrive an expression for capacitance of parallel plate capacitor.
- 12) Show that $U = -\vec{P} \cdot \vec{E}$, where parameters have their usual meaning.
- 13) Derive expressions for equivalent capacitance of two capacitors when they are connected in (i) series & (ii) parallel.