

**Physics
CLASS XII**

ELECTROSTATICS & ELECTRICITY

- Q.1> Derive the value of electric field intensity due to a dipole at
(a) Axial point (b) Equatorial point
- Q.2> Derive the torque acting on a dipole placed in a uniform electric field.
- Q.3> Derive the expression for potential at a distance R from a point charge
- Q.4> Show that the line integral of electric field is independent of path
- Q.5> Derive the potential due to a dipole at (a) Axial point (b) Equatorial point
- Q.6> Deduce Coulomb's law using Gauss theorem
- Q.7> Prove Gauss theorem for the case of a point charge
- Q.8> Using Gauss theorem derive the electric field intensity at a distance R from
(a) A plane sheet of charge
(b) A line charge
(c) A charged shell
- Q.9> Derive the capacitance for a parallel plate capacitor
(a) With air in b/w the plates
(b) When the medium b/w the plates has a dielectric constant K
(c) With a dielectric slab (K) of thickness "t"
- Q.10> Derive the expression for energy stored in a capacitor and its energy density
- Q.11> A Capacitor C_1 is charged to V_1 & C_2 is charged to V_2 . They are then joined together. Find the common potential and the amount of energy lost. Why does this loss occur?
- Q.12> Derive the formula for equivalent capacitance in (a) Series (b) Parallel

Q.13> With the help of a labeled diagram, explain the construction and working of a VanDeGraff generator.

Q.14> Derive the expression for drift velocity and current

Q.15> Using the above results, derive ohm's law

Q.16> Derive the microscopic form of ohm's law

Q.17> Derive the formula for equivalent capacitance in (a) Series (b) Parallel

Q.18> Find the current flowing in the circuit when "n" cells each of emf "E" & internal resistance "r" are connected to an external resistor "R" in (a) Series (b) Parallel

Q.19> State the principle of a potentiometer and explain how it can be used to compare the emf of two *primary* cells.

Q.20> What is a wheatstone bridge? Derive the condition for it to be balanced.

Q.21> Explain how a Slide Wire / Meter bridge can be used to find an unknown resistance

Q.22> Using proper diagram, explain the construction and reactions of a

- (a) Voltaic cell and its defects
- (b) Leclanche cell
- (c) Daniel cell
- (d) Dry cell
- (e) Lead acid accumulator

Q.23> Explain the construction and working of a thermoelectric thermometer. Draw the calibration curve and mention 2 advantages and disadvantages.

Q.24> Briefly explain the following

- (a) Thermophile
- (b) Thermoelectric refrigerator
- (c) Thermoelectric generator

Q.25> Derive the expression for power loss in a resistance R when a potential difference of V is applied across its ends. Hence explain the usefulness of the fuse.