BCM SCHOOL, BASANT AVENUE, DUGRI ROAD, LUDHIANA

ASSIGNMENT

LONG ANSWER TYPE QUESTIONS

CLASS - XII

SUBJECT – PHYSICS

DATE: AUG 23, 2023

(a) Identify the physical quantity whose SI unit is Cm. IS it a scalar or vector? (b) An electric dipole is held in a uniform electric field. (i) Using suitable diagram show that it does not undergo any translatory motion. (ii) Derive an expression for torque acting on it. (c) Two charges of value 2µC and -50 µC are placed 80cm apart. Calculate the distance of the point from the smaller charge where the intensity is zero. **OR** (a) What are equipotential surfaces? (b) Show that the electric field lines and equipotential surfaces are perpendicular to each other. Draw equipotential surfaces corresponding to a field that uniformly increases in magnitude but remains constant along z-direction. How are these surfaces different from that of constant electric field along z-axis? (c) In a parallel plate capacitor with air between the plates, each plate has an area of $6 \times 10^{-3} m^2$ and the distance between the plates is 3mm. Calculate the capacitance of the capacitor. If this capacitor is connected to a 100V supply, what is the charge on each plate of the capacitor?	5
(a) Derive an expression for drift velocity of electrons. (b) How does the drift velocity of electrons in a metallic conductor vary with increase in temperature? (c) Two conducting wires X and Y of the same diameter but different materials are joined in series across a battery. If the number density of electrons in X is twice than in Y, find the ratio of drift velocity of electrons in two wires. **OR** (a) Using **Kirchhoff's laws**, derive the condition in which the Wheatstone's bridge is balanced. (b) Two cells of emfs 1.5 V **and 2 V having internal resistances 0.2Ω and 0.3Ω** respectively are connected in parallel. Calculate the emf and internal resistance of the equivalent cell	5