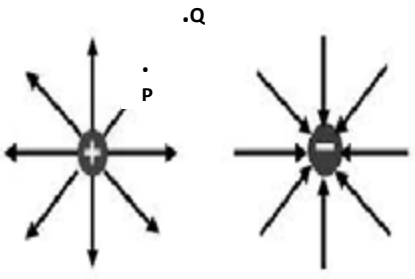
ELECTROSTATICS

ELECTROSTATIC POTENTIAL AND CAPACITANCE

Test Paper-I

MAX MARKS: 30 **TIME: 90Mts**

Sl.	QUESTION	ANSWER PAGE	MAR
1	What are conservative forces? Give some examples.	Page:51	2
2	Define electric potential energy difference between any two points. Also give the expression to find the same.	Page:52	2
3	Define electrostatic potential at a point. Give the expression to find the same.	Page:54	2
4	Plot a graph showing the variation of (i) Electrostatic potential (ii) electric intensity with distance r.	Page:55	2
5	(a)Calculate the potential at a point P due to a charge of 4 X 10^{-7}C located 9 cm away.(b) Hence obtain the work done in bringing a charge 2X 10^{-9}C from infinity to the point P. Does the answer depend on the path along which the charge is brought?	Page:55	3
6	Derive an expression to find the potential due to an electric dipole (i) at a point on the axis of the dipole and (ii) at a point on the equatorial line.	Page:56	3
7	Two charges 3 X 10^{-8}C and -2 X 10^{-8}C are located 15cm apart. At what point on the line joining the two charges is the electric potential zero? Take the potential at infinity to be zero.	Page:58	3
8	Fig shows the field lines of a positive and negative charges respectively.		3



a. Give the signs of the potential difference V_P-V_Q; V_B-V_A.

b. Give the sign of the potential energy difference of a small negative charge between the points Q and P; A and B.

c. Give the sign of the work done by the field in moving a small positive charge from Q to P.

d. Give the sign of the work done by the external agency in moving a small charge from B to A.

e. Does the kinetic energy of a small negative charge increase or decrease in going from B to A? **Page:59**

9 What is an equipotential surface? Draw the equipotential surfaces for the following 3

a. Uniform electric field

b. A Dipole

c. Two identical positive charges. **Page:60**

10 Give the relation between Electric field and electrostatic potential. What important conclusions that can be drawn from the relation? **Page:61** 3

11 Derive an expression to find the potential energy of a system of two charges in an external field. **Page:65** 3

12 How can you say that the electric field must be normal to the equipotential surface? **Page:60** 1