SIR C.V RAMAN COACHING CENTRE ,IDAPPADI,SALEM-637101

SUB: PHYSICS STD : XII Time : 1.00 hrs Date : 09.06.2023

UNIT : 1 **Electrostatics** Total mark : 35m

……

Dr.G.THIRUMOORTHI ,M.Sc,B.Ed,Ph.D ,*(physics)*

Assistant professor ,Govt Arts college salem -7

……

Section – A (5 x 1 = 5m)

I.Choose the best correct answer

1.Which one of these is a vector quantity ?

a) Electric charge b) Electric field c)Electric flux d) All

2. One joule per coulomb called ……

a) Gauss b) ampere c) farad d) volt

3. ……is a very large unit of of capacitance

a)farad b) micro farad c) nano farad d) pico farad

4. The value of relative permittivity of air is ……

a) 8.854×10^{-12} b) 9×10^{9} c) 8.854×10^{12} d) none of these

5. A condenser is charged to a potential of 200 V and has a charge of 0.1 C .The energy stored in it is ……..

a) 1 J b) 2 J c) 10 J d) 20 J

Section – B (5 X 3 = 15 m)

II.Answer any FIVE questions

6. Derive the expression for electrostatics potential due to a point charge

7. Obtain Gauss law from coulomb's law

8. What are polar and non polar molecule with suitable examples

9. Obtain the expression for electric field due to charged infinite plane sheet

10. Three capacitors each of capacitance 9 microfarad are connected series and parallel connection .

11. What are electric dipole with suitable examples any two and neat diagram

12. An electric dipole is placed at an alignment angle of 30^0 with an electric field of $2 X 10^5$ N/C .It experiences a torque equal tom 8 Nm. The charge on the dipole if the dipole length is 1 cm .

Section – C (3 x 5 = 15 m)

III.Answer any THREE questions

13. Derive an expression for electrostatic potential due to a electric dipole

14. A water molecule has an electric dipole moment of $6.3 x10^{-30}$ cm,a sample contains 10^{22} water molecule with all the dipole moments aligned parallel to the external electric field of magnitude $3 x 10^5$ N/C. how much work is required to rotated all the water molecule from 0^0 to 90^0

15. Derive the expression for resultant capacitors when capacitors are connected in (i) Series and(ii) parallel connections with neat diagram

16.(i) Define Gauss law .(ii)Derive the electric field due to two parallel charged infinite sheet

17.(i) What is meant by electrostatics . (ii)Calculate the electric flux through the rectangle of side 5cm and 10 cm kept in the region of a uniform electric field 100 N/C .the angle is 60^0 suppose angle becomes zero what is the electric flux .