One Two academy

Std 12 Physics Unit -1

Time: 60 minutes **Maximum marks: 35**

Choose the correct answer:- ***5 x 1 = 5***

1. Which one of the following statements is not true about electric field lines

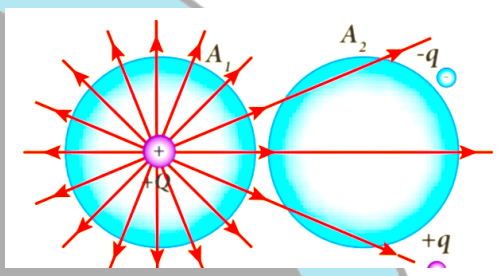
(a) Electric field lines start from a positive charge and end at a negative charge or infinity.

(b) The electric field vector at a point in space is tangential to the electric field line at that point.

(c) No two electric field lines intersect each other.

(d) The electric field lines are denser (closer) in a region where the electric field has a lesser magnitude.

2. Which of the following surfaces has zero electric flux?



(a) surface A_1 (b) surface A_2

(c)Both (a) and (b) (d) Neither (a) nor (b)

3. Dielectric strength of air is (in 10^6 Vm^{-1})

(a) 100 (b) 60 (c) 16 (d) 3

4. A parallel plate capacitor stores a charge Q at a voltage V. Suppose the area of the parallel plate capacitor and the distance between the plates are each doubled then which is the quantity that will change?

(a) Capacitance (b) Charge (c) Voltage (d) Energy density

5. Which charge configuration produces a uniform electric field?

(a) point charge (b) uniformly charged infinite line

(c) uniformly charged infinite plane (d) uniformly charged spherical shell

Answer any three of the following questions:- ***3 x 2 = 6***

6. What are the differences between Coulomb force and gravitational force?

7.Define 'electrostatic potential energy'.

8.Why it is advisable not to touch back side of the TV panel for a sometime after after it's switched off?

9. Consider a point charge +q placed at the origin and another point charge -2q placed at a distance of 9 m from the charge +q. Determine the point between the two charges at which electric potential is zero.

Answer any three of the following questions: ***3 x 3 = 9***

10. Obtain an expression for potential energy due to a collection of three point charges which are separated by finite distances.

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

12. Explain the principle behind the lighting conductor.

13. Calculate the electric flux through the rectangle of sides 5 cm and 10 cm kept in the region of a uniform electric field 100 NC^{-1}. The angle θ is 60^o. If θ becomes zero, what is the electric flux?

Answer the following questions: ***3 x 5 = 15***

14. Calculate the electric field due to a dipole on its axial line.

OR

Calculate electrostatic potential due to an electric dipole on its axial line.

15. Explain in detail the construction and working of a Van de Graaff generator.

OR

Discuss the various properties of conductors in electrostatic equilibrium.

16. a. Obtain the expression for capacitance for a parallel plate capacitor.

b. A parallel plate capacitor has square plates of side 5 cm and separated by a distance of 1 mm. Calculate the capacitance of this capacitor. ($\epsilon o = 8.85 \times 10–12\ N^{-1}m^{-2}\ C^2$)

OR

Derive the expression for resultant capacitance, when capacitors are connected in series and in parallel.

All the Best