**Prayag Public School**

**Class – 12**

**Holiday Assignment – 2.**

**Level – 2**

**Date: (22/ 6/2020 to 01/7/2020)**

**Note** : **Attempt all the questions compulsory .**

**Each assignment carrying marks.**

**Do it in a separate copy with neat and clean work.**

1. What orientation of an electric dipole in a uniform electric field corresponds to its stable equilibrium?

2. What is the area of the plates of a parallel plate capacitor of capacitance 2F and with separation between plates 0.5 cm?

3. What is the work done in carrying a point charge 10 nC between two points separated by a distance 5 cm on an equipotential surface?

4. A parallel plate capacitor is made by stacking ‘n’ equally spaced plates connected alternatively. If the capacitance between any two plates is ‘C’, determine the resultant capacitance of the combination

5. Calculate the coulomb force between two a particles separated by a distance of 3.2 x 10-15m

6. Draw graph showing variation of electric field with distance for a uniformly charged metallic sphere.

7. An electron and proton are free to move in an electric field. Which one will have greater acceleration? Why?

8. Sketch two equipotential surfaces for (a) a point charge. (b) between two plane sheets of charge.

9. Show that the work done in rotating an electric dipole of dipole moment p in a uniform electric field E by an angle θ from the equilibrium postition W = PE(1-cos θ)

10. The given graph shows the variation of charge ‘q’ verses potential difference for two capacitors C1 and C2 .The capacitors have same plate separation, but the plate area of C2 is double that of C1.Identify the line in the graph corresponding to C1 & C2 and why?

11. Derive an expression for the torque acting on an electric dipole placed in a uniform electric field.

12. Derive an expression for the capacitance of a parallel plate capacitor.

13. You are given three capacitors of value 2μF, 3μF, 6μF. How will you connect them to a resultant capacity of 4μF?

14. Two equally charged identical metal spheres A and B repel each other with a force of 2·0 x 10-5 N. Another identical uncharged sphere C is touched to A and then placed at the mid point between A and B. What is the net force on C?

15. A dielectric slab of thickness t introduced between the plates of a parallel plate capacitor separated by a distance d. (t < d). Derive an expression for the capacitance of the capacitor

16. Describe the principle construction and working of a Van de graff Generator with the help of a neat labeled diagram.

17. Use Gauss theorem to derive an expression for the electric field at a point due to

a. an infinite plane sheet of charge of uniform charge density σ

b. a thin infinitely long straight line  of charge of uniform charge density λ