JAZZ PUBLIC SCHOOL [MATRIC.HR.SEC]

UNIT 1 (ELECTROSTATICS)TEST -1   Time: 1.30 hrs

**Grade: 12**   **PHYSICS**   **Marks: 50**

Part-1

I.Choose the correct answer and write the option code and corresponding answer   **(1×10=10)**

1. Which are configuration produce a uniform electric field?
   a)point search   b. uniformly charged infinite line
   c. uniformly charged infinite plane
   d. the uniformly charged spherical cell

2. Three capacitors are connected in triangle as shown in the figure.The equivalent capacitance between the point A andC is
   a.1μF   b.2μF   c.3μF   d.1/4μF
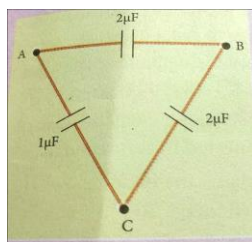
3. Rank the electrostatic potential energies for the given system of charges in increasing order
   a.1=4<2<3   b.2=4<3<1.   C.2=3<1<4.
   D.3<1<2<4
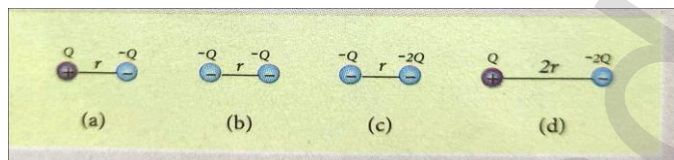
4. To identical conducting balls having positive charges q1 and q2 are separated by a centre to centre distance r. If they are made to touch each other and then separated to the same distance the force between them will be
   a)less than before   b)same as before

   c)more than before   d) zero

5. On electric table place place that on alignment angle of 30 degree with on electric field 2×10^5 NC^{-1}. If experience a torque equal to 8 Nm. The charge on the dipole if the dipole length is 1cm is
   a.4mC   b.8mC.   c.5mC.   d.7mC

6. The total electric flux for the following closed surface which is inside water

   a)89q/ϵ_0 b)q/40ϵ_0 c)q/80ϵ_0.   d)q/160ϵ_0
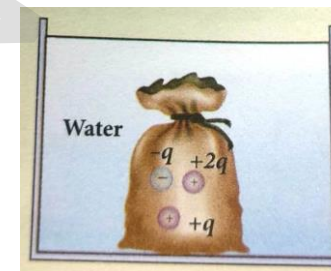
7.If voltage applied on a capacitor is increased from v to 2v ,choose the correct conclusion

   a) Q remains the same,c is doubled   b).Q is doubled,C is doubled

   c)C remains same,Q doubled   d) Q and c remain same

8.An electric field $\bar{E}=10x\hat{i}$ exits in a certain region of space, then the potential difference v = Vo-V$_A$, Where Vo is the potential at the origin and V_A is the potential at x=2m is

   a.10 v.   b.-20 v.   c. +20 v.   d.-10 v

9. …and coulomb's law from fundamental principles of electrostatics

   a. Newton's law of gravitation   b. Superposition principle

   c. Ohm's law.   d. Kepler's law

10. Which one of these is a vector quantity

   a. Electric charge   b. electric field   c. electric flux   d. electric potential

Part-II

II. Answer any five following questions question number 14 is compulsory

(5×2=10)

11. Define electric dipole .give its units

12. Give the electric field and electric potential

13. State Gauss law ?

14. Consider a point charge + q at the origin and another point charge

    – 2q place at a distance of 9 m from the charge + q. determine the point between the two charges at which electric potential is zero.

15. Write down coulombs law is vector form and mention what each term represents.

16. What is action of points?

17. What are the difference between coulomb force and gravitational force.

Part-III

Answer any five questions question number 23 compulsory,

(5×3=15)

18. Discuss the basic properties of electric charge

19. Drive an Expression for the torque experienced by a dipole due to a uniform electric field.

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

21. Obtain the expression for energy stored in the parallel plate capacitor.

22. Give application and disadvantage of capacitor.

23. A spark plug in a bike or a car is used to ignite the air-fuel mixture in the engine. It consists of two electrodes separated by a gap of around 0.6 mm gap as shown in the figure. To create the spark, an electric field of magnitude 3×10^6 V m^{-1} is required.

    (a) What potential difference must be applied to produce the spark?
    (b) If the gap is increased, does the potential difference increase, decrease or remains the same? (c) find the potential difference if the gap is 1 mm.

24. write a note on microwave oven.

Part-IV

Answer all the questions.   **(3×5=15)**

25.a. Calculate the electric field due to a dipole and its axial line.

    Or

    b. Obtain the expression for electric field due to on infinity long charged wire.

26.a. explain in detail the effect of dielectric placed in parallel plate capacitor

    Or

    b. Drive on expression for electrostatic potential due to on electric dipole

27.aDerive an expression for resultant capacitance when capacitor or connected in series and in parallel

    Or

    b. Explain in detail the construction and working of a van de graff generator