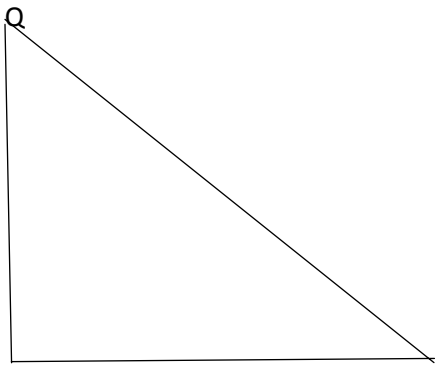
CET PHYSICS STUDY MATERIAL

1. A charge of 0.07 μ C is lying at a point A(3,5,-1) in a Cartesian coordinate point B(0,3,5) is
   1) 36V 2) 55V 3) 90V 4) zero
2. Two fixed charges -2Q and Q are located at the points with coordinates (-3a, 0) and 3a, 0) in the x – y plane. The locus of all points in the x – y plane where the electric potential due to the charges is zero is a
   1) Straight Line 2) Ellipse 3) Circle 4) Parabola
3. In Millikan's oil drop experiment an oil stationary by a potential difference 2400 V between the plates. To keep a drop of half the radius stationary the 600 V. What is the charge on the second drop
   1) Q/4 2) Q/2 3) Q 4) 3Q/2
4. Two point charges of magnitude 4 μ**C** and -9 $\mu\boldsymbol{C}$ are 0.5 m apart. The electrical intensity is zero at a distance x m from A and y m from B. x and y are respectively A

A------.

   1) 0.5m 1.0m 2) 1.0m; 1.5m 3) 2.0m; 1.5m 4) 1.5m; 2.0m

5. Two identical conducting spheres A and B are separated by a distance greater than their diameters. The spheres carry equal charges and the electrostatic force between them is F. A third identical uncharged sphere C is first brought in contact with A, then with B and finally removed. As a result, the electrostatic force between A and B becomes
   1) F/2 2) 3F/8 3) F/16 4) F/4
6. Three charges Q, +q and +q are placed at the vertices of a right angled isosceles triangle a shown. The net electrostatic energy of the configuration is zero if Q is equal to



   1) $\frac{q}{1+\sqrt{2}}$ 2) $-\frac{2q}{2+\sqrt{2}}$ 3) $-2q$ 4) $+q$

7. A circular ring of radius R is having uniformly distributed charge Q. Find the flux crossing through a sphere of radius R having its centre on the periphery of the ring.
   1) 0 2) $\frac{Q}{4\epsilon_0}$ 3) $\frac{Q}{\epsilon_0}$ 4) $\frac{Q}{3\epsilon_0}$
8. Two identical pendulums, A and B, are suspended from the same point. The bobs are given positive charges, with A having more charge than B. They diverge and reach equilibrium, with A and B making angles θ_1 and θ_2 with the vertical respectively.
   1) $\theta_1 > \theta_2$ 2) $\theta_1 < \theta_2$ 3) $\theta_1 = \theta_2$ 4) The tension in A is greater than that in B.

9. Two charged spheres A and B with +10 and +20 coulombs respectively are separated by a distance of 80 cm. The electric field at a point on a line joining the centres of the two spheres will be zero at a distance from the sphere A
   1) 20 cm 2) 33 cm 3) 55 cm 4) 60 cm
10. Like charges of equal magnitude q are kept at the equilateral triangle ABC as shown in the figure. The electric intensity E and potential V at the centroid are respectively.

    1) E = 0, V = 0 2) E=O, V≠ 0 3) E≠ $0, \mathrm{V} = 0$ 4) $\mathrm{E} \neq 0, \mathrm{V} \neq 0$
11. Two particles have charges Q and –Q. For a zero net force to be exerted on a third charged particle, it must be placed
    1) on the perpendicular bisector of line joining Q and –Q, to the side of Q opposite –Q, but not on that line itself
    2) on the line joining Q and –Q, to the side of Q opposite –Q
    3) on the line joining Q and –Q, to the side of –Q, opposite Q
    4) No such location is possible
12. A spherical liquid drop has a diameter of 2mm and is given a charge of 2 x 10^{15}coul. If two such drops coalesce to form a single drop, the potential at the surface of the drop so formed is $\left[4^{1/3} = 1.5874\right]$
    1) 0.007 V 2) 0.014V 3) 0.021 V 4) 0.028 V
13. A circle of radius r is drawn in a uniform electric field E as shown in figure. If $\mathrm{V}_A, \mathrm{V}_B, \mathrm{V}_C$and V_D are the potentials at A,B,C and D respectively, then

    1) $\mathrm{V}_A = \mathrm{V}_\mathrm{B}, \mathrm{V}_\mathrm{C} = \mathrm{V}_\mathrm{D}$ 2) $\mathrm{V}_\mathrm{A} = \mathrm{V}_\mathrm{B}, \mathrm{V}_\mathrm{C} > \mathrm{V}_\mathrm{D}$ 3) $\mathrm{V}_\mathrm{A} = \mathrm{V}_\mathrm{B}, \mathrm{V}_\mathrm{C} < \mathrm{V}_\mathrm{D}$ 4) $\mathrm{V}_\mathrm{A} > \mathrm{V}_\mathrm{B}, \mathrm{V}_\mathrm{C} = \mathrm{V}_\mathrm{D}$
14. The electric field in a region of space is given by E 5i + 2j N/C. The electric flux through an area 2 m^2 lying in the YZ plane in SI unit is
    1) 10 2) 20 3) 5 4) 15
15. Drawings 1 and II show two samples of electric field lines

    1) The electric fields in both I and II are produced by negative charge located some where on the left and positive charges located some where on the right
    2) In both I and II the electric field is the same every where
    3) In both cases the electric field becomes stronger on moving from left to right
    4) The electric field in I is the same every where; but in II the electric field becomes stronger on moving from left to right