

BAL BHARATI PUBLIC SCHOOL, PITAMPURA

REVISION WORKSHEET – Electrostatics(1)

KINDLY DO IN YOUR PHYSICS REGISTER

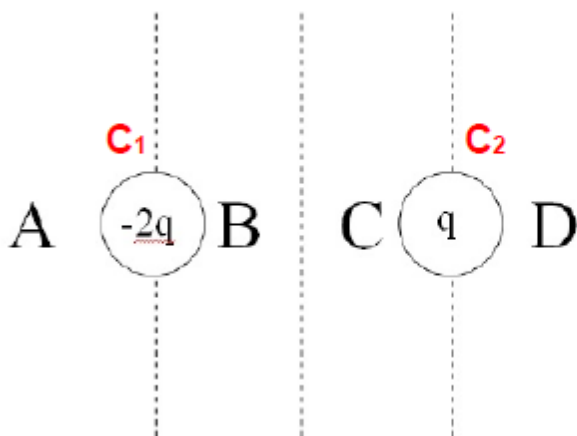
1. Two spherical conductors B and C having equal radii and carrying equal charges in them repel each other with a force F when kept apart at some distance. A third spherical conductor having same radius but uncharged is brought in contact with B then brought in contact with C and finally removed away from both. The new force of repulsion between B and C is

- (a) $F/4$ (b) $3F/4$ (c) $F/8$ (d) $3F/8$

2. An electric field strength created by charge Q is measured to be 40 N/C at a distance of 0.2 m from the center of the charge. What is the new field strength when the distance from the center of Q is changed to 0.4 m away with twice the charge of Q ?

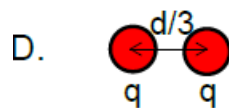
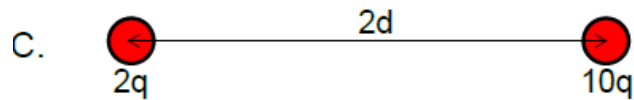
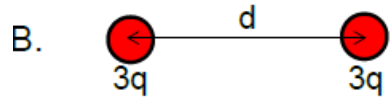
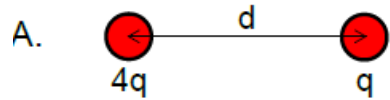
- A. 10 N/C B. 20 N/C C. 40 N/C D. 80 N/C

3 Two point charges (C_1 and C_2) are fixed as shown in the setup below. Now consider a third test charge with charge $-q$ that you can place anywhere you want in regions A, B, C, or D. In which region could you place the test charge so that the net force on the test charge is zero?



- A. Region A
B. Region B
C. Region C
D. Region D

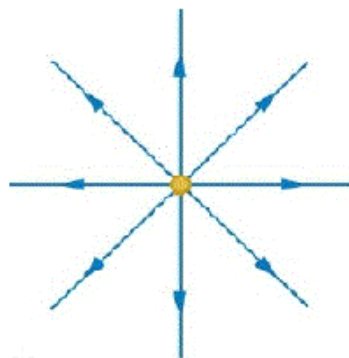
4 In each of the four scenarios listed below, the two charges remain fixed in place as shown. Rank the forces acting between the two charges from the greatest to the least.



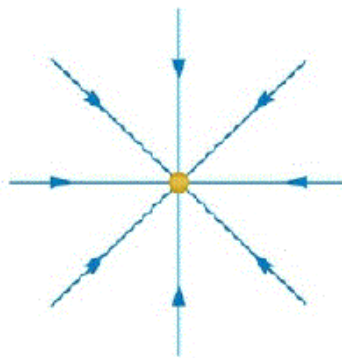
- A. $B = D > C > A$
 B. $C > B > A > D$
 C. $C > B = D > A$
 D. $D > A = B > C$
 E. $A > C > B = D$

5

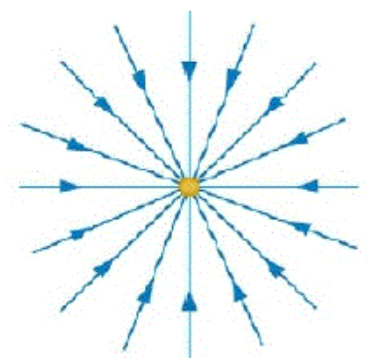
Given the following electric field diagrams:



(a)



(b)

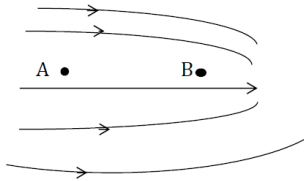


(c)

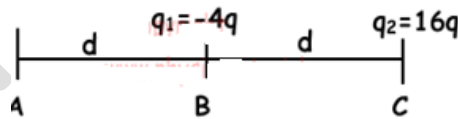
What are the respective charges of the yellow particles shown in diagrams (a), (b), and (c)?

- A. (a,b,c) = (-q, +q, +q) B. (a,b,c) = (+q, q, -q)
 C. (a,b,c) = (+q, -q, -2q) D. (a,b,c) = (-q, +q, +2q)
 E. (a,b,c) = (+2q, -2q, -q)

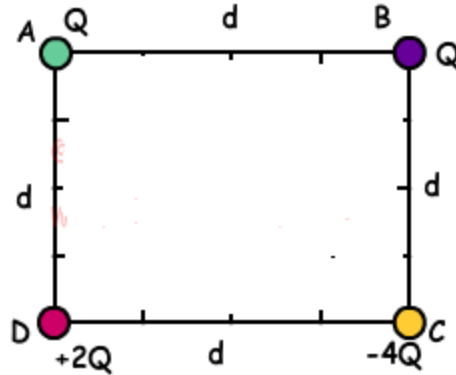
6 The electric field lines in a region are shown in the figure. A and B are two points in the region. At which point a charge '+q' experiences minimum force?



7. Two point charges $+8q$ and $-2q$ are located at $x=0$ and $x=L$ respectively. The location of a point on x axis at which the net electric field is zero is
- a. $2L$ b. $L/4$ c. $8L$ d. $4L$
8. An electric dipole is placed at an angle of 30° to a uniform electric field. The dipole will experience
- a. a torque and translational force
 b. a torque only
 c. a translational force only in the direction of the field
 d. a translational force only in the direction normal to that of field
9. Find the electric field at point A produced by charges q_1 and q_2 in terms of k , q and d .



10. If force applied by charge placed at point B on A is F , find forces applied by charges C and D on A in terms of F .



11 A point charge causes an electric flux of $-1.0 \times 10^3 \text{ Nm}^2/\text{C}$ to pass through a spherical Gaussian surface of 10.0 cm radius centred on the charge. (a) If the radius of the Gaussian surface were doubled, how much flux would pass through the surface? (b) What is the value of the point charge?

12 A total amount of charge Q is uniformly distributed along a thin ring of radius R . What is the electric field a point P on its axis a distance x from the center of the ring?

13 Electric field in the above figure is directed along + X direction and given by $E_x = 5Ax + 2B$, where E is in N/C and x is in metre, A and B are constants with dimensions Taking $A = 10 \text{ N/m/C}$ and $B = 5 \text{ N/C}$ calculate.

- (i) the electric flux through the cube.
- (ii) net charge enclosed within the cube.

