LAKSHYA (JEE)

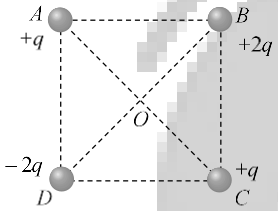
Electric Charges and Field

DPP-03

1. There are two charges +1 microcoulombs and +5 microcoulombs. The ratio of the forces acting on them will be

(a) 1 : 5 (b) 1 : 1
(c) 5 : 1 (d) 1 : 25

2. Four charges are arranged at the corners of a square $ABCD$, as shown in the adjoining figure. The force on the charge kept at the centre O is



(a) Zero
(b) Along the diagonal AC
(c) Along the diagonal BD
(d) Perpendicular to side AB

3. A total charge Q is broken in two parts Q_1 and Q_2 and they are placed at a distance R from each other. The maximum force of repulsion between them will occur, when

(a) $Q_2 = \frac{Q}{R}, Q_1 = Q - \frac{Q}{R}$
(b) $Q_2 = \frac{Q}{4}, Q_1 = Q - \frac{2Q}{3}$
(c) $Q_2 = \frac{Q}{4}, Q_1 = \frac{3Q}{4}$
(d) $Q_1 = \frac{Q}{2}, Q_2 = \frac{Q}{2}$

4. Three charges $4q, Q$ and q are in a straight line in the position of 0, $l/2$ and l respectively. The resultant force on q will be zero, if Q =

(a) $-q$ (b) $-2q$
(c) $-\frac{q}{2}$ (d) $4q$

5. Two small conducting spheres of equal radius have charges $+10\mu C$ and $-20\mu C$ respectively and placed at a distance R from each other experience force F_1. If they are brought in contact and separated to the same distance, they experience force F_2. The ratio of F_1 to F_2 is

(a) 1 : 8 (b) – 8 : 1
(c) 1 : 2 (d) – 2 : 1

6. An infinite number of charges, each of charge 1 μC, are placed on the x-axis with co-ordinates x = 1, 2, 4, 8, ...∞. If a charge of 1 C is kept at the origin, then what is the net force acting on 1 C charge

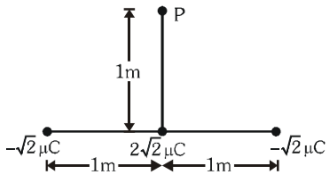
(a) 9000 N (b) 12000 N
(c) 24000 N (d) 36000 N

7. A charge q is placed at the centre of the line joining two equal charges Q. The system of the three charges will be in equilibrium, if q is equal to

(a) $-\frac{Q}{2}$ (b) $-\frac{Q}{4}$
(c) $+\frac{Q}{4}$ (d) $+\frac{Q}{2}$

8. Two charges of value 2 μC and – 50 μC are placed 80 cm apart. Calculate the distance of the point from the smaller charge where the intensity is zero

9. Three charges of respective values $-\sqrt{2}$ μC, $2\sqrt{2}$ μC and $-\sqrt{2}$ μC are arranged along a straight line as shown in the figure. Calculate the total electric field intensity due to all three charges at the point P.



ANSWERS

1. **(b)**
2. **(c)**
3. **(d)**
4. **(a)**
5. **(b)**
6. **(b)**
7. **(b)**
8. **(20 cm)**
9. $E_{net} = 16.46 \times 10^3$ N/C ,Direction of net electric field is perpendicular and away from the line AB.

***Note* - If you have any query/issue**

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