Coulomb's Law and Electric Field MCQ

SURI SIR
IIT BOMBAY

ACCORDING TO PHYSICS...
THE GLASS IS NEVER EMPTY

LIKE SHARE SUBSCRIBE

njoy_suri

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 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 $Q_1=\frac{Q}{2}, Q_2=\frac{Q}{2}$

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 occur, when

Two point charges Q_1 and Q_2 placed at separation d in vacuum and force acting then is F. Now a dielectric slab of thickness d/2 and dielectric constant K = 4 is placed between them. The new force between the charges will be

A $\frac{4F}{9}$

B $\frac{2F}{9}$

C $\frac{F}{9}$

D $\frac{5F}{9}$

Two point charges Q_1 and Q_2 placed at separation d in vacuum and force acting then is F. Now a dielectric slab of thickness d/2 and dielectric constant K = 4 is placed between them. The new force between the charges will be

Three charges +Q, q, +Q are placed respectively, at distance, 0, d/2 and d from the origin, on the x-axis. If the net force experienced by +Q, placed at x = 0, is zero, then value of q is

A -Q/4

B +Q/2

C +Q/4

D -Q/2

Three identical charges are placed at the vertices of an equilateral triangle. The force experienced by each charge (if $k = 1/4\pi\varepsilon_0$) is

A $2k\dfrac{q^2}{r^2}$

B $\dfrac{kq^2}{2r^2}$

C $\sqrt{3}k\dfrac{q^2}{r^2}$

D $\dfrac{kq^2}{\sqrt{2}r^2}$

Four charges equal -Q are placed at the four corners of a square and a charge q is at its centre. If the system is in equilibrium the value of q is

A $-\frac{Q}{2}\left(1+2\sqrt{2}\right)$

B $\frac{Q}{4}\left(1+2\sqrt{2}\right)$

C $-\frac{Q}{4}\left(1+2\sqrt{2}\right)$

D $\frac{Q}{2}\left(1+2\sqrt{2}\right)$

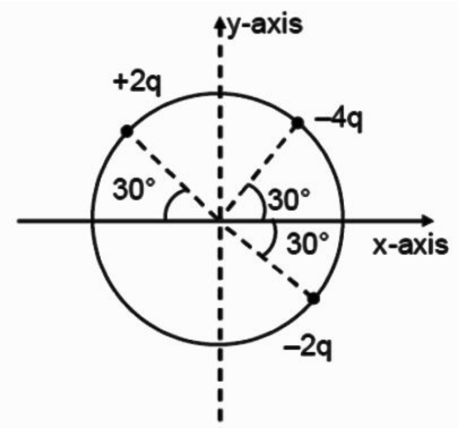
3 point charges are placed on circumference of a circle of radius 'd' as shown in figure. The electric field along x-axis at centre of circle is :

A $\dfrac{q}{4\pi\varepsilon_0 d^2}$

B $\dfrac{q\sqrt{3}}{4\pi\varepsilon_0 d^2}$

C $\dfrac{q\sqrt{3}}{\pi\varepsilon_0 d^2}$

D $\dfrac{q\sqrt{3}}{2\pi\varepsilon_0 d^2}$



Five point charges (+q each) are placed at the five vertices of a regular hexagon of side 2a. What is the magnitude of the net electric field at the centre of the hexagon?

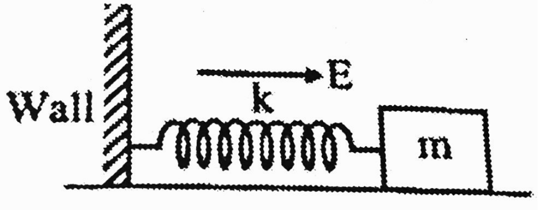
A $\frac{1}{4\pi\varepsilon_0}\frac{q^2}{a^2}$

B $\frac{q}{16\pi\varepsilon_0 a^2}$

C $\frac{\sqrt{2}q}{4\pi\varepsilon_0 a^2}$

D $\frac{5q}{16\pi\varepsilon_0 a^2}$

A point mass m and charge q is connected with massless spring of natural length L. Initially spring is in its natural length. If a horizontal uniform electric field E is switched on as shown in fig, then the maximum separation between the point mass and the wall is : (Assume all surface are frictionless)



A $L+\frac{2qE}{K}$

B $L+\frac{qE}{K}$

C L

D None of these

Three charges $+Q_1$, $+Q_2$ and q are placed on a straight line such that q is somewhere in between $+Q_1$ and $+Q_2$. If this system of charges is in equilibrium, what should be the magnitude and sign of charge q?

A $\dfrac{Q_1 Q_2}{\left(\sqrt{Q_1}+\sqrt{Q_2}\right)}$, positive

B $\dfrac{Q_1 + Q_2}{2}$, positive

C $\dfrac{Q_1 Q_2}{\left(\sqrt{Q_1}+\sqrt{Q_2}\right)^2}$, negative

D $\dfrac{Q_1 + Q_2}{2}$, negative