

DELHI PUBLIC SCHOOL, GAYA

WORKSHEET-1

Subject : Physics

Class : XII

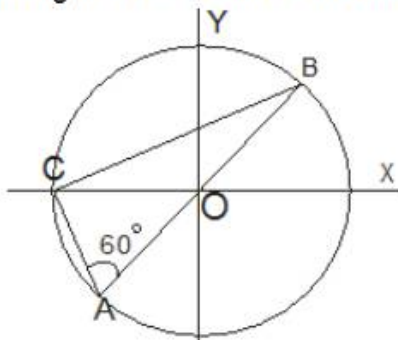
Question 1

A charge of magnitude q is divided into two parts such that force between resulting two charges is maximum when separated through some distance r . The division of charges would be

- (a) $3q/8$, $5q/8$
- (b) $2q/4$, $2q/4$
- (c) $q/2$, $q/2$
- (d) $3q/6$, $3q/6$

Question 2

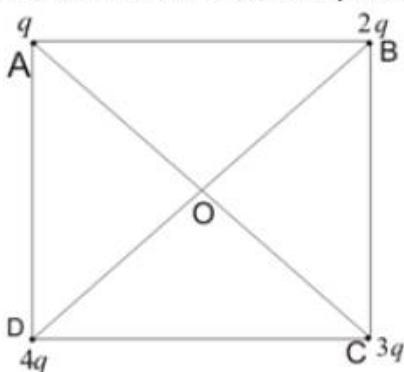
Consider a system of three charges $q/3$, $q/3$ and $-2q/3$ placed at points A, B and C respectively as shown in the figure. Take O to be the centre of the circle of radius R and angle $CAB = 60^\circ$



- (a) The electric field at point O is $q/8\pi\epsilon_0 R^2$
- (b) The magnitude of the force between the charges at C and B is $q^2/54\pi\epsilon_0 R^2$
- (c) The potential energy of the system is zero
- (d) The potential at point O is $q/12\pi\epsilon_0 R$

Question 3

Four charges q , $2q$, $3q$, $4q$ are placed at corners A, B, C and D of a square as shown below in the figure. The field at centre O of square has the direction along



- (a) \overrightarrow{AB}
- (b) \overrightarrow{CB}
- (c) \overrightarrow{AC}
- (d) \overrightarrow{DB}

Question 4

A point charge q is placed at geometrical centre of one of the face of a cube. The total flux through the cubical surface due to charge is

- (a) $\frac{q}{\epsilon_0}$
- (b) $\frac{q}{2\epsilon_0}$
- (c) $\frac{2q}{\epsilon_0}$
- (d) 0

Question 5

Two large metal sheets having surface charge density $+\sigma$ and $-\sigma$ are kept parallel to each other at a small separation distance d . The electric field at any point in the region between the plates is

- (a) σ/ϵ_0
- (b) $\sigma/2\epsilon_0$
- (c) $2\sigma/\epsilon_0$
- (d) $\sigma/4\epsilon_0$

Question 6

A rod lies along the x-axis with one end at the origin and other at $x \rightarrow \infty$ it carries a uniform charge λ C/m. Find the electric field at the point $x=-a$ on the x-axis

- (a) $\frac{-\lambda}{4\pi\epsilon_0 a} \mathbf{i}$
- (b) $\frac{-\lambda}{4\pi\epsilon_0 a^2} \mathbf{i}$
- (c) $\frac{\lambda}{4\pi\epsilon_0 a} \mathbf{i}$
- (d) $\frac{\lambda}{4\pi\epsilon_0 a^2} \mathbf{i}$

Question 7

Twelve charges of charge q are situated at the corners of the 12 sided polygon of side a . What is the net force on the charge Q at the centre

- (a) Zero
- (b) $3qQ/\pi\epsilon_0 a^2$
- (c) $qQ/\pi\epsilon_0 a^2$
- (d) None of the above

Question 8

Two positive point charge are placed at the distance a apart have sum Q . What values of the charges , coulomb force between them is maximum

- (a) $q_1=q_2=Q/2$
- (b) $q_1=3Q/4, q_2=Q/4$
- (c) $q_1=5Q/6, q_2=Q/6$
- (d) Non of the above

Question 9

A metallic shell having inner radius R_1 and outer radii R_2 has a point charge Q kept inside the cavity. Electric field in the region $R_1 < r < R_2$ where r is the distance from the centre is given by

- (a) depends on the value of r
- (b) Zero
- (c) Constant and nonzero everywhere
- (d) None of the above

Question 10

Consider two statements

(A) The force with which two charges interact is not changed by the presence of the other charges

(B) Electric force experienced by the charge particle due to number of fixed point charges is vector resultant of the forces experience due to individual charges

- (a) A and B both are correct
- (b) A is correct only
- (c) B is correct only
- (d) A and B both are wrong

-----X-----