

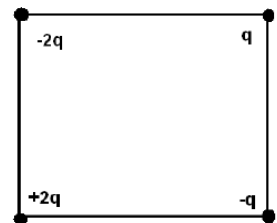
# Sainik School Chandrapur

## Class XII Physics

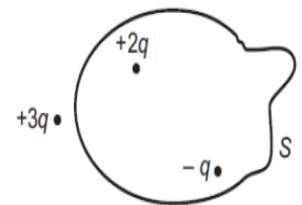
### Summer Vacation Holiday Home work 2023-24

1. the force acting between two-point charges  $q_1$  and  $q_2$  kept at some distance apart in air attractive or repulsive when i)  $q_1 q_2 > 0$  ii)  $q_1 q_2 < 0$ ?
2. If the distance between two equal point charges is doubled and their individual charges are also doubled, what would happen to the force between them?
3. Do the electrostatic field lines form close loops?
4. An infinite line charge produces a field of  $9 \times 10^4$  N/C at a distance of 2cm. Calculate the linear charge density.
5. Four-point charges  $q_A = 2 \mu\text{C}$ ,  $q_B = -5 \mu\text{C}$ ,  $q_C = 2 \mu\text{C}$ , and  $q_D = -5 \mu\text{C}$  are located at the corners of a square ABCD of side 10 cm. What is the force on a charge of  $1 \mu\text{C}$  placed at the centre of the square?
6. A hollow conducting sphere of radius 8cm is given a charge  $16\mu\text{C}$ . What is the electric field intensity i) at the centre of the sphere ii) on the outer surface of the sphere and iii) at a distance of 16cm from the centre of the sphere?

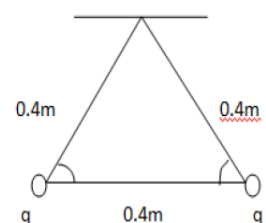
7. Four charges of  $-2q$ ,  $q$ ,  $-q$  and  $2q$  are at the corners of a square ABCD, of side 20cm, find the magnitude and the direction of the electric field at the centre of the square. Take  $q = 5 \mu\text{C}$



8. Figure shows three-point charges,  $+2q$ ,  $-q$  and  $+3q$ . Two charges  $+2q$  and  $-q$  are enclosed within a surface 'S'. What is the electric flux due to this configuration through the surface 'S'?



9. Two identical spheres, each of mass  $0.1 \times 10^{-3}\text{kg}$ , carry identical charges and are suspended by two threads of equal length. At equilibrium, they position themselves as shown in the figure. Calculate the charge on each of them.



10. Two electric charges of  $q$  and  $4q$  are placed at a distance of  $6a$  apart on a horizontal plane. Find the point on the line joining them where the resultant electric field is zero.

\*\*\*\*\*