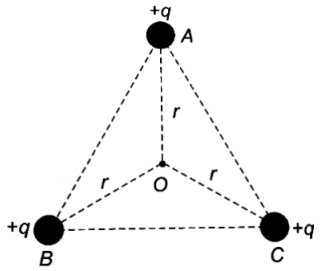
PHYSICS CLASS 12 BATCH

Electric Charges and Field

DPP-04

1. ABC is an equilateral triangle. Charge $+q$ are placed at each corner. The electric intensity at O will be:



(1) $\frac{1}{4\pi\varepsilon_0}\frac{q}{r^2}$ (2) $\frac{1}{4\pi\varepsilon_0}\frac{q}{r}$

(3) zero (4) $\frac{1}{4\pi\varepsilon_0}\frac{3q}{r^2}$

2. The magnitude of electric field intensity E is such that, an electron placed in it would experience an electrical force equal to its weight, is given by

(1) mge (2) $\frac{mg}{e}$

(3) $\frac{e}{mg}$ (4) $\frac{e^2}{m^2}g$

3. An electron and a proton are in a uniform electric field, the ratio of their accelerations will be

(1) zero
(2) unity
(3) The ratio of masses of proton and electron
(4) the ratio of the masses of electron and proton

4. The distance between the two charges 25μC and 36μC is 11 cm. At what point on the line joining the two, the electric field intensity will be zero

(1) At a distance of 5 cm from 25μC
(2) At a distance of 5 cm from 36μC
(3) At a distance of 10 cm from 25μC
(4) At a distance of 11 cm from 36μC

5. The intensity of electric field required to balance a proton of mass 1.7×10^{-27} kg and charge 1.6×10^{-19} C is nearly:

(1) 1×10^{-7} V/m (2) 1×10^{-5} V/m
(3) 2×10^{-7} V/m (4) 2×10^{5} V/m

6. Equal charges q are placed at the vertices A and B of an equilateral triangle ABC of side a. The magnitude of electric field at the point C is:

(1) $\frac{q}{4\pi\varepsilon_0 a^2}$ (2) $\frac{\sqrt{2}q}{4\pi\varepsilon_0 a^2}$

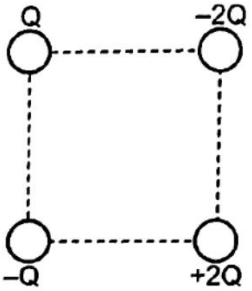
(3) $\frac{\sqrt{3}q}{4\pi\varepsilon_0 a^2}$ (4) $\frac{q}{2\pi\varepsilon_0 a^2}$

7. A cube of side b has a charge q at seven of its vertices. The electric field due to this charge distribution at the centre of this cube will be:

(1) $\frac{4k.q}{3b^2}$ (2) $\frac{kq}{2b^2}$

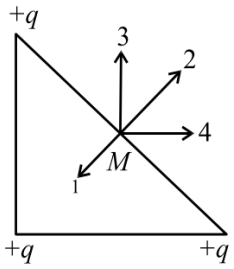
(3) $\frac{32kq}{b^2}$ (4) zero

8. Four charges are placed on corners of a square as shown in figure having side of 5 cm. If Q is one micro coulomb, then electric field intensity at centre will be:



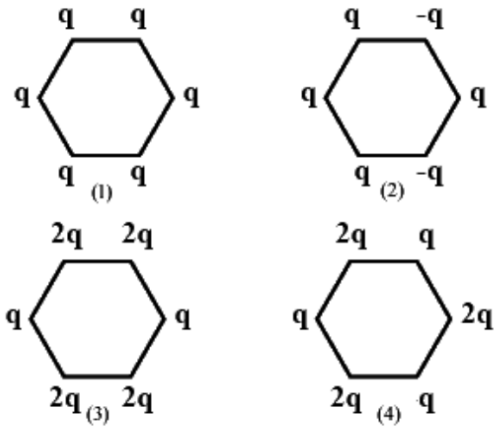
(1) 1.02×10^7 N/C upwards
(2) 2.04×10^7 N/C downwards
(3) 2.04×10^7 N/C upwards
(4) 1.02×10^7 N/C downwards

9. Three identical point charges, as shown, are placed at the vertices of an isosceles right angled triangle. Which of the numbered vectors coincides in direction with the electric field at the mid-point M the hypotenuse?



(1) 1 (2) 2
(3) 3 (4) 4

10. Figures below show regular hexagons, with charges at the vertices. In which of the following cases the electric field at the centre is not zero?



(1) 1 (2) 2
(3) 3 (4) 4

11. Infinite charges of magnitude q each are lying at x = 1, 2, 4, 8…. meter on X-axis. The value of intensity of electric field at point $x = 0$ due to these charges will be:

(1) $12 \times 10^9\ q$N/C (2) zero
(3) $6 \times 10^9\ q$N/C (4) $4 \times 10^9\ q$N/C

ANSWER KEY

1. (3)
2. (2)
3. (3)
4. (1)
5. (1)
6. (3)
7. (1)
8. (1)
9. (2)
10. (2)
11. (1)