CBSE NCERT Based Chapter wise Questions (2025-2026)
Class-XII
Subject: Physics
Chapter Name : *Electric Charges and Field* (Chapter : 1)
Total : 07 Marks (expected) [MCQ(2)-1 Mark, SA(1)-2 Marks, LA(1)-3 Marks]
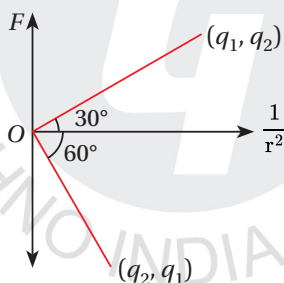
Level - 1

MCQ Type Questions :

1. When a negative charge (-Q) is brought near one face of a metal cube, the

 Ⓐ cube becomes positively charged

 Ⓑ cube becomes negatively charged

 Ⓒ face near the charge becomes positively charged and the opposite face becomes negatively charged

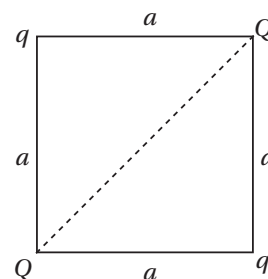 Ⓓ face near the charge becomes negatively charged and the opposite face becomes positively charged

                          [CBSE 23C]

2. The vehicles carrying inflammable fluids usually have metallic chains touching the ground

 Ⓐ to conduct excess charge due to air friction to the ground and prevent sparking

 Ⓑ to alert other vehicles.

 Ⓒ to protect tyres from catching dirt from the ground.

 Ⓓ as it is a custom.

3. Coulomb force F versus $\left(\dfrac{1}{r^2}\right)$ graphs for two pairs of point charges (q_1 and q_2) and (q_2 and q_1) are shown in the figure.

The ratio of charges $\left(\dfrac{q_1}{q_3}\right)$ **is**

 Ⓐ $\sqrt{3}$ Ⓑ $\dfrac{1}{\sqrt{3}}$ Ⓒ 3   Ⓓ $\dfrac{1}{3}$

4. Four charges as shown in figure are placed at the corners of a square of side length a. What is the ratio of (Q/q) if net force on Q is zero?

 Ⓐ $\dfrac{1}{2\sqrt{2}}$ Ⓑ $-2\sqrt{2}$

 Ⓒ $\dfrac{1}{2}$ Ⓓ $\dfrac{1}{\sqrt{2}}$

5. A particle of mass m and charge q is placed at rest in a uniform electric field E and then released, the kinetic energy attained by the particle after moving a distance y will be

 Ⓐ $q^2 Ey$ Ⓑ qEy Ⓒ $q E^2 y$ Ⓓ $q Ey^2$

6. A point charge of 10 μC is placed at the origin. At what location on the *X*-axis should a point charge of 40 μC be placed so that the net electric field is zero at *x* = 2 cm on the *X*-axis?

    (A) *x* = 6 cm   (B) *x* = 4 cm   (C) *x* = 8 cm   (D) *x* = –4 cm

7. A thin plastic rod is bent into a circular ring of radius *R*. It is uniformly charged with charge density λ. The magnitude of the electric field at its centre is

    (A) $\dfrac{\lambda}{2\varepsilon_0 R}$ (B) zero   (C) $\dfrac{\lambda}{4\pi\varepsilon_0 R}$ (D) $\dfrac{\lambda}{4\varepsilon_0 R}$

    [CBSE OD 24]

8. A point charge situated at a distance '*r*' from a short electric dipole on its axis, experiences a force $\vec{F}$. If the distance of the charge is '2*r*', the force on the charge will be

    (A) $\dfrac{\vec{F}}{16}$ (B) $\dfrac{\vec{F}}{8}$ (C) $\dfrac{\vec{F}}{4}$ (D) $\dfrac{\vec{F}}{2}$

    [CBSE OD 23]

Assertion-Reason based questions

   a) Both Assertion and Reason are correct and Reason is a correct explanation of Assertion
   b) Both Assertion and Reason are correct and Reason is not a correct explanation of Assertion
   c) Assertion is correct, Reason is incorrect
   d) Assertion is incorrect, Reason is correct

9. **Assertion:** The coulomb force is the dominating force in the universe.

    Reason: The coulomb force is weaker than the gravitational force.   [AMMS 03]

    (A) a   (B) b   (C) c   (D) d

10. **Assertion:** The tyres of aircrafts are made slightly conducting.

    Reason: If a conductor is connected to the ground, the extra charge induced on the conductor will flow to the ground.

    (A) a   (B) b   (C) c   (D) d

11. **Assertion:** In a non-uniform electric field, a dipole will have translatory as well as rotatory motion.

    Reason: In a non-uniform electric field, a dipole experiences a force as well as a torque.   [CBSE SP 21]
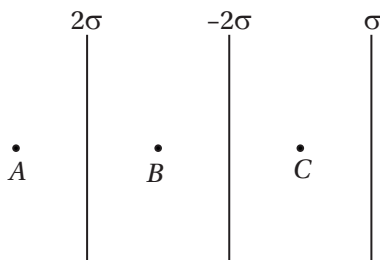
    (A) a   (B) b   (C) c   (D) d

Short Answer Type Questions (SAQ)

12. State Gauss theorem in electrostatics.

13. When does an electric dipole placed in a non uniform electric field experience a zero torque but non zero force? Explain.

14. What is the electric flux through a cube of side 1 cm? Which encloses an electric dipole?

15. Two fixed point charges +4*e* and +*e* units are separated by a distance *a*. Where should a third charge *q* be placed for it to be in equilibrium?

16. Define volume charge density at a point write its SI unit.

17. What is the angle between the directions of electric field at any (i) axial point and (ii) equitorial point due to an electric dipole.

Long Answer Type Questions (LAQ)

18. An electric dipole is placed in a uniform electric field. Derive expression for torque acting on it.

19. Gauss's law is based on the inverse-square dependence on distance contained in the coulomb's Law. Explain.

20. There are three infinite long thin sheets having surface charge density $+2\sigma$, -2σ and σ respectively. Give the magnitude and direction at the points A, B and C.

2σ -2σ σ

•
A •
B •
C

21. Use Gauss's law to derive the expression for the electric field ($\vec{E}$) due to a straight uniformly charged infinite line of charge infinite line.

22. Draw the lines of forces for the following cases.

(i) two point charges q_1 and q_2 ($q_1 > q_2$) placed at short separation.
(ii) for a electric dipole
(iii) uniform electric field

A N S W E R

1.	Ⓒ	6.	Ⓐ	11.	Ⓐ	16.	20.	zero
2.	Ⓐ	7.	Ⓑ	12.		17.	21.	$12\,\text{Vm}^{-1}$
3.	Ⓓ	8.	Ⓑ	13.		18.	22.	$1.125 \times 10^{7}\text{NC}^{-1}$
4.	Ⓑ	9.	Ⓓ	14.		19.	$\dfrac{3Ee}{2m}$	
5.	Ⓑ	10.	Ⓐ	15.				