

## Parishram (2025)

## Physics

DPP : 6

## Electric Charges and Fields

- Q1** A point  $Q$  lies on the perpendicular bisector of an electrical dipole of dipole moment  $p$ . If the distance of  $Q$  from the dipole is  $r$  (much larger than the size of the dipole), then electric field at  $Q$  is proportional to
- (A)  $p^{-1}$  and  $r^{-2}$   
(B)  $p$  and  $r^{-2}$   
(C)  $p^2$  and  $r^{-3}$   
(D)  $p$  and  $r^{-3}$
- Q2** The electric field due to an electric dipole at a distance  $r$  from its centre in axial position is  $E$ . If the dipole is rotated through an angle of  $90^\circ$  about its perpendicular axis, the electric field at the same point will be
- (A)  $E$   
(B)  $E/4$   
(C)  $E/2$   
(D)  $2E$
- Q3** A region surrounding a stationary electric dipoles has
- (A) Magnetic field only  
(B) Electric field only  
(C) Both electric and magnetic fields  
(D) No electric and magnetic fields
- Q4** A water molecule has an electric dipole moment  $6.4 \times 10^{-30} \text{ C} \cdot \text{m}$  when it is in vapour state. The distance in metre between the centre of positive and negative charge of the molecule is (Given that charge of positivity is  $1.6 \times 10^{-19} \text{ C}$ )
- (A)  $4 \times 10^{-10}$   
(B)  $4 \times 10^{-11}$   
(C)  $4 \times 10^{-12}$   
(D)  $4 \times 10^{-13}$
- Q5** The electric dipole moment of an electron and a proton  $4.3 \text{ nm}$  apart is
- (A)  $6.88 \times 10^{-28} \text{ Cm}$   
(B)  $2.56 \times 10^{-29} \text{ Cm}$   
(C)  $3.72 \times 10^{-14} \text{ Cm}$   
(D)  $11 \times 10^{-46} \text{ Cm}$
- Q6** The electric intensity due to a dipole of length  $10 \text{ cm}$  and having a charge of  $500 \mu\text{C}$ , at a point on the axis at a distance  $20 \text{ cm}$  from one of the charges in air, is
- (A)  $6.25 \times 10^7 \text{ N/C}$   
(B)  $9.28 \times 10^7 \text{ N/C}$   
(C)  $13.1 \times 10^{11} \text{ N/C}$   
(D)  $20.5 \times 10^7 \text{ N/C}$
- Q7** An electric dipole has a pair of equal and opposite point charges  $q$  and  $-q$  separated by a distance  $2x$ . The axis of the dipole is defined as
- (A) Direction from positive charge to negative charge  
(B) Direction from negative charge to positive charge  
(C) Perpendicular to the line joining the two charges drawn at the centre and pointing upward direction  
(D) Perpendicular to the line joining the two charges drawn at the centre and pointing



downward direction

**Q8** If the magnitude of intensity of electric field at a distance  $x$  on axial line and at a distance  $y$  on equatorial line on a given dipole are equal, then  $x : y$  is

- (A)  $1 : 1$
- (B)  $1 : \sqrt{2}$
- (C)  $1 : 2$
- (D)  $\sqrt[3]{2} : 1$



## Answer Key

Q1 (D)

Q2 (C)

Q3 (B)

Q4 (B)

Q5 (A)

Q6 (A)

Q7 (B)

Q8 (D)



# Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Video Solution:



Q2 Video Solution:



Q3 Video Solution:



Q4 Video Solution:



Q5 Video Solution:



Q6 Video Solution:



Q7 Video Solution:



Q8 Video Solution:



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