



- 1 *If an object possesses an electric charge, it is said to be electrified or ... A ... When it has no charge, it is said to be ... B ... Here, A and B refer to*
(a) charged, neutral (b) neutral, charged (c) discharged, charged (d) active, reactive
- 2 *A positively charged rod is brought near an uncharged conductor. If the rod is then suddenly withdrawn, the charge left on the conductor will be*
(a) positive (b) negative (c) zero (d) cannot say
- 3 *Two spheres A and B of exactly same mass are given equal positive and negative charges respectively. Their masses after charging*
(a) remains unaffected (b) mass of A > mass of B (c) mass of A < mass of B (d) Nothing can be said
- 4 *When some charge is transferred to ...A... it readily gets distributed over the entire surface of ... A... If some charge is put on ... B..., it stays at the same place. Here, A and B refer to*
(a) insulator, conductor (b) conductor, insulator (c) insulator, insulator (d) conductor, conductor
- 5 *The electric field due to an infinitely long straight uniformly charged wire at a distance r is directly proportional to*
(a) r (b) r² (c) 1/r (d) 1/r²
- 6 *Which of the following statements is incorrect?*
I. The charge q on a body is always given by $q = ne$, where n is any integer, positive or negative.
II. By convention, the charge on an electron is taken to be negative.
III. The fact that electric charge is always an integral multiple of e is termed as quantisation of charge.
IV. The quantisation of charge was experimentally demonstrated by Newton in 1912.
(a) Only I (b) Only II (c) Only IV (d) Only III
- 7 *Gauss's law is true only if force due to a charge varies as*
(a) r⁻¹ (b) r⁻² (c) r⁻³ (d) r⁻⁴
- 8 *Field due to multiple charges at a point is found by using*
I. superposition principle.
II. Coulomb's law.
III. law of conservation of charges.
(a) I and II (b) II and III (c) I and III (d) I, II and III
- 9 *Select the incorrect statements about electric field lines.*
I. Two electric field lines can never cross each other.
II. They start from positive charge and end at negative charge.
III. Electric field lines form closed loops.
(a) I and II (b) I and III (c) II and III (d) I, II and III
- 10 *Select the incorrect statements from the following.*
I. Polar molecules have permanent electric dipole moment.
II. CO₂ molecule is a polar molecule.
III. H₂O is a non-polar molecule.



- (a) II and III (b) I and II (c) I and III (d) I, II and III

11 Match the physical quantities in column I and the information related to them in Column II.

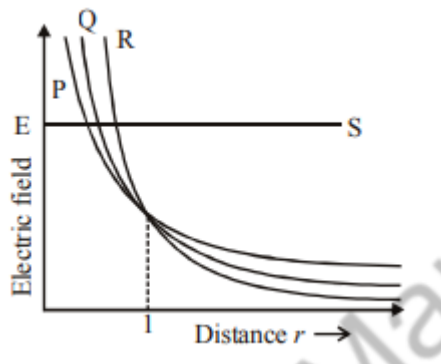
Column I

- (A) Electric dipole moment
(B) Electric field
(C) Electric flux
(D) Torque

Column II

- (1) Vector product
(2) Scalar product
(3) Points towards positive charge
(4) Points away from positive charge

12 The curves in the graph show the variation of electric field E with distance r for various kinds of charge distributions given in Column I. Match them with their correct curves in Column II.



Column I

- (A) Electric field of a point
(B) Electric field due to an
(C) Electric field due to a
(D) Electric field due to a

Column II

- (1) P sized dipole.
(2) Q infinitely long straight uniformly charged wire.
(3) R uniformly charged plane sheet.
(4) S point charge.

- (a) (A) - (2), (B) - (4), (C) - (3), (D) - (1)
(b) (A) - (4), (B) - (3), (C) - (2), (D) - (1)
(c) (A) - (1), (B) - (2), (C) - (3), (D) - (4)
(d) (A) - (3), (B) - (1), (C) - (4), (D) - (2)

13 **Directions** : Each of these questions contain two statements, Assertion and Reason. Each of these questions also has four alternative choices, only one of which is the correct answer. You have to select one of the codes (a), (b), (c) and (d) given below.

- (a) Assertion is correct, Reason is correct; Reason is a correct explanation for assertion.
(b) Assertion is correct, Reason is correct; Reason is not a correct explanation for assertion
(c) Assertion is correct, Reason is incorrect
(d) Assertion is incorrect, Reason is correct.

14 **Assertion** : When bodies are charged through friction, there is a transfer of electric charge from one body to another, but no creation or destruction of charge.

Reason: This follows from conservation of electric charges.



- 15 **Assertion** : Coulomb force and gravitational force follow the same inverse-square law.
Reason: Both laws are same in all aspects.
- 16 **Assertion** : The coulomb force is the dominating force in the universe.
Reason: The coulomb force is weaker than the gravitational force.
- 17 **Assertion** : If there exists coulomb attraction between two bodies, both of them may not be charged.
Reason: In coulomb attraction two bodies are oppositely charged.
- 18 **Assertion** : Electric lines of field cross each other.
Reason: Electric field at a point superimpose to give one resultant electric field.
- 19 **Assertion** : On bringing a positively charged rod near the uncharged conductor, the conductor gets attracted towards the rod.
Reason: The electric field lines of the charged rod are perpendicular to the surface of conductor.
- 20 **Assertion** : On going away from a point charge or a small electric dipole, electric field decreases at the same rate in both the cases.
Reason: Electric field is inversely proportional to square of distance from the charge or an electric dipole.
- 21 **The metal knob of a gold leaf electroscope is touched with a positively charged rod. When it is taken away the leaves stay separated. Now the metal knob is touched by negatively charged rod. The separation between the leaves**
(a) increases (b) decreases (c) remains same (d) first increases then decreases
- 22 **The force between two small charged spheres having charges of $1 \times 10^{-7} \text{ C}$ and $2 \times 10^{-7} \text{ C}$ placed 20 cm apart in air is**
(a) $4.5 \times 10^{-2} \text{ N}$ (b) $4.5 \times 10^{-3} \text{ N}$ (c) $5.4 \times 10^{-2} \text{ N}$ (d) $5.4 \times 10^{-3} \text{ N}$
- 23 **If a charge q is placed at the centre of the line joining two equal charges Q such that the system is in equilibrium then the value of q is**
(a) $Q/2$ (b) $-Q/2$ (c) $Q/4$ (d) $-Q/4$
- 24 **A charge Q is enclosed by a Gaussian spherical surface of radius R . If the radius is doubled, then the outward electric flux will**
(a) increase four times (b) be reduced to half (c) remain the same (d) be doubled
- 25 **An electric dipole is placed at an angle of 30° with an electric field of intensity $2 \times 10^5 \text{ NC}^{-1}$, It experiences a torque of 4 Nm. Calculate the charge on the dipole if the dipole length is 2 cm.**
(a) 8 mC (b) 4 mC (c) 8 PC (d) 2 mC
- 26 **Energy is stored in a capacitor in the form of**
(a) electrostatic energy (b) magnetic energy (c) light energy (d) heat energy
- 27 **A capacitor works in**
(a) A. C. circuits (b) D. C. circuits (c) both (a) and (b) (d) neither (a) nor (b)
- 28 **A parallel plate condenser is immersed in an oil of dielectric constant 2. The field between the plates is**
(a) increased, proportional to 2 (b) decreased, proportional to $\frac{1}{2}$ (c) increased, proportional to -2 (d) decreased, proportional to $-1/2$



29 *On decreasing the distance between the plates of a parallel plate capacitor, its capacitance*

- (a) remains unaffected (b) decreases (c) first increases then decreases. (d) increases

30 *Capacity of a parallel plate condenser can be increased by*

- (a) increasing the distance between the plates
 (b) increasing the thickness of the plates
 (c) decreasing the thickness of the plates
 (d) decreasing the distance between the plates

31 *Which of the following about potential difference between any two points is true?*

- I. It depends only on the initial and final position.
 II. It is the work done per unit positive charge in moving from one point to other.
 III. It is more for a positive charge of two units as compared to a positive charge of one unit.

- (a) I only (b) II only (c) I and II (d) I, II and III

32 *Consider the following statements and select the correct option*

- I. In an external electric field, the positive and negative charges of a non-polar molecule are displaced in opposite directions.
 II. In non-polar molecules displacement stops when the external force on the constituent charges of the molecule is balanced by the restoring force.
 III. The non-polar molecule develops an induced dipole moment.

- (a) I and II (b) II and III (c) I and III (d) I, II and III

33 *An electric dipole of moment \vec{P} is placed in a uniform electric field \vec{E} . Then which of the following is/are correct?*

- I. The torque on the dipole is $\vec{P} \times \vec{E}$.
 II. The potential energy of the system is $\vec{P} \cdot \vec{E}$.
 III. The resultant force on the dipole is zero.

- (a) I, II and III (b) I and III (c) II and III (d) I, II and III

34 *Match the entries of Column I and Column II*

Column I

Column II

(A) Inside a conductor

(1) Potential energy = 0 placed in an external electric field.

(B) At the centre of a dipole

(2) Electric field = 0

(C) Dipole in stable

(3) Electric potential = 0 equilibrium

(D) Electric dipole

(4) Torque = 0 perpendicular to uniform electric field.

- (a) (A) - (2); (B) - (4); (C) - (3); (D) - (1)
 (b) (A) - (2); (B) - (3); (C) - (4); (D) - (1)
 (c) (A) - (2); (B) - (3); (C) - (1); (D) - (4)
 (d) (A) - (1); (B) - (3); (C) - (4); (D) - (2)

35 *Assertion* : Work done in moving a charge between any two points in an electric field is independent of the path followed by the charge, between these points.

Reason: Electrostatic force is a non conservative force.



- 36 **Assertion** : Two equipotential surfaces cannot cut each other.
Reason: Two equipotential surfaces are parallel to each other.
- 37 **Assertion** : Polar molecules have permanent dipole moment.
Reason: In polar molecules, the centres of positive and negative charges coincide even when there is no external field.
- 38 **The expression $E = -dV/dr$ implies , that electric field is in that direction in which**
- (a) increase in potential is steepest.
 - (b) decrease in potential is steepest.
 - (c) change in potential is minimum.
 - (d) None of these
- 39 **A parallel plate capacitor with air between the plates is charged to a potential difference of 500V and then insulated. A plastic plate is inserted between the plates filling the whole gap. The potential difference between the plates now becomes 75V. The dielectric constant of plastic is**
- (a) 10/3 (b) 5 (c) 20/3 (d) 10
- 40 **A given charge is situated at a certain distance from an electric dipole in the end-on position experiences a force F. If the distance of the charge is doubled, the force acting on the charge will be**
- (a) 2F (b) F / 2 (c) F / 4 (d) F / 8