

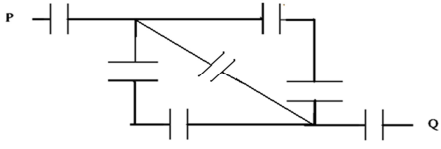
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| ONE MARK REV. TEST - 1 | Register Number | | | | | | |
| Time Allowed : 45 mins | XII – PHYSICS | Maximum Marks : 50 | | | | | |

Choose and write the correct answer.

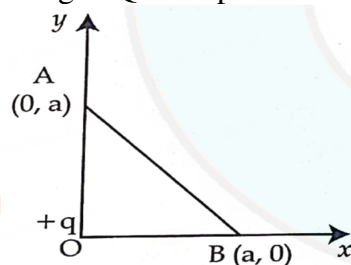
- Glass rod is rubbed with silk cloth acquires
 - positive charge
 - negative charge
 - first positive then negative
 - no charge
- Electric field lines always acts in the direction from
 - ∞ to $+q$
 - $-q$ to $+q$
 - $+q$ to $-q$
 - ∞ to $-q$
- The unit of permittivity is
 - $C N^{-1} m^{-2}$
 - $N m^2 C^{-2}$
 - $F m^{-1}$
 - $N C^{-2} m^{-2}$
- The charge of one sphere is doubled and another is halved then the force between the two charged sphere is
 - decreases twice
 - increases twice
 - increases four times
 - does not change
- The value of relative permittivity of medium is
 - $8.854 \times 10^{-12} C^2 N^{-1} m^{-2}$
 - $9 \times 10^9 N^{-1} m^{-2}$
 - 1
 - greater than 1
- The electrostatic force between two point charges kept at a distance d apart, in a medium $\epsilon_r = 9$, is 0.3 N. The force between them at the same separation in vacuum is
 - 2.7 N
 - 0.5 N
 - 1.8 N
 - 2 N
- If the medium between two charges is replaced by air, then the force between them
 - increases
 - decreases
 - becomes zero
 - remains constant
- Electric field intensity is $400 V m^{-1}$ at a distance of 2 m from a point charge. It will be $100 V m^{-1}$ at a distance?
 - 50 cm
 - 4 cm
 - 4 m
 - 1.5 m
- Four charges $+q, +q, -q$ and $-q$ respectively are placed at the corners A, B, C and D of a square of side a . The electric potential at the centre O of the square is
 - $\frac{1}{4\pi\epsilon_0} \frac{q}{a}$
 - $\frac{1}{4\pi\epsilon_0} \frac{2q}{a}$
 - $\frac{1}{4\pi\epsilon_0} \frac{4q}{a}$
 - zero
- The force of attraction between two charges $+30 \times 10^{-9} C$ and $-20 \times 10^{-9} C$ separated by distance of 0.2 m is $5 \times 10^{-5} N$. find the relative permittivity of the medium.
 - 2.7
 - 2.1
 - 2.2
 - 2.5
- What is the unit of electric flux?
 - V m
 - $N m^{-2} C^{-1}$
 - $N m^2 C$
 - $N m^{-2} C$
- If the moment of an electric dipole is $1.2 \times 10^{-9} Cm$ and the charge of the dipole is $0.4 \mu C$ then the distance between the charges is
 - 1.5 mm
 - 0.8 μm
 - 3 mm
 - $7.5 \times 10^9 m$
- If a point lies equatorial plane of the dipole at a distance x from the midpoint of the electric dipole, then the electric potential at this point is proportional to
 - $1/x^2$
 - $1/x^3$
 - $1/x^4$
 - 0
- Two point charges $+q$ and $-q$ are placed at points A and B respectively separated by a Small distance. The direction of \vec{P} at the midpoint of AB
 - is zero
 - acts along AB
 - acts along BA
 - acts perpendicular to AB

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15. The direction of electric field at a point on the equatorial plane due to an electric dipole is
 - a) along the equatorial line towards the dipole
 - b) along the equatorial line away from the dipole
 - c) parallel to the axis of the dipole and acts opposite to the direction of the dipole moment
 - d) parallel to the axis of the dipole and in the direction of dipole moment
16. A dipole is placed in a uniform electric field with its axis parallel to the field. It experiences
 - a) only a net force
 - b) only a torque
 - c) both a net force and torque
 - d) neither a net force nor a torque
17. Electric potential energy of an electric dipole in an electric field is minimum when dipole is placed.
 - a) perpendicular to the electric field
 - b) along the direction of electric field
 - c) opposite to the direction of electric field
 - d) at an angle 45° with the electric field
18. The electric field inside the two parallel oppositely charged plane sheet
 - a) 0
 - b) ∞
 - c) $\frac{\sigma}{\epsilon_0}$
 - d) $\frac{\sigma}{\epsilon}$
19. For a given distance, the electric potential due to a dipole is maximum if the point lies at
 - a) along the equatorial line
 - b) along the axial line on the side of $+q$
 - c) along the axial line on the side of $-q$
 - d) any where
20. The potential energy of the system in which one electron is brought closer to another electron will
 - a) increase
 - b) not change
 - c) decrease
 - d) become zero
21. In negative gradient of potential the distance between the two point is decreases, the potential and electric field will be
 - a) potential increases electric field decreases
 - b) potential decreases electric field increases
 - c) both potential and electric field are decreases
 - d) both potential and electric field are increases
22. The direction of equipotential surface and electric lines of force is
 - a) parallel to each other
 - b) perpendicular to each other
 - c) tangential to each other
 - d) none of these
23. A charge is moves radially outward on different equipotential surface from the point charge. The work done
 - a) zero
 - b) positive
 - c) negative
 - d) infinite
24. A infinite long straight charged wire no electric flux at
 - a) curved surface
 - b) top and bottom surface
 - c) inside the curved surface
 - d) all the above
25. The Electric field due to an infinite positive charged plane sheet is
 - a) $+\frac{\sigma}{2\epsilon_0}$
 - b) $-\frac{\sigma}{2\epsilon_0}$
 - c) $\frac{\sigma}{\epsilon_0}$
 - d) zero
26. Electric field at a point 2 m from a centre of spherical shell of radius 3 m carrying a charge of 6 C will be
 - a) 6×10^{-3} V/m
 - b) 0.6×10^{-3} V/m
 - c) ∞
 - d) 0
27. An equilateral triangle of 0.5m length on each side has $2\mu\text{C}$ charge on every corner. Then the electric potential energy of the system is.
 - a) 108×10^9 J
 - b) 324×10^6 J
 - c) 108×10^{-6} J
 - d) 216×10^{-3} J
28. Increasing the charge on the plates of a capacitor is
 - a) increasing the capacitance
 - b) decreasing the potential difference
 - c) both a and b
 - d) capacitance remains the same

29. When n capacitors are connected in series to a source of emf, then each one of them will have same
 a) potential difference b) charge c) both a and b d) none of these
30. A metal sheet is inserted in a parallel plate capacitor of capacitance C , The separation between the sheet is half. The new capacitance is
 a) $\frac{C}{2}$ b) $\frac{C}{4}$ c) $4C$ d) $2C$
31. In the electric circuit given below, capacitance of each capacitor is $1 \mu F$. The effective capacitance between the points P and Q is (in μF)
- 
- a) $\frac{2}{5}$ b) $\frac{6}{5}$ c) $\frac{5}{6}$ d) $\frac{5}{2}$
32. When ' n ' capacitors of equal capacitance (C) are connected in series and in parallel respectively, then the ratio of their effective capacitance is
 a) $1 : n^2$ b) $n^2 : 1$ c) $n : 1$ d) $1 : n$
33. If a capacitor of capacitance 55 pF is charged to 1.6 V , then the number of electrons on its negative plate is
 a) 55×10^7 b) 5.5×10^7 c) 550×10^7 d) 0.55×10^7
34. When each equal capacitance of capacitor are connected in parallel and series is $27 \mu F$ and $3 \mu F$ respectively. The number of capacitor is
 a) 9 b) 6 c) 3 d) 12
35. How many electrons make one nano coulomb of electric charge?
 a) 6.25×10^9 b) 62.5×10^9 c) 1.6×10^{-19} d) 0.625×10^9
36. The three different radius of charged spheres are connected by a wire the charge density of the spheres are
 a) different b) constant c) 0 d) ∞
37. The accumulation of charges in a charged conductor is maximum at
 a) a point where the curvature is maximum b) sharp points
 c) a point where the radius is minimum d) all the above
38. A capacitor of capacitance $6 \mu F$ is connected to a 100 V battery. The energy stored in the capacitor is
 a) 30 J b) 3 J c) 0.03 J d) 0.06 J
39. When a point charge of $6 \mu C$ is moved between two points in an electric field, work done is $1.8 \times 10^{-5} \text{ J}$. The potential difference between the two points is
 a) 1.08 V b) $1.08 \mu V$ c) 3 V d) 30 V
40. Three capacitances $1 \mu F$, $2 \mu F$ and $3 \mu F$ are connected in series. The effective capacitance of the capacitors is
 a) $6 \mu F$ b) $11/6 \mu F$ c) $6/11 \mu F$ d) $1/6 \mu F$
41. An electric dipole of moment \vec{P} is placed in a uniform electric field of intensity \vec{E} at an angle θ with respect to the field. The direction of torque is
 a) along the direction of \vec{P} b) opposite to the direction \vec{P}
 c) along the direction of \vec{E} d) perpendicular to the plane containing \vec{P} and \vec{E}

42. An electric dipole of dipole moment 'p' is kept parallel to an electric field of intensity 'E'. The work done in rotating the dipole through 90° is :
 a) Zero b) $-pE$ c) pE d) $2pE$
43. On moving a charge of 20 C by 2 cm, 2J of work is done, then the potential difference between the points is
 a) 0.5 V b) 0.1 V c) 8 V d) 2 V
44. A short electric dipole has a dipole moment of $16 \times 10^{-9} \text{ Cm}$. the electric potential due to the dipole at a point at a distance of 0.6 m from the centre of the dipole, situated on a line making an angle of 60° with the dipole axis is
 a) 200 V b) 400V c) zero d) 50V
45. An electric dipole is placed at an alignment angle of 30° with an electric field of $2 \times 10^5 \text{ N C}^{-1}$. It experiences a torque equal to 8 N m. The charge on the dipole if the dipole length is 1 cm is
 a) 4 mC b) 8 mC c) 5 mC d) 7 mC
46. in the given diagram a point charge +q is placed at the origin O. Work done in taking another point charge $-Q$ from point A to point B is:



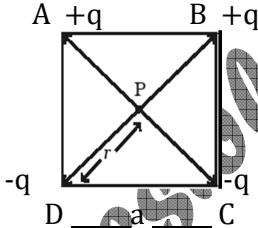
- a) $\frac{qQ}{4\pi\epsilon_0 a^2} \left(\frac{2}{\sqrt{2}} \right)$ b) zero c) $\left[\frac{-qQ}{4\pi\epsilon_0 a^2} \right] \sqrt{2a}$ d) $\left[\frac{qQ}{4\pi\epsilon_0 a^2} \right] \sqrt{2a}$
47. The electric field at a point 2 cm from an infinite line charge of linear charge density 10^{-7} Cm^{-1} is :
 a) $4.5 \times 10^4 \text{ NC}^{-1}$ b) $9 \times 10^4 \text{ NC}^{-1}$
 c) $9 \times 10^2 \text{ NC}^{-1}$ d) $18 \times 10^4 \text{ NC}^{-1}$
48. Force between two charges situated in a medium of permittivity ' ϵ ' is :
 a) $\frac{\epsilon}{4\pi} \frac{q_1 q_2}{r^2}$ b) $9 \times 10^9 \epsilon_r \frac{q_1 q_2}{r^2}$ c) $9 \times 10^9 \frac{q_1 q_2}{r^2}$ d) $\frac{9 \times 10^9}{\epsilon_r} \frac{q_1 q_2}{r^2}$
49. A and B are two hollow metal spheres of radii 50 cm and 1 m carrying charges $0.6 \mu\text{C}$ and $1 \mu\text{C}$ respectively. They are connected externally by a conducting wire. Now the charges flows from :
 a) A to B till the charges become equal b) A to B till the potential become equal
 c) B to A till the charges become equal d) B to A till the potential become equal
50. Van de Graaff generator works on the principle of
 a) electromagnetic induction and action of points b) electrostatic induction and action of points
 c) electrostatic induction only d) action of points only

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correct answer & explanation .

| S.No | Answer | Explanation |
|------|--------------------|--|
| 1. | a) positive charge | |
| 2. | c) +q to -q | |
| 3. | c) $F m^{-1}$ | From equation of Capacitance of a parallel plate capacitor $C = \frac{\epsilon_0 A}{d}$ $\epsilon_0 = \frac{Cd}{A} = \frac{Fm}{m^2} = F m^{-1}$ |
| 4. | d) does not change | Initially force on the two charged body $F = \frac{1}{4\pi\epsilon_0} \frac{q_1 q_2}{r^2}$ <p>Now $q_1' = 2q_1$ & $q_2' = \frac{q_2}{2}$</p> $F' = \frac{1}{4\pi\epsilon_0} \frac{q_1' q_2'}{r^2}$ $F' = \frac{1}{4\pi\epsilon_0} \frac{2q_1 \frac{q_2}{2}}{r^2}$ $= \frac{1}{4\pi\epsilon_0} \frac{q_1 q_2}{r^2}$ $F' = F \therefore \text{does not change}$ |
| 5. | d) greater than 1 | for medium $\epsilon_r > 1$ |
| 6. | a) 2.7 N | $\epsilon_r = 9$ In medium $F_m = \frac{1}{4\pi\epsilon} \frac{q_1 q_2}{r^2} = \frac{1}{4\pi\epsilon_0 \epsilon_r} \frac{q_1 q_2}{r^2} \dots (1)$ In vacuum $F = \frac{1}{4\pi\epsilon_0} \frac{q_1 q_2}{r^2} \dots (2)$ $\frac{(2)}{(1)} \Rightarrow \frac{F}{F_m} = \epsilon_r$ $F = F_m \epsilon_r = 0.3 \times 9 = 2.7 \text{ N}$ |
| 7. | a) increases | |

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| 8. | c) 4 m | <p><u>Sol:</u> $E = \frac{1}{4\pi\epsilon_0} \frac{q}{r^2} \Rightarrow E \propto \frac{1}{r^2}$</p> <p>$400 \propto \frac{1}{2^2} \dots\dots\dots 1 ;$</p> <p>$100 \propto \frac{1}{r^2} \dots\dots\dots 2$</p> <p>equation $\frac{(1)}{(2)} \Rightarrow 4 = \frac{r^2}{4} ;$</p> <p>$r^2 = 16 ; r = 4 \text{ m}$</p> |
| 9. | d) zero | <p><u>Sol:</u></p>  <p>$V = \frac{1}{4\pi\epsilon_0} \left[\frac{q}{r} + \frac{q}{r} - \frac{q}{r} - \frac{q}{r} \right]$</p> <p>$= \frac{1}{4\pi\epsilon_0} \left[\frac{2q - 2q}{r} \right] = \frac{1}{4\pi\epsilon_0} \left[\frac{0}{r} \right] = 0$</p> |
| 10. | a) 2.7 | <p>$F_m = \frac{1}{4\pi\epsilon} \frac{q_1 q_2}{r^2}$</p> <p>$= \frac{1}{4\pi\epsilon_0 \epsilon_r} \frac{q_1 q_2}{r^2}$</p> <p>$\Rightarrow \epsilon_r = \frac{1}{4\pi\epsilon_0 F_m} \frac{q_1 q_2}{r^2}$</p> <p>$\epsilon_r = \frac{9 \times 10^9 \times [30 \times 10^{-9}] [-20 \times 10^{-9}]}{5 \times 10^{-5} \times 0.2^2} = 2.7$</p> |
| 11. | a) V m | <p>$\phi = \vec{E} \cdot \vec{dA}$</p> <p>$= \frac{V}{m} \cdot m^2 = Vm$</p> |
| 12. | c) 3 mm | <p>$p = q2a \Rightarrow 2a = \frac{p}{q}$</p> <p>$2a = \frac{1.2 \times 10^{-9}}{0.4 \times 10^{-6}} = 3 \times 10^{-3} = 3 \text{ mm}$</p> |

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| 13. | d) 0 | <p><u>Sol:</u> $V = \frac{1}{4\pi\epsilon_0} \frac{P \cos \theta}{x^2}$</p> <p>If the point lies at equatorial plane, $\theta = 90^\circ$ $\cos 90^\circ = 0$ $V = 0$</p> |
| 14. | c) acts along BA | <p><u>Hints:</u></p> <p>+ve charge \rightarrow outward direction; -ve charge \rightarrow inward direction. so it acts along AB</p> |
| 15. | c) parallel to the axis of the dipole and acts opposite to the direction of the dipole moment | |
| 16. | d) neither a net force nor a torque | <p><u>Sol:</u> $F = qE + (-qE) = 0$ and $\tau = pE \sin \theta$ $= pE \sin 0^\circ = 0$ (since $\theta = 0^\circ$)</p> |
| 17. | b) along the direction of electric field | |
| 18. | b) along the direction of electric field | |
| 19. | c) $\frac{\sigma}{\epsilon_0}$ | <p><u>Sol:</u> E_1 and E_2 are equal magnitude and acts on same direction.</p> $E_1 + E_2 = \frac{\sigma}{2\epsilon_0} + \frac{\sigma}{2\epsilon_0}$ $= \frac{\sigma}{\epsilon_0}$ |
| 20. | b) along the axial line on the side of +q | $V = \frac{1}{4\pi\epsilon_0} \frac{P \cos \theta}{r^2} \quad [\cos \theta = 0^\circ]$ $V = \frac{1}{4\pi\epsilon_0} \frac{P}{r^2}$ |
| 21. | a) increase | <p><u>Hints:</u> Potential energy is inversely proportional to the distance between the two charges</p> |
| 22. | d) both potential and electric field are increases | |
| 23. | c) negative | |
| 24. | b) top and bottom surface | |
| 25. | a) $+\frac{\sigma}{2\epsilon_0}$ | |
| 26. | d) 0 | <p><u>Hints:</u> The electric field due to the uniformly charged spherical shell is zero at all points inside the shell.</p> |

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| 27. | d) $216 \times 10^{-3} \text{ J}$ | <p>Given data: $q_1 = q_2 = q_3 = q = 2 \times 10^{-6} \text{ C}$.</p> <p>Sol: The triangle is equilateral triangle</p> $AB = BC = CA = r = 0.5 \text{ m}$ <p>The potential energy of the system of charges,</p> $U = \frac{1}{4\pi\epsilon_0} \left[\frac{q_1 q_2}{r} + \frac{q_2 q_3}{r} + \frac{q_3 q_1}{r} \right]$ $U = \frac{1}{4\pi\epsilon_0} \left[\frac{q^2}{r} + \frac{q^2}{r} + \frac{q^2}{r} \right]$ $= \frac{1}{4\pi\epsilon_0} \frac{q^2}{r} [1 + 1 + 1]$ $U = \frac{9 \times 10^9 \times 4 \times 10^{-12}}{0.5} [3]$ $= 216 \times 10^{-3} \text{ J}$ |
| 28. | d) none of these | <p>Hints: $q \propto V$, if charge q is increases and v is also increases.</p> <p>$C = \frac{q}{V}$ so does not change</p> |
| 29. | b) charge | |
| 30. | d) $2C$ | $C = \frac{\epsilon_0 A}{d}$ <p>Now $d' = \frac{d}{2}$</p> $C' = \frac{\epsilon_0 A}{d'} = \frac{\epsilon_0 A}{d/2}$ $C' = \frac{2\epsilon_0 A}{d} = 2C$ |
| 31. | a) $\frac{2}{5}$ | |
| 32. | a) $1 : n^2$ | <p><u>Sol:</u> $C_p = nC$ and $C_s = \frac{C}{n}$</p> $\frac{C_s}{C_p} = \frac{C/n}{nC}$ $= \frac{C}{n^2 C} = \frac{1}{n^2}$ $C_s : C_p = 1 : n^2$ |

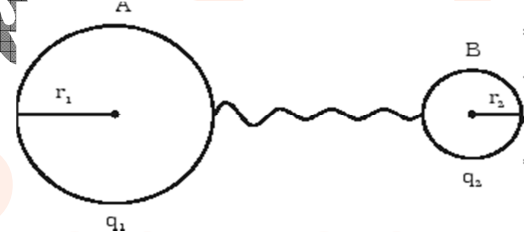
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| 33. | a) 55×10^7 | $Q = CV$ $= 55 \times 10^{-12} \times 1.6 = 88 \times 10^{-12} \text{ C}$ $Q = ne$ $n = \frac{Q}{e} = \frac{88 \times 10^{-12}}{1.6 \times 10^{-19}}$ $n = 55 \times 10^7$ |
| 34. | c) 3 | <u>Sol:</u> $C_p = nC$ and $C_s = \frac{C}{n}$ $\frac{C_p}{C_s} = \frac{nC}{C/n} = n^2$ $\Rightarrow n = \sqrt{\frac{C_p}{C_s}} = \sqrt{\frac{27}{3}}$ $n = 3$ |
| 35. | a) 6.25×10^9 | $Q = ne$ $n = \frac{Q}{e} = \frac{1 \times 10^{-9}}{1.6 \times 10^{-19}} = \frac{1 \times 10^{10}}{1.6}$ $= 0.625 \times 10^{10}$ $= 6.25 \times 10^9$ |
| 36. | a) different | $\sigma_1 r_1 = \sigma_2 r_2 = \sigma_3 r_3$ |
| 37. | a) a point where the curvature is maximum | |
| 38. | c) 0.03 J | <u>Sol:</u> $U = \frac{1}{2} CV^2$ $= \frac{1}{2} \times 6 \times 10^{-6} \times 100^2$ $= \frac{1}{2} \times 6 \times 10^{-2} = 3 \times 10^{-2}$ $U = 0.03 \text{ J}$ |
| 39. | c) 3 V | <u>Sol:</u> $W = Vq$; $V = \frac{W}{q}$ $= \frac{1.8 \times 10^{-5}}{6 \times 10^{-6}} = \frac{18}{6}$ $= 3 \text{ V}$ |

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| 40. | c) $6/11 \mu\text{F}$ | <p><u>Sol:</u> $\frac{1}{C_s} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3}$</p> $= \frac{1}{1} + \frac{1}{2} + \frac{1}{3}$ $= \frac{6+3+2}{6} = \frac{11}{6};$ $\Rightarrow C_s = \frac{6}{11} \mu\text{F}$ |
| 41. | d) perpendicular to the plane containing \vec{P} and \vec{E} | |
| 42. | c) pE | <p><u>Sol:</u> $dW = \tau \cdot d\theta$ (take integral on both sides)</p> $W = \int_0^{90} pE \sin \theta d\theta \quad [\text{since } \tau = pE \sin \theta]$ $= pE [-\cos \theta]_0^{90}$ $= -pE \cos 90^\circ + pE \cos 0^\circ = 0 + pE$ $W = pE$ |
| 43. | b) 0.1 V | $W = Vq; V = \frac{W}{q}$ $= \frac{2}{20} = 0.1 \text{ V}$ |
| 44. | a) 200 V | <p><u>Sol:</u> $V = \frac{1}{4\pi\epsilon_0} \frac{P \cos \theta}{r^2}$</p> $= \frac{9 \times 10^9 \times 16 \times 10^{-9} \times \cos 60^\circ}{0.6^2}$ $= \frac{9 \times 16}{0.36} \times \frac{1}{2} = 200 \text{ V}$ |
| 45. | b) 8 mC | <p><u>Sol:</u> $\tau = pE \sin \theta$</p> $p = \frac{\tau}{E \sin \theta} = \frac{8}{2 \times 10^5 \sin 30^\circ}$ $= \frac{8 \times 2}{2 \times 10^5} = 8 \times 10^{-5} \text{ Cm}$ $p = q2a$ $q = \frac{p}{2a} = \frac{8 \times 10^{-5}}{1 \times 10^{-2}}$ $= 8 \times 10^{-3} \text{ C}$ $q = 8 \text{ mC}$ |

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| 46. | b) zero | |
| 47. | b) $9 \times 10^4 \text{ NC}^{-1}$ | <p><u>Sol:</u> $\lambda = 10^{-7} \text{ Cm}^{-1}$</p> $E = \frac{\lambda}{2\pi\epsilon_0 r}$ $\frac{1}{4\pi\epsilon_0} = 9 \times 10^9$ $= \frac{18 \times 10^9 \times 10^{-7}}{2 \times 10^{-2}} \quad \left(\because \frac{1}{2\pi\epsilon_0} = 18 \times 10^9 \right)$ $= 9 \times 10^4 \text{ NC}^{-1}$ |
| 48. | d) $\frac{9 \times 10^9}{\epsilon_r} \frac{q_1 q_2}{r^2}$ | <p><u>Sol:</u></p> $F_m = \frac{1}{4\pi\epsilon} \frac{q_1 q_2}{r^2} \quad \therefore [\epsilon = \epsilon_0 \epsilon_r]$ $= \frac{1}{4\pi\epsilon_0 \epsilon_r} \frac{q_1 q_2}{r^2} \quad \left[\frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \right]$ $F_m = \frac{9 \times 10^9}{\epsilon_r} \frac{q_1 q_2}{r^2}$ |
| 49. | A to B till the potential become equal | <p><u>Sol:</u></p>  <div style="display: flex; justify-content: space-around;"> <div style="text-align: left;"> <p>Sphere A</p> $A_1 = 4\pi r_1^2$ $r_1 = 50 \times 10^{-2} \text{ m}$ $q_1 = 0.6 \times 10^{-6} \text{ C}$ $\sigma_1 = \frac{q_1}{A_1} = \frac{q_1}{4\pi r_1^2}$ $V_1 = \frac{q_1}{4\pi\epsilon_0 r_1}$ </div> <div style="text-align: left;"> <p>Sphere B</p> $A_2 = 4\pi r_2^2$ $r_2 = 1 \text{ m}$ $q_2 = 1 \times 10^{-6} \text{ C}$ $\sigma_2 = \frac{q_2}{A_2} = \frac{q_2}{4\pi r_2^2}$ $V_2 = \frac{q_2}{4\pi\epsilon_0 r_2}$ </div> </div> $\sigma_1 r_1 = \sigma_2 r_2$ $\frac{q_1}{4\pi r_1^2} r_1 = \frac{q_2}{4\pi r_2^2} r_2$ $\frac{q_1}{4\pi r_1} = \frac{q_2}{4\pi r_2} \quad \Rightarrow \quad \boxed{V_1 = V_2}$ $\frac{q_1}{r_1} = \frac{q_2}{r_2}$ $\frac{0.6 \times 10^{-6}}{50 \times 10^{-2}} = \frac{1 \times 10^{-6}}{1}$ $\frac{0.6 \times 10^{-6}}{50 \times 10^{-2}} = \frac{1 \times 10^{-6}}{1}$ |

| | | |
|-----|---|---|
| | | $0.6 = 0.5$ $0.6 > 0.5$ Charge can flows high potential to low potential $A \rightarrow B$ |
| 50. | b) electrostatic induction and action of points | |

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