PHYSICS

BOOKS - MODERN PUBLICATION

ELECTRIC FIELD

Example

1. Find the magnitude of electric field which will jut balance a deutron of mass 3.2×10^{-27}

Take $g = 10ms^{-2}$

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2. An electric dipole is formed by $+5\mu C$ and $-5\mu C$ charges at 4mm distance. Calculate the dipole moment and give tis direction.

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3. Two charges of $+25 \times 10^{-9}$ coulomb and -25×10^{-9} coulomb are placed 6 m apart.

Find the electric field at a point 4 m from the centre of the electric dipole on axial line

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4. Two charges of $+25 \times 10^{-9}$ coulomb and -25×10^{-9} coulomb are placed 6 m apart. Find the electric field at a point 4 m from the centre of the electric dipole on equitorial line.

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5. An electric dipole with dipole moment 4×10 ^−9 C m is aligned at 30^∘ with the direction of a uniform electric field of magnitude 5×10 ^4 N/C. Calculate the magnitude of the torque acting on the dipole.

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6. Calculate the electric field strength required to just support a water drop of mass 10^{-7} kg and having a charge $1.6 \times 10^{19} C$.

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7. A particle of mass $10^{-3}kg$ and charge $5\mu C$ is thrown at a speed $20ms^{-1}$ against a uniform electric field of strength $2 \times 10^5 NC^{-1}$, How much distance will it travel before coming to rest momentarily?

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8. An oil drop of 12 excess electrons is held stationary under a constant electric field of

$2.55 \times 10^4 NC^-1$ in Millikan's oil drop experiment. The density of the oil is $1.26 gcm^{-3}$. Estimate the radius of the drop. $\left(g = 9.81 ms^{-2}, e = 1.60 \times 10^{-19} C\right)$.

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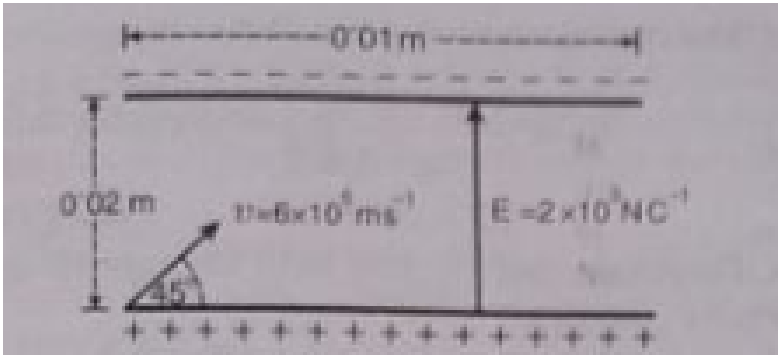
9. A uniform electric field of strength $2 \times 10^3 NC^{-1}$ is established between two parallel plates of length 0.1 m held horizontally at a distance 0.02 m apart. An electron is projected at a speed of $6 \times 10^6 ms^{-1}$ making

an angle 45° as shown in the figure



The field is directed vertically upwards. Will the electron strike the either plate? If it strikes the plate, where does it do so?

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10. A pendulum bob of mass 80 mg and carrying a charge of 2×10^{-8} coulomb is at

rest in a horizontal uniform electric field of 20,000 Vm^{-1}. Find the tension in thread of the pendulum and the angle it makes with the vertical.

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11. The point charge of 2×10^{-7}C and 1.0×10^{-7} are 1 cm apart. What is the magnitude of the field produced by either charge at the site of the other? Use standard magnitude of the field produced by either

charge at the site of the other? Use standard value of $\frac{1}{4\pi\varepsilon_0}$.

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12. Two point charges of $+5 \times 10^{-19} C$ and $+20 \times 10^{-19}$C are separated by a distance 2m. Find the point on the line joining them at which electric field intensity is zero.

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13. Two point charges $q_A = 3\mu C$ and $q_B = -3\mu C$ are located 20 cm apart in vacuum. What is the electric field at the midpoint O of the line AB joining the two charges?

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14. Two point charges $q_A = 3\mu C$ and $q_B = -3\mu C$ are located 20 cm apart in vacuum. If a negative test charge of

magnitude $1.5 \times 10^{-9} C$ is placed at this point, what is the force experienced by the test charge?

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15. Two point charges of $+16\mu C$ and $-9\mu C$ are placed 8 cm apart in air. Determine the position of the point at which the resultant electric field is zero.

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16. Four points charges, each having a charge q are placed on the four corners. A,B,C and D of a regular pentagon. ABCDF. The distance of eadch corner for the centre is a. Find the electric field at the centre of the pentagon.

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17. Point charges $4 \times 10^{-6} C$ and 2×10^{-6}C are placed at the vertices A and B of a right angled triangle ABC respectively. B is the right angle, AC $= 2 \times 10^{-2}$ m and BC = 10^{-2}m.

Find the magnitude and direction of the resultant electric intensity at C.

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18. A charge Q located at a point $\rightarrow r$ is in equilibrium under the combined electric field of three charges q_1, q_2 and q_3 if the charges q_1, q_2 are located at the points $\rightarrow r_1$ and $\rightarrow r_2$ respectively, find the direction of the force on Q, due to q_3, in term of $q_1, q_2, q_3 \rightarrow r, \rightarrow r_1,$ and $\rightarrow r_2$

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19. A dipole of lenth 0.1 m consits of two charges of $\pm 500\mu C$. What is its electric dipole moment? Calculate the electric field due to the dipole at a point on the axis distnat 0.2 m from one of the charges in air.

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20. Two charges of $\pm 0.2\mu\mu C$ and $-0.2\mu\mu C$ are placed 10^{-6} cm apart. Calculate the

electric field at an axial point at a distance of 10 cm from their mid point. Use the standard value of ε_0

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21. Calculate the field due to an electric dipole of length 10 cm and consisting of charges of $\neq 100\mu C$ at a point 20 cm from each charge.

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22. An electric dipole, when held at 30° with respect to a uniform electrc field of $10^4 NC^{-1}$ experienes a troque of $9 \times 10^{25} Nm$. Calculate dipole moment of the dipole.

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23. Four charges of $+4, -3, +2$ and $+3$ coulomb are placed at the corners of a square of each side 1m. Find the electric field at the

centre of the square.

$Given = \varepsilon_0 = 8.85 \times 10^{-12} C^2 N^{-1} m^{-2}$

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24. An infinite number of charges, each equal to q are placed along X-axis at x=1,x=2,x=4, x=8,..... and so on. Find electric field at the point $x \neq 0$ due to this set of charges.

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25. An infinite number of charges, each equal to q are placed along X-axis at x=1,x=2,x=4, x=8,..... and so on. Find electric field at the point $x \neq 0$ due to this set of charges.

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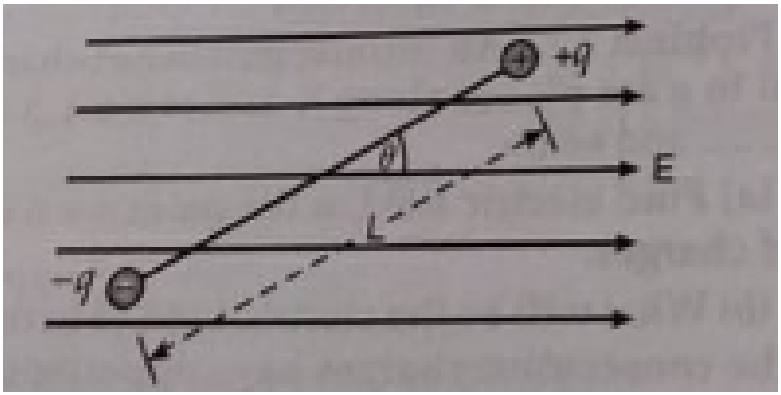
26. A point particle of mass M is attached to one end of a massless rigid non-conducting rod of length L. Another point particle of the same mass is attached to the other end of the

rod. The two particles carry charges +q and -q respectively. This arrangement is held in a region of a uniform electric field E such that the rod makes a small angle theta (say of about 5 degree) with the field direction, fig. Find an expression for the minimum time needed for the rod to become parrallel to the field after it is set free.



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27. Is electric field intensity a scalar or a vector quantity. Give its SI units.

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28. The test charge used to measure electric field at a point should be vansihgly small. Why?

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29. Define electric field intensity at a point.

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30. Does an electric charge experience a force due to the field, it produces itself?

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31. A proton is placed in a uniform electric field along the positive X-axis. In which direction

will it tend to move?

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32. What is the SI unit of electric field intensity?

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33. Name the physical quantity, whose SI unit is newton coulomb $\hat{} -1$

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34. A point charge q is placed at the origin. How does the electric field due to the charge vary with distance r from the origin?

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35. What is electric dipole moment?

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36. Define the term electric dipole moment. Is it a scalar or a vector quantity?

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37. What is electric dipole moment?

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38. What is the direction of electric dipole moment vector of an electric dipole?

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39. Give the S.I unit of electric dipole moment.

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40. Is it correct to write the unit of electric dipole moment as mC?

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41. What is the direction of electric field at a point on axial line of an electric dipole?

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42. What is the direction of electric field at a point on the equitorial line of an electric dipole?

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43. Write a relation between electric field at a point and its distance from a short dipole.

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44. What are electric lines of force ?

Watch Video Solution

45. Draw lines of force to represent a uniform electric field?

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46. Two electric lines never cross each other. Why?

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47. Why do the electrostatic field lines not form closed loops?

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48. Does an electric dipole always experiene a torque, when placed in a uniform electric field?

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49. When is the torque acting on an electric dipole maximum when placed in uniform electric field ?

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50. When is the torque acting on an electric dipole maximum when placed in uniform electric field ?

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51. An electric dipole of dipole moment $\rightarrow p$ is present in a uniform electric field $\rightarrow E$. Write the value of the angle between $\rightarrow p$ and $\rightarrow E$ for which the torque experienced by the dipole is minimum.

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52. What orientation of an electric dipole in a uniform electric field corresponds to its stable equilibrium?

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53. What orientation of an electric dipole in a uniform electric field corresponds to its stable equilibrium?

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54. In which orientation,a dipole placed in a uniform electric field is in unstable equilibrium?

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55. The electric field E due to any point charge is defined as $E = \lim_{q \to 0} \frac{F}{q}$, while q is the test charge and F is the force acting on it. What is

the physical signification of $\lim_{q \to 0}$ in this expression?

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56. Define electric field intensity due to point charger. Give is SI units.

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57. Determine the magnitude of an electric field that will balance the weight of an

electron.

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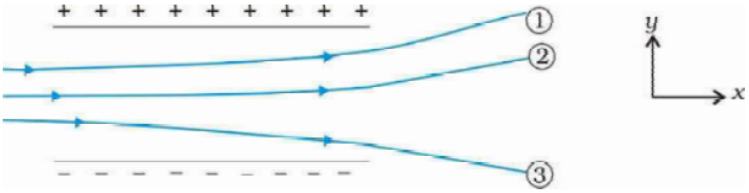
58. Figure shows tracks of three charged particles in a uniform electrostatic field. Give the signs of the three charges. Which particle has the highest charge to mass ratio?:



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59. A distance of 2 m separates two point charges of $+5 \times 10^{-19} C$. Find the point on the line joining them at which electric field intensity is zero.

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60. Two point electric charges of unknown magnitude and sign are placed a distance apart. The electric field intensity is zero at a point not between the charges but on the line

joining them. Write two essential conditions for this to happen.

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61. Define a point electric dipole?

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62. What is an ideal dipole?

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63. What is the ratio of the strength of electric field at a point on axial line and at a point at same distance on equitorial line of an electric dipole of very small length?

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64. What is the angle between the directions of electric dipole moment and electric field at any axial point

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65. What is the angle between the directions of electric dipole moment and electric field at any equitorial point due to an electric dipole?

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66. The distance of the field point on the equitorial plane of a small electric dipole is halved. By what fector will the electric field due to the dipole change?

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67. Define intensity of electric field at a point at what points is the electric dipole field intensity parallel to the line joining the charges?

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68. At what points is the electric dipole field intensity parallel to the line joining the charges?

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69. A system has two charges $q_A = 2.5 \times 10^{-7}$C and $q_B = -2.5 \times 10^{-7} C$ located at points A: (0, 0, -15 cm) and B: (0,0, +15 cm), respectively. What are the total charge and electric dipole moment of the system?

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70. An electric dipole of dipole moment $\bar{p}$ is placed in a uniform electric field $\overrightarrow{E}$. Write the expression for the torque $\rightarrow r$ experienced by the dipole. Identify the two pairs of perpendicular vectors in the expression. Show diagramatically the orientation of the dipole in the field for which the torque is maximum

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71. An electric dipole of dipole moment $\bar{p}$ is placed in a uniform electric field $\overrightarrow{E}$. Write the expression for the torque $\rightarrow r$ experienced by the dipole. Identify the two pairs of perpendicular vectors in the expression. Show diagramatically the orientation of the dipole in the field for which the torque is half the maximum value

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72. An electric dipole of dipole moment $\bar{p}$ is placed in a uniform electric field $\overrightarrow{E}$. Write the expression for the torque $\rightarrow r$ experienced by the dipole. Identify the two pairs of perpendicular vectors in the expression. Show diagramatically the orientation of the dipole in the field for which the torque is half zero.

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73. What is meant by the statement that the electric field of a point charge has spherical symmetry, whereas that f an electric dipole is cylindrically symmetrical?

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74. Define electric lie of force and give its three important properties.

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75. What are electric lines of force ?

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76. Give important properties of electric lines of force.

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77. Give important properties of electric lines of force.

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78. Sketch the electric lines of force due to point charges $q > 0$

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79. Sketch the electric lines of force due to point charges $q < 0$

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80. sketch the pattern of electric field lines due to a conducting sphere having negative harge on it and an electric dipole.

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81. Are the field lines a reality ?

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82. A charged particle is free to move in as electric field. Will it always move along an

electric line of force?

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83. Electric field itensity within a conductor is always zero. Why?

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Exercise

1. In defining electric field due to a point charge, the test charge has to be vanishingly small. How this condition can be justified, when we know that charge less than the on an electron or a proton is not possible?

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2. A ball of charge q is plaed in a hollow conductive uncharged sphere. After this, the sphere is connected with earth for a short

time and the ball is then removed from the sphere. The ball has not been brought into contact with the sphere. What charge will the sphere have after these operations? Where and how will this charge the distributed?

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3. A ball of charge q is plaed in a hollow conductive uncharged sphere. After this, the sphere is connected with earth for a short time and the ball is then removed from the

sphere. The ball has not been brought into contact with the sphere. What will be the nature of the field and how wil it be located?

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4. A sphere of charge + Q is fixed in position. A smaller sphere of charge + q is placed near the larger sphere and released from rest. The small sphere will move away from the large sphere with decreasing velocity an inreasing acceleration, decreasing velocity and

increasing acceleration, decreasing velocity and constant acceleration, increasing velocity and increasing acceleration explain, which of the following statements is correct?

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5. Graphically, represent the variation of electric field due to a point charge Q with magnitude of charge Q

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6. Graphically, represent the variation of electric field due to a point charge Q with magnitude of charge Q

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7. Graphically, represent the variation of electric field due to a point charge Q with $1/r^2$ where r is the distance of the obervation point from the charge.

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8. Three point charges, each having a charge +10 C are placed on the three cornes A, B and C of a square ABCD having each side of length $\sqrt{8}$m. Find the electric field at the centre of the square.

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9. Five point charges, each having a charge q are placed on the five croners A,B,C, D and E of a regular hexagon ABCDEF having each side of

length a. Find the electric field at the centre of the hexagon.

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10. A small metal ball of mass m is suspended from a thread of length l between the plates of a large plane capacitor. How will the period of oscillations of such a pendulum change, if a charge + q is placed on the ball and the upper plate is positively charged

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11. A small metal ball of mass m is suspended from a thread of length l between the plates of a large plane capacitor. How will the period of oscillations of such a pendulum change, if a charge + q is placed on the ball and the upper plate is negatively charged?

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12. What is the use of the concept of electric field intensity?

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13. Establish the relation between electric field strength and force.

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14. Derive an expression for electric field intensity at a distance r from a point charge q.

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15. Find the electric field intensity at any point on the axis of a uniformly charged ring or loop.

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16. What is an electric dipole? Define electric dipole moment and give its unit.

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17. Define the term electric dipole moment. Give its units Derive an expression for the maximum torque acting on an electric dipole, when held in a uniform electric field.

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18. Define electric field intensity at a point. Give its S.I. units. Derive an expression for the electric field intensity at any point on the axial line of an electric dipole.

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19. Define electric field intensity at a point. Give its S.I. units. Derive an expression for the electric field intensity at any point on the axial line of an electric dipole.

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20. Define electric field intensity at a point. Give its S.I. units. Derive an expression for the

electric field intensity at any point on the axial line of an electric dipole.

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21. Define electric field intensity at a point. Give its S.I. units. Derive an expression for the electric field intensity at any point on the axial line of an electric dipole.

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22. Obtain an expression for electric field intensity at any point on equitorial line of electric dipole. What is the direction of electric field?

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23. Define electric field intensity at a point.

Watch Video Solution

24. What is the direction of electric field at a point on the equitorial line of an electric dipole?

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25. What is the direction of electric field at a point on the equitorial line of an electric dipole?

Watch Video Solution

26. What is the direction of electric field at a point on the equitorial line of an electric dipole?

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27. Find an expression for electric intensity due to a short electric dipole at any point situated along a line inclined at an angle from the dipole axis.

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28. Define electric field intensity at a point.

Watch Video Solution

29. Find the electric field intensity at any point on the axis of a uniformly charged ring or loop.

Watch Video Solution

30. Explain the3 properties of electric lines of force.

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31. What is meant by electric lines of force represent ? Explain repulsion between two like charges on their basis.

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32. Derive an expression for torque experiencedby electric dipole in a uniform electric field

Watch Video Solution

33. Draw a labelled diagram showingt an electric dipole making an angle θ with a uniform electric field E. Derive an expression for the torque experienced by the dipole.

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34. Dedce the expression for the torque acting ona dipole of dipole moment $\vec{p}$ in the presence of a uniform electric field $\vec{E}$

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35. An electric edipole is placed in a uniform field $\vec{E}$. Show that torque $\vec{r}$ acting on the dipole is given by $\vec{r} = \vec{p} \times \vec{E}$ wehre $\vec{p}$ is dipole strength of the dipole.

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36. A dipole is placed in a uniform electric field. What is the net force and torque acting on it?

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37. Find an expression for the troque experienced by an electric dipole placed in a uniform electric field. Hence, define electric dipole moment.

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38. Derive an expression for the torque acting on an electric dipole suspended freely in a uniform electric field. How will you determine the direction of torque?

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39. An electric dipole free to move is placed in a uniform electric field. Explain with a diagram. Its motion, when it is placed parallel to the field.

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40. An electric dipole free to move is placed in a uniform electric field. Explain with a diagram. Its motion, when it is placed perpendicular to the field.

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41. Derive an expression for electric field intensity at a distance r from a point charge q.

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42. Obtain expression for electric field due to a point charge

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43. Obtain expression for electric field due to a continuous distribution of charges along a line.

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44. Obtain expression for electric field due to a continuous distribution of charge over a surface

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45. Obtain expression for electric field due to a continuous distribution of charge over a volume.

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46. Explain the terms electric dipole and dipole moment. Derive a relation for the intensity of electric field at an equitorial point of a electric dipole.

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47. Derive a relation for electric field of an electric dipole at a point on its equatorial line.

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48. What is electric field intensity? Give its SI units. Derive an expression for it at a point on the equitorial line of an electric dipole. What is field, when dipole is short?

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49. Define electric fied intensity and derive an expression for it at a point on the neuttral axis of a dipole. Also determine its direction.

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50. Derive a relation for electric field of an electric dipole at a point on its equatorial line.

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51. Prove that for a short dipoe, the intensity at a point on the axial line is twice that on the equitorial line.

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52. Define electric field intensity at a point. Give its S.I. units. Derive an expression for the electric field intensity at any point on the axial line of an electric dipole.

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53. Obtain an expression for electric field intensity at any point on equitorial line of electric dipole. What is the direction of electric field?

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54. Two point charges q and -q is placed at a distance 2a apart.Calculate the electric field at a point P situated at a distance r along the perpendicular bisector of the line joining the charges. What is the electric field when $r > > a$? Also, give the direction of electric field W.r.t. electric dipole moment? .

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55. Deduce an expression for the electric field $\vec{E}$ due to a system of two harges q_1 and q_2 with position vectors $\vec{r}_1$ and $\vec{r}_2$ at a oint $\vec{r}$ w.r.t the common origin O.

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56. Find the electric field intensity at any point on the axis of a uniformly charged ring or loop.

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57. Find the electric field intensity at any point on the axis of a uniformly charged ring or loop.

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58. A crcular loop of charge is placed in YZ-plane with its centre at the origin. Find expression for electric field at a point on X-axis.

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59. A thin circular ring of radius r is charged uniformaly so that its linear charge density becomes λ. Derive an expression for the electric for the electric field at a point P at a distance x from it along the axis of the ring. Hence, prove that at large distances (x>>r), the ring behaves as a point charge.

60. Derive an expression for torque experiencedby electric dipole in a uniform electric field

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61. Derive an expression for torque experiencedby electric dipole in a uniform electric field

Watch Video Solution

62. Draw a labelled diagram showingt an electric dipole making an angle θ with a uniform electric field E. Derive an expression for the torque experienced by the dipole.

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63. A dipole is placed in a uniform electric field. What is the net force and torque acting on it?

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64. An electric dipole is held in a uniform electric field. The dipole is aligned parallel to the field. Find the work done in rotating it through the angle of 180°

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65. An electric dipole is held in a uniform electric field Using suitable diagram, show that it does not udnergo any translatory motion

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66. Draw a labelled diagram showingt an electric dipole making an angle θ with a uniform electric field E. Derive an expression for the torque experienced by the dipole.

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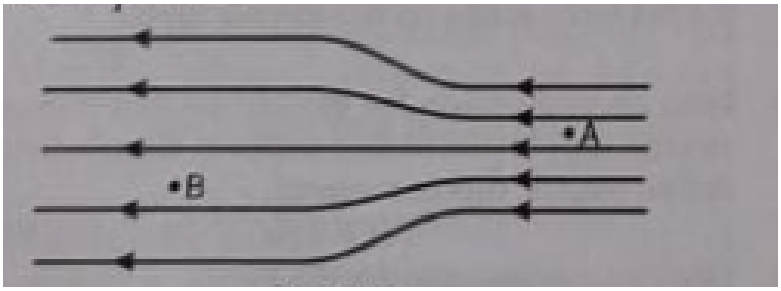
67. In the electric field show in the figure



the electric field lines on the left have twice the

separation as that between those on the right. If the magnitudes of the fields at point A is 40NC^(-1), calculate the force experienced by a proton placed at point A . Also find the magnitude of electric field at the point B.

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68. Calculate the magnitude and direction of the electric field. Which keeps a proton just floating. Give that mass of proton

1.67×10^{-27} kg, charge on proton $= 1.6 \times 10^{-19}$ C and $g = 9.8ms^{-2}$

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69. A water particle of mass 10 mg and having a charge of $1.5 \times 10^{-6}C$ stays suspended in a room. What is the magnitude and direction of the electric field in the room?

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70. An electron above the earth is balanced by the gravitational force and the electric field of the earth. Find the electric field of the earth.

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71. How many electrons should be removed from a coin of mass 1.6 g, so that it may float in an electric field of intensity $10^9 NC^{-1}$ directed upward.

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72. Find the time taken by a particle of mass 10^{-18} kg and carrying a charge 3.2×10^{-19} C to fall through a distance of 8 m in a uniform electric field of intensity $8 \times 10^{2} NC^{-1}$

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73. An electron is released with a velocity of $5 \times 10^{6} ms^{-1}$ in an electric field of $10^{3} NC^{-1}$ which ahs been applied so as to oppose it motion. What distance would the electron

travel and how much time could iyt take before it is brought to rest?

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74. A charged particle of mass 1 g is suspended through a silk thread of length 40 cm in a horizontal electric field.fo $4.0 \times 10^4 NC^{-1}$. If the particle stays at a distane of 24 cm from the wall in equilirbium, find the charge on the particle.

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75. Two points charges of $+20\mu C$ and $+80\mu C$ are plaed 18 cm apart. Find the position of the point where electric field is zero.

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76. Two point charges of $-16\mu C$ and $+80\mu C$ are placed 8 cm apart. Find the position of the point, where electric field is zero.

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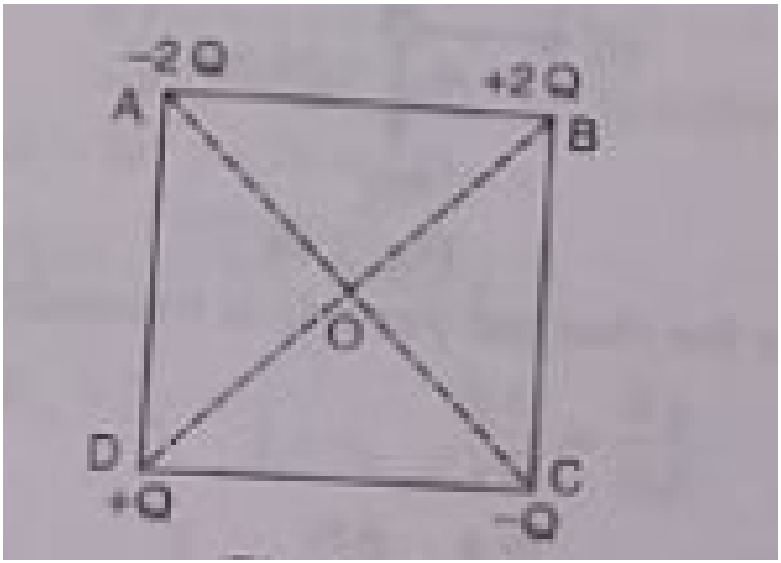
77. Shown in the figure



four point charges at the corners of a square of side 2 cm. Find the magnitude and direction of the electric field at the centre O of the square, if $Q = 0.02\mu C$ Use $\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9 Nm^2C^{-2}$

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78. Three charges, each equal to q, are placed at the three corners of a square of side a. Find the electric field at the fourth corner of the square.

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79. Four charges +q'+q' - q and -q are placed respe tively at the four croners A,B,C and D

respectively of a square of side a . Calcualte the force on a charge Q placed at the centre of the square.

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80. ABC is an equilateral triangle of side 5 cm. Charges of $+60statC$ and $-30statCare$ placed at points A and B respectively. Calcualte completely the electric field at point C. Given $1C = 3 \times 10^9 statC$

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81. Two point charges of $2\mu C$ but opposte in sign are placed 10 cm apart. Calculate the electric field at a point distant 10 cm from the mid point on the axial line of the dipole.

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82. Two charges eacdh of $0.1\mu C$ but opposite in sign are 1 mm apart. What is the electric field at a point on the line joining them at a distance of 10 cm from the mid-point?

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83. Two charges $\pm 10\mu C$ are placed 5.0 mm apart. Determine the electric field at a point on the axis of the dipole 15 cm away from its centre 0 on the side of the positive charge

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84. Two charges $\pm 10\mu C$ are placed 5.0 mm apart. Determine the electric field at a point 15

cm away from point O on a line passing through O and normal to the axis of the dipole.

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85. The electric field at a point on the axial line at a distance of 10 cm from te centre of an electric dipole is $3.75 \times 10^5 NC^{-1}$ in air, while at a distance of 20 cm, the electric field is $3 \times 10^4 NC^{-1}$. Calculate the length of the electric dipole.

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86. An electric dipole of dipole moment 4×10^{-5}C m is placed in a uniform electric field of $10^{-3} NC^{-1}$ makng an angle of 30° with the direction of field. Determine the torque exerted y the electric fieldon the dipole.

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87. An electric dipole with diple moment 4×10^{-9}C m is aligned at 30° with the direction of unifrom electric field of $5 \times 10^{-3} NC^{-1}$. Calculate magnitude of the torque acting on the dipole.

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88. A dipole consisting of an electron and a proton separated by a distance 4×10^{-10} m is situated in an electric field of intensity

$3 \times 10^5 NC^{-1}$ at an angle orf 30° with the field. Calculate the dipole moment and the torque acting on it.

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89. An electric dipole, when held at 30° with respect to a uniform electrc field of $3 \times 10^4 NC^{-1}$ experienes a troque of $27 \times 10^{25} Nm$. Calculate dipole moment of the dipole.

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90. An electric diple is placed at angle of 60° with an electric field of strength $4 \times 10^{5} NC^{-1}$. It experiences a torque equal to $8\sqrt{3} \times 10^{-5}$ Nm. Calculate the charge on the dipole, if dipole is of length 4 cm.

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91. An electric dipoel consists of two equal and opposite charges placed 2 cm apart. When the dipole is placed in a uniform electric field of

strength $10^5 NC^{-1}$, it experiences a maximum torque of $0.2 \times 10^{-3} Nm$. Find the magnitude of each charge.

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92. A copper ball of density $8.6 gcm^{-3}$ cm in diameter is immersed in oil of density $0.8 gcm^{-3}$. If the ball remains suspended in oil in a uniform electric field of intensity $36,000 NC^{-1}$ acting in upward direction, what is the charge on the ball?

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93. A charge of 4×10^{-9}C is distributed uniformly over the circumference of a conducting ring of radius 0.3 m. Calculate the field intensity at a point on the axis of the ring at 0.4 m from its centre. Also, calculate the electri field at the centre of the ring.

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94. A dipole consists of two charges $+10\mu C$ and $-10\mu C$ separated by a certain distance. Let they be located at x=6.0 cm, y = 0 and x = 6.0 cm, y= 0 respectively. Calculate the field strength at a point x = 0, y = 8 cm.

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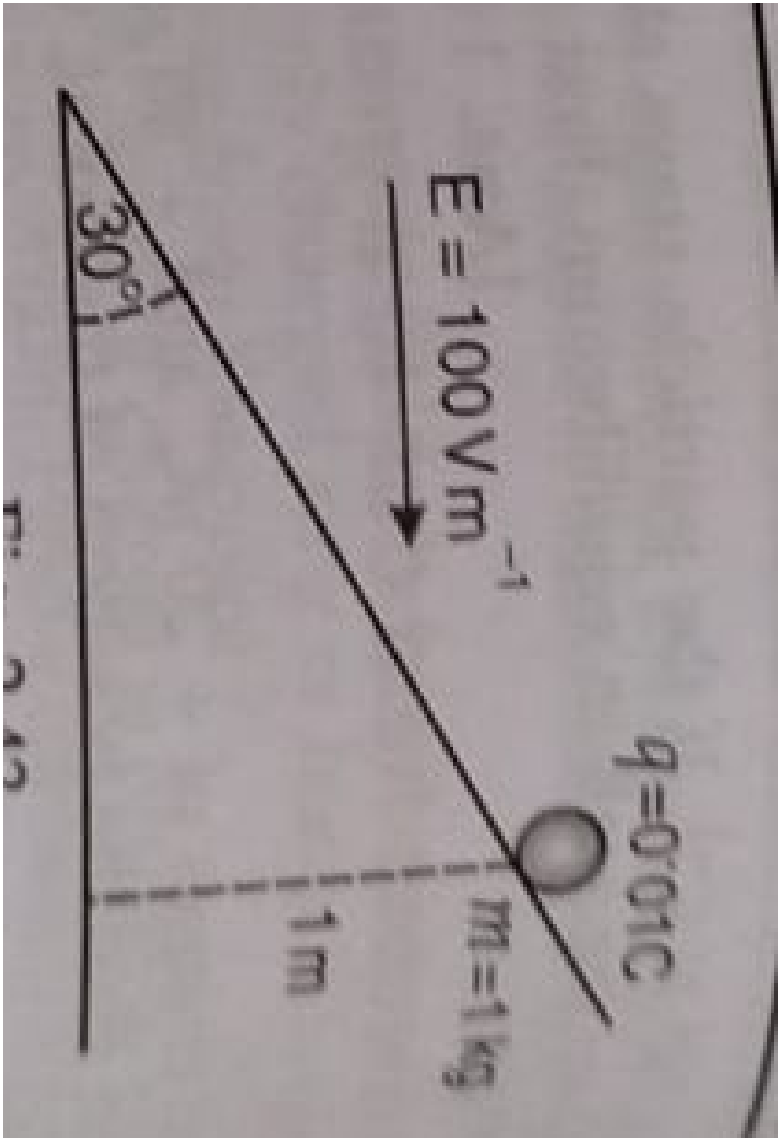
95. An inclined plane making an angle of 30° with the horizontal is placed in a uniform horizontal electric of 100 V m^{-1} as shown in

the figure



A particle of mass 1 kg and charge 0.01 C is allowed to slide down from rest from a height

of 1 m. If the coefficient of frictio nis 0.2, find the time it will take the particle to reach the bottom.

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