Test Bank

Conceptual Questions

C1. Object A has a charge q on it, object B has a charge q on it, and object C has a charge $2q$ on it. These charges are arranged, one each, at the vertices of an equilateral triangle. Which charge has the greatest magnitude electric force on it?

    a. A
    b. B
    c. C
    d. All have equal magnitude forces on them.

C2. Three equal positive charges are placed on the x-axis, one at the origin, one at $x = 2$ m, and the third at $x = 4$ m. Of the following points, which has the greatest magnitude electric field?

    a. $x = 1$ m
    b. $x = 3$ m
    c. $x = 5$ m
    d. The electric field has the same magnitude at all three positions.

C3. Charges q, q, and $-q$ are placed on the x-axis at $x = 0$, $x = 2$ m, and $x = 4$ m, respectively. At which of the following points does the electric field have the greatest magnitude?

    a. $x = 1$ m
    b. $x = 3$ m
    c. $x = 5$ m
    d. The electric field has the same magnitude at all three positions.

C4. Two small objects are suspended from threads. When the objects are moved close together, they attract one another. Which of the following could produce this result?

    a. One object is positively charged and the other is negatively charge.
    b. One object is positively charged and the other is uncharged.
    c. One object is negatively charged and the other is uncharged.
    d. All of the above could result in such attraction.

C5. A spherical surface surrounds a point charge it its center. If the charge is doubled and if the radius of the surface is also doubled, what happens to the electric flux Φ_E out of the surface and the magnitude E of the electric field at the surface as a result of these doublings?

    a. Φ_E and E do not change.
    b. Φ_E increases and E remains the same.
    c. Φ_E increases and E decreases.
    d. Φ_E increases and E increases.

15.1 Properties of Electric Charges

1. Doug rubs a piece of fur on a hard rubber rod, giving the rod a negative charge. What happens?

    a. Protons are removed from the rod.
    b. Electrons are added to the rod.
    c. The fur is also charged negatively.
    d. The fur is left neutral.

2. A repelling force must occur between two charged objects under which conditions?

    a. Charges are of unlike signs.
    b. Charges are of like signs.
    c. Charges are of equal magnitude.
    d. Charges are of unequal magnitude.

3. When a glass rod is rubbed with silk, which of the following statements best describes what happens?

    a. Electrons are removed from the rod.
    b. Protons are removed from the silk.
    c. The silk is charged positively.
    d. The silk remains neutral.

4. A metallic object holds a charge of -3.8×10^{-6} C. What total number of electrons does this represent? ($e = 1.6 \times 10^{-19}$ C is the magnitude of the electronic charge.)

    a. 4.2×10^{14}
    b. 6.1×10^{13}
    c. 2.4×10^{13}
    d. 1.6×10^{14}

5. When charging two objects by rubbing them together:

    a. Neither may be a conductor.
    b. They must be made of different material.
    c. They will sometimes end up with both being positively charged.
    d. The heat produced by friction is a necessary part of this process.

6. About how many electrons are in 30 grams of water (H_2O)?

    a. 10^{25}
    b. 10^{23}
    c. 10^{21}
    d. 10^{19}

7. Who was the first to determine the electron's charge?

    a. Franklin
    b. Coulomb
    c. Millikan
    d. Faraday

15.2 Insulators and Conductors

8. An uncharged conductor is supported by an insulating stand. I pass a positively charged rod near the left end of the conductor, but do not touch it. The right end of the conductor will be:

    a. negative.
    b. positive.
    c. neutral.
    d. attracted.

9. Of the following substances, which one contains the highest density of free electrons?

    a. hard rubber
    b. iron
    c. amber
    d. glass

10. Which of the following best characterizes electrical conductors?

    a. low mass density
    b. high tensile strength
    c. electric charges move freely
    d. poor heat conductors

11. Which of the following best characterizes electrical insulators?

    a. charges on the surface don't move
    b. high tensile strength
    c. electric charges move freely
    d. good heat conductors

12. If body M, with a positive charge, is used to charge body N by induction, what will be the nature of the charge left on the latter?

    a. must be equal in magnitude to that on M
    b. must be negative
    c. must be positive
    d. must be greater in magnitude than that on M

13. If body P, with a positive charge, is placed in contact with body Q (initially uncharged), what will be the nature of the charge left on Q?

    a. must be equal in magnitude to that on P
    b. must be negative
    c. must be positive
    d. must be greater in magnitude than that on P

14. I wish to use a positively charged rod to charge a ball by induction. Which statement is correct?

    a. The charge on the ball will be positive.
    b. The ball must be a conductor.
    c. The ball must be an insulator that is connected temporarily to the ground.
    d. The ball is charged as the area of contact between the two increases.

15. How can a charged object attract an uncharged object made of non-conducting material?

    a. The uncharged object must somehow gain a like charge.
    b. The uncharged object must somehow gain an unlike charge.
    c. The charges in the uncharged object can become polarized.
    d. Attraction of an insulator is not possible.

15.3 Coulomb's Law

16. Two point charges are 4 cm apart. They are moved to a new separation of 2 cm. By what factor does the resulting mutual force between them change?

    a. 1/2
    b. 2
    c. 1/4
    d. 4

17. If the distance between two point charges is tripled, the mutual force between them will be changed by what factor?

    a. 9.0
    b. 3.0
    c. 0.33
    d. 1/9

18. If the size of the charge value is tripled for both of two point charges maintained at a constant separation, the mutual force between them will be changed by what factor?

    a. 9.0
    b. 3.0
    c. 0.33
    d. 1/9

19. The constant k_e, which appears in Coulomb's law formula, is equivalent dimensionally to which of the following?

    a. N·m/C
    b. N/C
    c. N·m^2/C^2
    d. N/C^2

20. Two point charges, separated by 1.5 cm, have charge values of +2.0 and −4.0 μC, respectively. What is the value of the mutual force between them? ($k_e = 8.99 \times 10^9$ N·m^2/C^2)

    a. 320 N
    b. 3.6×10^{-8} N
    c. 8.0×10^{-12} N
    d. 3.1×10^{-3} N

21. Four charges are at the corners of a square, with B and C on opposite corners. Charges A and D, on the other two corners, have equal charge, while both B and C have a charge of +1.0 C. What is the charge on A so that the force on B is zero?

    a. −1.0 C
    b. −0.50 C
    c. −0.35 C
    d. −0.71 C
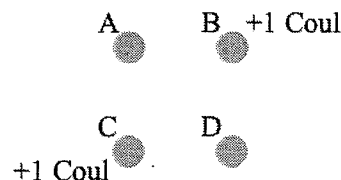
22. Charge A and charge B are 3.00 m apart, and charge A is +2.00 C and charge B is +3.00 C. Charge C is located between them at a certain point and the force on charge C is zero. How far from charge A is charge C?

    a. 0.555 m
    b. 0.667 m
    c. 1.35 m
    d. 1.50 m

23. The beam of electrons that hits the screen of an oscilloscope is moved up and down by:

    a. gravity.
    b. a phosphorescent coating.
    c. varying the electron's charge.
    d. electrical charges on deflecting plates.

24. In a thundercloud there may be an electric charge of +40 C near the top of the cloud and −40 C near the bottom of the cloud. These charges are separated by about 2.0 km. What is the electric force between these two sets of charges? ($k_e = 8.99 \times 10^9$ N·m²/C²)

     a. 3.6×10^4 N
     b. 3.6×10^5 N
     c. 3.6×10^6 N
     d. 3.6×10^7 N

25. An electron is sent at high speed toward a gold nucleus (charge +79e). What is the electrical force acting on the electron when it is 3.0×10^{-14} m away from the gold nucleus? ($e = 1.6 \times 10^{-19}$ C, $k_e = 8.99 \times 10^9$ N·m²/C²)

     a. 20 N
     b. 0.25 N
     c. 2.0×10^{-4} N
     d. 2.1×10^{-6} N

26. Two electrons are separated by one cm. What is the ratio of the electric force to the gravitational force between them? ($m_e = 9.11 \times 10^{-31}$ kg, $k_e = 8.99 \times 10^9$ N·m²/C², G = 6.67×10^{-11} N·m²/kg², and $e = 1.6 \times 10^{-19}$ C)

     a. 2.3×10^2
     b. 1.3×10^{20}
     c. 3.1×10^{22}
     d. 4.2×10^{42}

27. Two equal charges, each Q, are separated by some distance. What third charge would need to be placed half way between the two charges so that the net force on each charge would be zero?

     a. −Q
     b. −Q/2
     c. −Q/4
     d. −Q/8

28. A 6.0 μC charge is placed at the origin and a second charge is placed on the x-axis at x = 0.30 m. If the resulting force on the second charge is 5.4 N in the positive x-direction, what is the value of its charge?

     a. 9.0 μC
     b. 9.0 nC
     c. −9.0 μC
     d. −9.0 nC

29. A 6.00 μC charge is placed at the origin and a second charge is placed on the x-axis at x = 0.300 m. If the resulting force on the second charge is 6.40 N in the positive x-direction, what is the force on the charge at the origin?

    a. 6.40 N in the positive x-direction
    b. 6.40 N in the negative x-direction
   c. 0 N
    d. not able to be determined until the second charge is known

15.4 The Electric Field

30. Two point charges each have a value of 30.0 mC and are separated by a distance of 4.00 cm. What is the electric field midway between the two charges? ($k_e = 8.99 \times 10^9$ N·m^2/C^2)

    a. 40.5×10^7 N/C
    b. 20.3×10^7 N/C
    c. 10.1×10^7 N/C
    d. zero

31. Two point charges are separated by 10.0 cm and have charges of +2.00 μC and –2.00 μC, respectively. What is the electric field at a point midway between the two charges? ($k_e = 8.99 \times 10^9$ N·m^2/C^2)

    a. 28.8×10^6 N/C
    b. 14.4×10^6 N/C
    c. 7.19×10^6 N/C
    d. zero

32. Electric field is dimensionally equivalent to which of the following?

    a. N·m/C
    b. N/C
    c. N·m^2/C^2
    d. N/C^2

33. An electron with a charge value of 1.6×10^{-19} C is moving in the presence of an electric field of 400 N/C. What force does the electron experience?

    a. 2.3×10^{-22} N
    b. 1.9×10^{-21} N
    c. 6.4×10^{-17} N
    d. 4.9×10^{-17} N

34. Charges of 4.0 μC and –6.0 μC are placed at two corners of an equilateral triangle with sides of 0.10 m. At the third corner, what is the electric field magnitude created by these two charges? ($k_e = 8.99 \times 10^9$ N·m²/C²)

     a. 4.5×10^6 N/C
     b. 3.1×10^6 N/C
     c. 1.6×10^6 N/C
     d. 4.8×10^6 N/C

35. The average distance of the electron from the proton in the hydrogen atom is 0.51×10^{-10} m. What is the electric field from the proton's charge at the location of the electron? ($k_e = 8.99 \times 10^9$ N·m²/C², $e = 1.6 \times 10^{-19}$ C)

     a. 5.5×10^{11} N/C
     b. 1.0×10^6 N/C
     c. 3.2×10^2 N/C
     d. 8.8×10^{-8} N/C

36. Two point charges are placed along a horizontal axis with the following values and positions: +3.0 μC at $x = 0$ cm and –7.0 μC at $x = 20$ cm. At what point along the x axis is the electric field zero?

     a. 8.0 cm
     b. –44 cm
     c. –69 cm
     d. –38 cm

37. A proton initially moves left to right long the x axis at a speed of 2.00×10^3 m/s. It moves into an electric field, which points in the negative x direction, and travels a distance of 0.200 m before coming to rest. What acceleration magnitude does the proton experience?

     a. 6.67×10^3 m/s²
     b. 1.00×10^7 m/s²
     c. 9.33×10^9 m/s²
     d. 2.67×10^{11} m/s²

38. A proton initially moves left to right long the x axis at a speed of 2.00×10^3 m/s. It moves into an electric field, which points in the negative x direction, and travels a distance of 0.200 m before coming to rest. If the proton's mass and charge are 1.67×10^{-27} kg and 1.60×10^{-19} C respectively, what is the magnitude of the electric field?

     a. 28.3   N/C
     b. 13.9   N/C
   c. 0.104 N/C
     d. 0.038 N/C

39. Two charges, $+Q$ and $-Q$, are located two meters apart and there is a point along the line that is equidistant from the two charges as indicated. Which vector best represents the direction of the electric field at that point?

   a. Vector E_A
   b. Vector E_B
   c. Vector E_C
   d. The electric field at that point is zero.
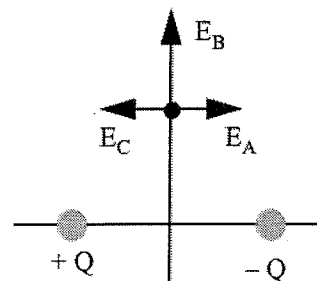
40. A charge of $+2$ C is at the origin. When charge Q is placed at 2 m along the positive x axis, the electric field at 2 m along the negative x axis becomes zero. What is the value of Q?

   a. -3 C
   b. -6 C
   c. -7 C
   d. -8 C
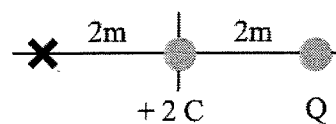
41. An electron with a speed of 2.0×10^6 m/s moves into a uniform electric field of 500 N/C that is parallel to the electron's motion. How long does it take to bring the electron to rest? ($m_e = 9.11 \times 10^{-31}$ kg, $e = 1.6 \times 10^{-19}$ C)

   a. 2.3×10^{-8} s
   b. 3.5×10^{-8} s
   c. 1.2×10^{-7} s
   d. 2.3×10^{-6} s

42. In x-ray machines, electrons are subjected to electric fields as great as 6.0×10^5 N/C. Find an electron's acceleration in this field. ($m_e = 9.11 \times 10^{-31}$ kg, $e = 1.6 \times 10^{-19}$ C)

   a. 1.1×10^{17} m/s^2
   b. 5.4×10^{13} m/s^2
   c. 4.6×10^{10} m/s^2
   d. 3.6×10^8 m/s^2

43. A proton moving at 3.0×10^4 m/s is projected at an angle of 30° above a horizontal plane. If an electric field of 400 N/C is acting down, how long does it take the proton to return to the horizontal plane? (Hint: Ignore gravity. $m_{proton} = 1.67 \times 10^{-27}$ kg, $q_{proton} = 1.6 \times 10^{-19}$ C)

   a. 7.8×10^{-7} s
   b. 1.7×10^{-6} s
   c. 3.9×10^{-6} s
   d. 7.8×10^{-6} s

44. An airplane is flying through a thundercloud at a height of 2 000 m. (This is a very dangerous thing to do because of updrafts, turbulence, and the possibility of electric discharge.) If there is a charge concentration of +40 C at height 3 000 m within the cloud and −40 C at height 1 000 m, what is the magnitude of the electric field E at the aircraft? ($k_e = 8.99 \times 10^9$ N·m^2/C^2)

      a. 90 000 N/C
      b. 180 000 N/C
      c. 360 000 N/C
      d. 720 000 N/C

45. Electrons in a particle beam each have a kinetic energy of 3.2×10^{-17} J. What is the magnitude of the electric field that will stop these electrons in a distance of 0.1 m? ($e = 1.6 \times 10^{-19}$ C)

      a. 200 N/C
      b. 1 000 N/C
      c. 2 000 N/C
      d. 4 000 N/C

46. The electric field in a cathode ray tube is supposed to accelerate electrons from 0 to 1.60×10^7 m/s in a distance of 2.00 cm. What electric field is required? ($m_e = 9.11 \times 10^{-31}$ kg and $e = 1.60 \times 10^{-19}$ C)

      a. 9 110 N/C
      b. 18 200 N/C
      c. 36 400 N/C
      d. 72 800 N/C

47. The electric field of a point charge has an inverse _____ behavior.

      a. $r^{1/2}$
      b. r
      c. r^2
      d. r^3

15.5 Electric Field Lines

48. The number of electric field lines passing through a unit cross sectional area is indicative of:

      a. field direction.
      b. charge density.
      c. field strength.
      d. charge motion.

49. Two point charges, separated by 1.5 cm, have charge values of +2.0 and −4.0 μC, respectively. Suppose we determine that 10 field lines radiate out from the +2.0-μC charge. If so, what might be inferred about the −4.0-μC charge with respect to field lines?

     a. 20 radiate out
     b. 5 radiate out
     c. 20 radiate in
     d. 10 radiate in

50. Charge A has 10 electric field lines coming out, Charge B has 20 lines coming out, and Charge C has 30 lines coming in. Which pair of these charges will have the largest force between them if placed one cm apart?

     a. A and B
     b. B and C
     c. C and A
     d. More information is needed.

51. Q_1 has 50 electric field lines radiating outward and Q_2 has 100 field lines converging inward. What is the ratio Q_1/Q_2?

     a. 2
     b. −2
     c. 1/2
     d −1/2

15.6 Conductors in Electrostatic Equilibrium

52. Relative distribution of charge density on the surface of a conducting solid depends on:

     a. the shape of the conductor.
     b. mass density of the conductor.
     c. type of metal of which the conductor is made.
     d. strength of the earth's gravitational field.

53. The electric field at the surface of a positively charged conductor has a direction characterized by which of the following?

     a. tangent to the surface
     b. perpendicular inward toward the charge
     c. at a 45° angle to the surface
     d. perpendicular outward and away from the charge

54. The electric field associated with a uniformly charged hollow metallic sphere is the greatest at:

     a. the center of the sphere.
     b. the sphere's inner surface.
     c. infinity.
     d. the sphere's outer surface.

55. At what point is the charge per unit area greatest on the surface of an irregularly shaped conducting solid?

     a. where surface curves inward
     b. where surface is flat
     c. where curvature is least
     d. where curvature is greatest

56. An initially uncharged hollow metallic sphere with radius of 5 cm has a small object with a charge of $+10\ \mu C$ carefully placed at the center of the sphere through a hole in the latter's surface. With the charge in place, what charge is now present on the outside surface of the sphere?

     a. zero
     b. $-10\ \mu C$
     c. $+4\ 000\ \mu C$
     d. $+10\ \mu C$

57. An initially uncharged hollow metallic sphere with radius of 5 cm has a small object with a charge of $+10\ \mu C$ carefully placed at the center of the sphere through a hole in the latter's surface. What charge resides inner surface of the sphere?

     a. $-4\ 000\ \mu C$
     b. $-10\ \mu C$
     c. $+10\ \mu C$
     d. zero

58. We have an initially uncharged hollow metallic sphere with radius of 5.0 cm. I place a small object with a charge of $+10\ \mu C$ at the center of the sphere through a hole in the surface. Find the electric field present at a point 10 cm from the sphere's center. $(k_e = 8.99 \times 10^9\ N \cdot m^2/C^2)$

     a. $1.1 \times 10^6\ N/C$
     b. $2.3 \times 10^6\ N/C$
     c. $9.0 \times 10^6\ N/C$
     d. $36 \times 10^6\ N/C$

59. We have a hollow metallic sphere with charge $-5.0\ \mu C$ and radius 5.0 cm. We insert a $+10$-μC charge at the center of the sphere through a hole in the surface. What charge now rests on the outer surface of the sphere?

     a. $+5\ \mu C$
     b. $+10\ \mu C$
     c. $+15\ \mu C$
     d. $-5\ \mu C$

60. Two identical spheres each carry a charge of $-40.0\ \mu C$. The spheres are separated by a distance of 1.00 m. What is the electric force between the spheres? ($k_e = 8.99 \times 10^9\ \mathrm{N \cdot m^2/C^2}$)

     a. 28.8 N (repulsive)
     b. 14.4 N (repulsive)
     c. 7.19 N (attractive)
     d. 43.2 N (attractive)

61. A ping-pong ball covered with a conducting graphite coating has a mass of 5.0×10^{-3} kg and a charge of $4.0\ \mu C$. What electric field directed upward will exactly balance the weight of the ball? ($g = 9.8\ \mathrm{m/s^2}$)

     a. 8.2×10^2 N/C
     b. 1.2×10^4 N/C
     c. 2.0×10^{-7} N/C
     d. 5.1×10^6 N/C

62. Two identical iron spheres have equal positive charges and the force between them when they are 1 m apart is 1 N. What percentage of the electrons has been removed from each sphere if each sphere has 1 mole (6×10^{23}) of iron atoms? ($k_e = 8.99 \times 10^9\ \mathrm{N \cdot m^2/C^2}$, the atomic number of iron is 26, and the electron charge is -1.6×10^{-19} C)

     a. 0.001%
     b. 0.000 002%
     c. 1×10^{-8} %
     d. 4×10^{-10} %

63. Two identical balls have the same amount of charge, but the charge on ball A is positive and the charge on ball B is negative. The balls are placed on a smooth, level, frictionless table whose top is an insulator. Which of the following is true?

     a. Since the force on A is equal but opposite to the force on B, they will not move.
     b. They will move together with constant acceleration.
     c. Since the force on both balls is negative, they will move in the negative direction.
     d. None of the above is correct.

64. If a conductor is in electrostatic equilibrium near an electrical charge:

    a. the total charge on the conductor must be zero.
    b. the electric field inside the conductor must be zero.
    c. any charges on the conductor must be uniformly distributed.
    d. the sum of all forces between the conductor and the charge must be zero.

65. If a charge $+Q$ is placed inside a hollow isolated conductor that is originally neutral and the charge does not touch that conductor at any time:

    a. the inside surface of the conductor will become positively charged.
    b. the outside surface of the conductor will become positively charged.
    c. both the inner and outer surfaces will remain neutral.
    d. both the inner and outer surfaces will become negative.

66. A thin uncharged conducting spherical shell has a charge q carefully placed at its center through a small hole in the shell. The charge q does not touch the shell. What is the charge on the shell?

    a. q
    b. −q
    c. 2q
    d. 0

67. The combination of two separated point charges of opposite sign but equal magnitude is called an electric:

    a. monopole.
    b. dipole.
    c. quadrapole.
    d. magnapole.

15.7 The Millikan Oil-Drop Experiment

68. The Millikan oil-drop experiment demonstrated that:

    a. small oil drops fall slowly through the air.
    b. light beams can be used to illuminate small oil droplets.
    c. the electronic charge is quantized.
    d. falling oil droplets reach terminal speed.

69. In the Millikan oil-drop experiment it was found that oil droplets:

    a. could only have positive net charge.
    b. could only have negative net charge.
    c. could only have negative or zero net charge.
    d. could have positive, negative, or zero net charge.

70. In Millikan's oil drop experiment, if the electric field between the plates was of just the right magnitude, it would exactly balance the weight of the drop. Suppose a tiny spherical oil droplet of radius 1.6×10^{-4} cm carries a charge equivalent to one electron. What electric field is required to balance the weight? (The density of oil is 0.85 g/cm^3, $e = 1.6 \times 10^{-19}$ C.)

     a. 1.1×10^5 N/C
     b. 2.2×10^5 N/C
     c. 4.5×10^5 N/C
     d. 8.9×10^3 N/C

15.8 The Van de Graaff Generator

71. A charge Q accumulates on the hollow metallic dome, of radius R, of a Van de Graaff generator. A probe measures the electric field strength at various points outside the sphere surface. If the probe is initially at a distance $3R$ from the sphere's center and then is moved to $4R$, by what factor will the electric field reading change?

     a. $(4/3)^2$
     b. $4/3$
     c. $3/4$
     d. $(3/4)^2$

72. A charge Q accumulates on the hollow metallic dome, of radius R, of a Van de Graaff generator. A probe measures the electric field strength at various points outside the sphere surface. By what factor will the electric field value at the $2R$ distance be changed if the charge value were increased to $(4/3)Q$?

     a. $(4/3)^2$
     b. $4/3$
     c. $3/4$
     d. $(3/4)^2$

73. A Van de Graaff generator has a spherical dome of radius 20 cm. Operating in dry air, where "atmospheric breakdown" is at $E_{max} = 3.0 \times 10^6$ N/C, what is the maximum charge that can be held on the dome? ($k_e = 8.99 \times 10^9$ N·m^2/C^2)

     a. 2.7×10^{-5} C
     b. 1.3×10^{-5} C
     c. 2.6×10^{-6} C
     d. 1.2×10^{-6} C

15.9 Electric Flux and Gauss's Law

74. A charge, $+Q$, is placed inside a balloon and the balloon is inflated. As the radius of the balloon r increases the number of field lines going through the surface of the balloon:

     a. increases proportional to r^2.
     b. increases proportional to r.
     c. stays the same.
     d. decreases as $1/r$.

75. A spherical volume of space has an electric field of intensity 100 N/C directed radially outward from it surface of radius 0.600 m. What is the net charge enclosed within this surface?

     a. 6.8 nC
     b. 4.0 nC
     c. −6.8 nC
     d. −4.0 nC

76. A closed surface contains the following point charges: 6 C, 4 C, −2 C, −4 C. The electric flux coming out of the surface is:

     a. $16 \, C/\varepsilon_0$.
     b. $-16 \, C/\varepsilon_0$.
     c. $4 \, C/\varepsilon_0$.
     d. $-4 \, C/\varepsilon_0$.

Chapter 15 - Answers

#	Ans	Difficulty	#	Ans	Difficulty
C1.	C	2	37.	B	2
C2.	C	2	38.	C	2
C3.	B	3	39.	A	2
C4.	D	1	40.	D	2
C5.	C	2	41.	A	2
1.	B	1	42.	A	2
2.	B	1	43.	A	3
3.	A	1	44.	D	2
4.	C	2	45.	C	2
5.	B	1	46.	C	2
6.	A	3	47.	C	1
7.	C	1	48.	C	1
8.	B	1	49.	C	2
9.	B	1	50.	B	2
10.	C	1	51.	D	2
11.	A	1	52.	A	1
12.	B	2	53.	D	1
13.	C	1	54.	D	1
14.	B	1	55.	D	1
15.	C	1	56.	D	2
16.	D	1	57.	B	2
17.	D	1	58.	C	2
18.	A	1	59.	A	3
19.	C	1	60.	B	2
20.	A	2	61.	B	2
21.	C	3	62.	D	3
22.	C	3	63.	D	2
23.	D	1	64.	B	1
24.	C	2	65.	B	2
25.	A	2	66.	D	1
26.	D	2	67.	B	1
27.	C	2	68.	C	1
28.	A	2	69.	D	1
29.	B	2	70.	D	2
30.	D	2	71.	D	2
31.	B	2	72.	B	2
32.	B	1	73.	B	3
33.	C	2	74.	C	1
34.	D	3	75.	B	2
35.	A	2	76.	C	2
36.	D	3			