

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question

- 1) Materials in which the electrons are bound very loosely to the nuclei and can move about freely within the material are referred to as 1) _____
- 2) A neutral atom always has 2) _____
- 3) A 5.0-C charge is 10 m from a small test charge. What is the magnitude of the force experienced by a 1.0 nC charge placed at the location of the test charge? 3) _____
- 4) A 5.0-C charge is 10 m from a small test charge. What is the magnitude of the electric field at the location of the test charge? 4) _____
- 5) An atom has more electrons than protons. The atom is 5) _____
- 6) Two point charges, separated by 1.5 cm , have charge values of 2.0 and $-4.0\text{ }\mu\text{C}$, respectively. What is the magnitude of the electric force between them? 6) _____
- 7) An electron and a proton are separated by a distance of 1.0 m . What happens to the magnitude of the force on the proton if a second electron is placed next to the first electron? 7) _____
- 8) Three point charges are located at the following positions: $Q_1 = 2.00\text{ }\mu\text{C}$ at $x = 1.00\text{ m}$; $Q_2 = 3.00\text{ }\mu\text{C}$ at $x = 0$; $Q_3 = -5.00\text{ }\mu\text{C}$ at $x = -1.00\text{ m}$. What is the magnitude of the force on the $3.00\text{-}\mu\text{C}$ charge? 8) _____
- 9) Two charged objects are separated by a distance d . The first charge is larger in magnitude than the second charge. 9) _____
- 10) The force between a $30\text{-}\mu\text{C}$ charge and a $-90\text{-}\mu\text{C}$ charge is 1.8 N . How far apart are they? 10) _____
- 11) At twice the distance from a point charge, the strength of the electric field 11) _____
- 12) An electron and a proton are separated by a distance of 1.0 m . What happens to the size of the force on the proton if the electron is moved 0.50 m closer to the proton? 12) _____
- 13) Is it possible for two negative charges to attract each other? 13) _____
- 14) A glass rod is rubbed with a piece of silk. During the process the glass rod acquires a positive charge and the silk 14) _____
- 15) Two 1.0-C charges have a force between them of 1.0 N . How far apart are they? 15) _____
- 16) Materials in which the electrons are bound very tightly to the nuclei are referred to as 16) _____
- 17) A piece of plastic has a net charge of $+2.00\text{ }\mu\text{C}$. How many more protons than electrons does this piece of plastic have? 17) _____

- 18) Can electric field lines intersect in free space? 18) _____
- 19) A 1.0-C charge is 15 m from a second charge, and the force between them is 1.0 N. What is the magnitude of the second charge? 19) _____
- 20) A 5.0-C charge is 10 m from a small test charge. What is the direction of the electric field? 20) _____
- 21) An atomic nucleus has a charge of $+40e$. What is the magnitude of the electric field at a distance of 1.0 m from the nucleus? 21) _____
- 22) Two charges are separated by a distance d and exert mutual attractive forces of F on each other. If the charges are separated by a distance of $d/3$, what are the new mutual forces? 22) _____
- 23) The charge carried by one electron is $e = -1.6 \times 10^{-19}$ C. The number of electrons necessary to produce a charge of -1.0 C is 23) _____
- 24) Three identical point charges of $2.0 \mu\text{C}$ are placed on the x -axis. The first charge is at the origin, the second to the right at $x = 50$ cm, and the third is at the 100 cm mark. What are the magnitude and direction of the electrostatic force which acts on the charge at the origin? 24) _____
- 25) The electric field shown 25) _____

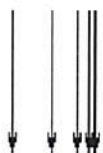


FIGURE 16-2

- 26) Electric field lines near positive point charges 26) _____
- 27) A proton carries a 27) _____
- 28) Two point charges, initially 2.0 cm apart, experience a 1.0-N force. If they are moved to a new separation of 8.0 cm, what is the electric force between them? 28) _____
- 29) Two charged objects attract each other with a certain force. If the charges on both objects are doubled with no change in separation, the force between them 29) _____
- 30) Three point charges are placed on the x -axis. A charge of $+2.0 \mu\text{C}$ is placed at the origin, $-2.0 \mu\text{C}$ to the right at $x = 50$ cm, and $+4.0 \mu\text{C}$ at the 100 cm mark. What are the magnitude and direction of the electrostatic force which acts on the charge at the origin? 30) _____
- 31) What are the magnitude and direction of the electric field at a distance of 1.50 m from a 50.0-nC charge? 31) _____

Answer Key

Testname: ELECTRO FINAL PRACTICE

- 1) conductors.
- 2) the same number of protons as electrons.
- 3) 0.45 N
- 4) 4.5×10^8 N/C
- 5) a negative ion.
- 6) 320 N
- 7) It doubles.
- 8) 0.189 N
- 9) The charges exert forces on each other equal in magnitude and opposite in direction
- 10) 3.7 m
- 11) is one-fourth its original value.
- 12) It increases to 4 times its original value.
- 13) No, they will never attract.
- 14) acquires a negative charge.
- 15) 95 km
- 16) insulators.
- 17) 1.25×10^{13}
- 18) No.
- 19) 25 nC
- 20) away from the 5.0 C
- 21) 5.8×10^{-8} N/C
- 22) 9F
- 23) 6.25×10^{18} .
- 24) 0.18 N left
- 25) increases to the right.
- 26) radiate outward.
- 27) positive charge.
- 28) 1/16 N
- 29) quadruples.
- 30) 0.072 N right
- 31) 200 N/C away from the charge