Final Electro Review

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 μC, 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 μC at x = 1.00 m; Q_2 = 3.00 μC at x = 0; Q_3 = -5.00 μC at x = -1.00 m. What is the magnitude of the force on the 3.00-μC 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-μC charge and a -90-μC 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 μC. 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 μC 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 psitive 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 μC is placed at the origin, –2.0 μC to the right at x = 50 cm, and +4.0 μC 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