Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Chapter 18 Test A

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. All of the following are types of fields EXCEPT:
a. gravity.
b. light.
c. magnetism.
d. mass.

____ 2. The strength of a field:
a. decreases the farther you get from the source.
b. increases the farther you get from the source.
c. stays the same throughout.
d. varies randomly throughout.

____ 3. Compared to an electric or gravitational field, the strength of a magnetic field:
a. increases more quickly as you get farther from the source.
b. decreases more quickly as you get farther from the source.
c. is identical.
d. None of the above

____ 4. The force of gravity you feel from Earth reaches you through:
a. Earth's magnetic field.
b. Earth's core.
c. Earth's gravitational field.
d. electromagnetic waves.

____ 5. What type of field surrounds a moving charged particle?
a. Electric field only
b. Magnetic field only
c. Gravitational field only
d. All of the above

____ 6. If an object with a charge of 0.05 coulombs experiences an electric force of 5 newtons, the electric field strength in newtons/coulomb is ____ N/C.
a. 0.01
b. 0.25
c. 100
d. 500

____ 7. Gravitational fields and electric fields are similar in all the following ways EXCEPT:
a. their intensities follow an inverse square law.
b. they are both vector fields.
c. they are both force fields.
d. they both are created by mass.

____ 8. How does the intensity of light 2 meters from a light bulb compare to the intensity 4 meters away from the light bulb?
a. It is 2 times more intense.
b. It is 2 times less intense.
c. It is 4 times more intense.
d. It is 4 times less intense.

____ 9. The greatest speed at which a field can spread forces, energy, or information is ____ m/s.
a. 100,000
b. 300,000,000
c. 9.8
d. There is no limit to the speed.

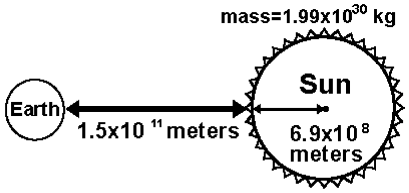


Figure-18A
The distance between the Sun and Earth is 1.5×10^{11} meters.
The mass of the Sun is 1.99×10^{30} kg.
The radius of the Sun is 6.9×10^{8} meters.
Answer the following questions about the Sun-Earth system.

____ 10. Referencing the information in Figure-18A, how long does it take the light produced by the Sun to travel to your eyes on Earth?
a. 0.002 seconds
b. 4.5×10^{19} seconds
c. 500 seconds
d. Instantly

____ 11. Referencing Figure-18A, if the Sun were to explode, how long would it be before the explosion would be seen on Earth?
a. 0.002 seconds
b. 4.5×10^{19} seconds
c. 500 seconds
d. instantly

____ 12. Referencing Figure-18A, if the Sun were to explode and vanish, which of the following would happen to Earth?
a. Earth would immediately explode and vanish.
b. Earth would fly out of its orbit after a 500-second delay.
c. Earth would fly out of its orbit immediately.
d. No change would occur.

____ 13. Referencing Figure-18A, the gravitational field strength **due to the Sun** at the surface of Earth is ____ N/kg.
a. 9.8
b. 8.9×10^{8}
c. 7.5×10^{-19}
d. 0.006

____ 14. Referencing Figure-18A, the gravitational field (value of *g*) on the surface of the Sun is ____ N/kg.
a. 1.9×10^{11}
b. 6.67×10^{-11}
c. 279
d. 9.5×10^{47}

____ 15. The gravitational field (value of *g*) at the surface of a 0.045 kg golf ball with a radius of 0.021 meters is ____ N/kg.
a. 6.67×10^{-11}
b. 1.4×10^{-10}
c. 9.8
d. 6.8×10^{-9}

____ 16. What creates an electric field?
a. Drift speed
b. The forces between charged particles
c. Magnetic attractions
d. The forces between masses

____ 17. What happens to an electric field as you get farther away from the charge that creates the field?
a. It changes to a magnetic field.
b. It decreases.
c. It increases.
d. None of the above

____ 18. The electric field inside a conductor that is NOT carrying current is:
a. increasing.
b. zero.
c. positive.
d. negative.

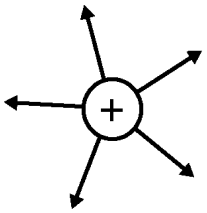
____ 19. Electric field lines always point:
a. away from positive charge and toward negative charge.
b. toward positive charge and away from negative charge.
c. across each other.
d. to the inside of a conductor.

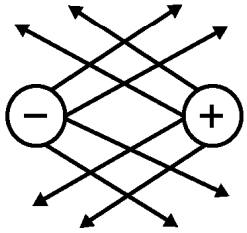
____ 20. Placing a conductor into an electric field creates a:
a. shielding effect with no electric field inside the conductor.
b. current inside the conductor.
c. negative charge inside the conductor.
d. positive charge inside the conductor.

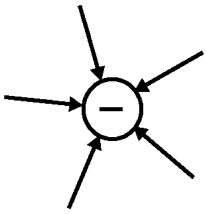
____ 21. The force in newtons of an electric field of strength 2.0 newtons/coulomb on a positive charge of 0.5 coulombs is ____ N.
a. 0.25
b. 0.5
c. 1.0
d. 4.0

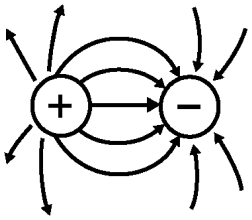
____ 22. An object with charge of 5×10^{-9} C experiences an upward force of 20×10^{-9} N when placed at a certain point in an electric field. The electric field strength at that point is ____ N/C.
a. 0.25
b. 4.0
c. 100
d. 4×10^{-9}

____ 23. Which of the following diagrams is NOT a possible representation of an electric field?

a. 

c. 

b. 

d. 

____ 24. An electric field has a strength of 2 volts/meter. It exerts a force of ____ N on a positive charge of 0.002 coulombs.

a. 9.8
b. 0.004
c. 1,000
d. 0.001

____ 25. A negative charge of 0.01 coulombs is in a 200 volts/meter electric field. The force on the charge is ____ newtons.

a. 9.8
b. 2
c. 20,000
d. 5×10^{-5}

____ 26. Which of the following is a unit used to measure the strength of an electric field?

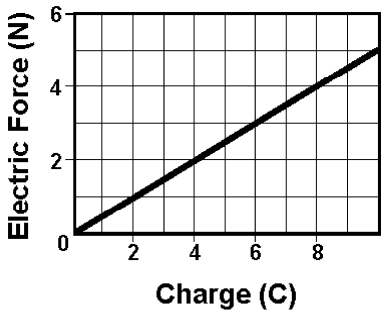
a. $\frac{\text{volts}}{\text{meter}}$

b. $\frac{\text{newtons}}{\text{coulomb}}$

c. $\frac{\text{kilograms} \times \text{meters}}{\text{seconds}^2 \times \text{coulombs}}$

d. All of the above

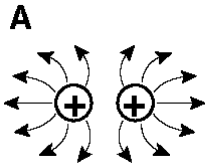
____ 27.

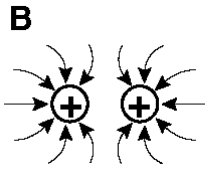


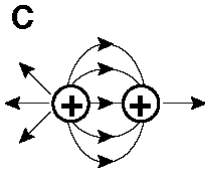
The graph represents the relationship between electric force and the charge of an object. The slope of the graph represents:

a. the strength of the electric field.
b. Coulomb's constant, $k = 9 \times 10^9$ N×m^2/C^2.
c. momentum.
d. voltage.

____ 28. The electric field around two positive charges looks most like:

a. 

b. 

c. 

d.