Test 3 review

1. An electron situated near another electron would feel
A. a repulsive electrical force.
B. an attractive electrical force.
C. a repulsive magnetic force.
D. an attractive magnetic force.
E. no forces from the other electron.

2. An atom has
A. just as many electrons as protons.
B. no neutrons in the nucleus.
C. more protons than electrons.
D. as many electrons as protons and neutrons combined.
E. at least 1 neutron.

3. Comparing the electrostatic force and the gravitational force we can say that
A. both have the same dependence on distance, both involve attraction and repulsion, but the gravitational force is stronger.
B. both have the same dependence on distance, both involve attraction and repulsion, but the electrostatic force is stronger.
C. both have the same dependence on distance, the electrostatic force can be either attractive or repulsive while the gravitational force is only repulsive, and the electrostatic force is weaker.
D. both have the same dependence on distance, the electrostatic force can be either attractive or repulsive while the gravitational force is only attractive, and the electrostatic force is stronger.
E. the electrostatic force falls off more rapidly with distance, the electrostatic force can be either attractive or repulsive while gravitation is only attractive, and the electrostatic force is stronger.

4. The current (measured in amperes) in a circuit is
A. the amount of charge (measured in Coulombs) that passes a point (in the circuit) in 1 second.
B. the amount of the total energy carried by 1 Coulomb of charge.
C. the total number of electrons in the circuit.
D. never lethal if the current is due to positive charges.

5. A certain kind of lightbulb carries 0.5 amperes of current when connected to a 120 volt AC circuit. What is its power rating?
A. 60 W.
B. 75 W.
C. 100 W.
D. 240 W.

6. In many ways, an electric circuit is like the plumbing system in your home. The voltage on an electric circuit corresponds to the _____ in a plumbing system.
A. drain
B. trap
C. pressure
D. faucet or valve

7. One ampere is equivalent to
A. 1 V/m.
B. 1 N/C.
C. 1 J/s.
D. 1 C/s.
E. 1 ohm/volt.

8. When you pay your electric bill, what are you paying for, exactly?
A. The voltage you used the previous month.
B. The electrical charge you used the previous month.
C. The electrical power you used the previous month.
D. The electrical energy you used the previous month.
E. None of these.

9. An iPod uses 3.7 volts with direct current of 865 milliamps. What is the equivalent resistance of the entire iPod system?
A. 8.4 ohms.
B. 3200 ohms.
C. 1 ohm.
D. 4.3 ohms.

10. Which of these will always produce a magnetic field?
A. A negative charge at rest
B. A positive charge at rest
C. Another magnetic field
D. A moving charge

11. A permanent magnet is produced when
A. electrons become stuck and cease to move.
B. magnetic fields of large groups of individual atoms are permanently aligned.
C. current is made to circulate in a clockwise direction in a loop of wire.
D. electrical fields exchange electrons with the magnetic fields.

12. A current flowing through a long, straight wire causes a magnetic field that points
A. radially outward from the wire.
B. radially inward toward the wire.
C. along the wire.
D. along concentric circles around the wire.

13. A magnetic compass points towards the north geographic pole of the Earth because
A. all magnetic poles, north or south, point that way due to the spin of the Earth.
B. there is a north magnetic pole near the north geographic pole.
C. there is a south magnetic pole near the north geographic pole.
D. the static electricity in the atmosphere causes the alignment of the compass.

14. Magnetic fields affect
A. only electric charges at rest.
B. only electric charges in motion.
C. both electric charges in motion and electric charges at rest.
D. neither electric charges in motion nor electric charges at rest.

15. The primary difference between infrared and visible light is that
A. they have different amplitudes.
B. infrared travels faster than visible light.
C. they have different wavelengths.
D. infrared does not have a magnetic field associated with its electric field.
E. no materials currently known have the ability to reflect infrared.

16. For visible light, which property of visible electromagnetic waves changes with color?
A. Amplitude.
B. Frequency.
C. Wavelength.
D. Amplitude and frequency.
E. Frequency and wavelength.

17. The daytime sky is blue, on sunny days, because the atmosphere
A. is most efficient at scattering red light.
B. absorbs blue light.
C. is more efficient at scattering blue light.
D. absorbs the red light.
E. contains small amounts of water vapor that give the air its blue color.

18. A property of electromagnetic waves that makes them different than other kinds of waves such as sound or water waves is that
A. they are transverse waves.
B. they do not require a medium.
C. their speed can change when moving in different media.
D. they have many possible wavelengths.

19. Under the correct conditions, two light waves can produce regions of reinforcement and regions of cancellation. This phenomenon is known as
A. polarization.
B. interference.
C. reflection.
D. refraction.

20. The polarization of a light wave is determined by the direction
A. of the light's velocity.
B. perpendicular to both the electric and magnetic fields.
C. of the oscillating electric field.
D. of the fluorescent tube used as a light source.

21. Polaroid sunglasses are designed to transmit primarily
A. horizontally polarized light.
B. vertically polarized light.
C. longitudinal light waves.
D. refracted waves.
E. light other than blue.

22. If a person has a shiny nose, applying powder will remove the shine without reducing the amount of light reflecting from the nose. This is an example of
A. polarization.
B. diffraction.
C. diffuse reflection.
D. specular reflection.

23. Which of the following types of radiation diffracts most when it passes through a diffraction grating?
A. Red.
B. Yellow.
C. Blue.
D. Violet.

24. When light enters a medium with a higher index of refraction it
A. is absorbed.
B. is bent away from the normal.
C. is bent towards the normal.
D. continues in the same direction.

25. When light is reflected from a smooth, plane mirror
A. most of the light is scattered into multiple directions.
B. the angle of reflection is the same as the angle of incidence.
C. the light is changed to a lower frequency.
D. the wave characteristics are predominant.

26. The unaided nearsighted human eye focuses light from a distant object
A. behind the retina.
B. in front of the retina.
C. on the retina.
D. acceptably but is too short for the focusing power of the cornea.

Reflection and Refraction