

Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Light will almost always travel from one place to another along a path of least
 - A) distance.
 - B) effort.
 - C) time.
 - D) complication.
 - E) expense.

- 2) Object and image for a plane mirror lie
 - A) equal distances from the mirror.
 - B) along the same plane.
 - C) at right angles to each other.
 - D) all of these
 - E) none of these

- 3) Diffuse reflection occurs when the size of surface irregularities is
 - A) large compared to the wavelength of the light used.
 - B) small compared to the wavelength of the light used.
 - C) microscopic.

- 4) A surface that is considered rough for infrared waves may be polished for
 - A) light waves.
 - B) radio waves.
 - C) both of these
 - D) none of these

- 5) The shortest plane mirror in which you can see your entire image is
 - A) about $\frac{1}{3}$ your height.
 - B) dependent on your distance from the mirror.
 - C) about $\frac{3}{4}$ your height.
 - D) half your height.
 - E) equal to your height.

- 6) Light travels fastest in
 - A) a vacuum.
 - B) cool air.
 - C) warm air.

- 7) Refraction results from differences in light's
- A) speed.
 - B) incident angles.
 - C) frequency.
 - D) all of these
 - E) none of these
- 8) Light refracts when traveling from air into glass because light
- A) has greater frequency in air than in glass.
 - B) has greater intensity in air than in glass.
 - C) travels slower in glass than in air.
 - D) has greater frequency in glass than in air.
 - E) has greater intensity in glass than in air.
- 9) The average speed of light is greatest in
- A) red glass.
 - B) orange glass.
 - C) blue glass.
 - D) green glass.
 - E) is the same in all of these
- 10) The critical angle for a transparent material is the angle at and beyond which all light within the material is
- A) reflected.
 - B) refracted.
 - C) dispersed.
 - D) absorbed.
 - E) diffused.
- 11) According to Huygens' principle, every point on a wave
- A) behaves as a source of new waves.
 - B) is a diffraction source.
 - C) is the superposition of every other part of the wave.
 - D) all of these
 - E) none of these
- 12) The glare seen from water is largely
- A) vertically polarized.
 - B) horizontally polarized.
 - C) unpolarized.

- 13) Interference colors in a soap bubble give evidence that the soap film
- A) is thin.
 - B) has two reflecting surfaces.
 - C) both of these
 - D) neither of these
- 14) Polarization is a property of
- A) transverse waves.
 - B) longitudinal waves.
 - C) both
 - D) neither
- 15) Monochromatic light is light of a single
- A) frequency.
 - B) color.
 - C) wavelength.
 - D) all of these
 - E) none of these
- 16) Light from a lit match comes from
- A) protons.
 - B) neutrons.
 - C) electrons.
 - D) all of these
- 17) Electrons with the greater potential energies with respect to the atomic nucleus are
- A) outer electrons.
 - B) inner electrons.
 - C) both the same, actually
- 18) An excited atom is an atom
- A) with more protons than electrons.
 - B) that has excess vibration.
 - C) that has one or more displaced electrons.
 - D) that is frantic.
- 19) Light is emitted when an electron
- A) is boosted to a higher energy level.
 - B) makes a transition to a lower energy level.
 - C) neither of these
- 20) An atom that absorbs a photon of a certain energy can then emit
- A) only a photon of the same or higher energy.
 - B) a photon of any energy.
 - C) only a photon of the same or lower energy.
 - D) only a photon of that energy.