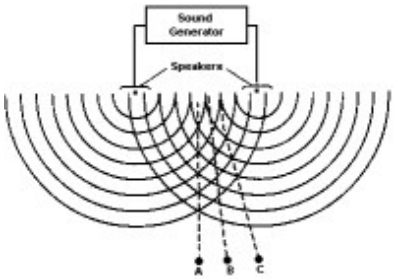
Name: _____

1. A single pulse in a uniform material medium transfers
   A. standing waves
   B. energy
   C. mass
   D. wavelength

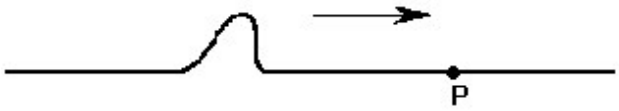
2. In the diagram, two speakers are connected to a sound generator. The speakers produce a sound pattern of constant frequency such that a listener will hear the sound very well at *A* and *C*, but not as well at point *B* .



Which wave phenomenon is illustrated by this experiment?

   A. interference
   B. polarization
   C. reflection
   D. refraction

3. The diagram shows a transverse pulse moving to the right in a string.



Which diagram below best represents the motion of point *P* as the pulse passes point *P*?

A. 

C. 

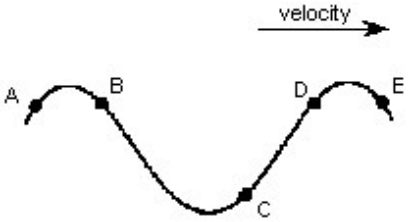
B.

D. 

4. Which term describes two points on a periodic wave that are moving in the same direction and have the same displacement from their equilibrium positions?
   A. dispersed
   B. refracted
   C. polarized
   D. in phase

5. As observed from the Earth, the light from a star is shifted toward lower frequencies. This is an indication that the distance between the Earth and the star is
   A. decreasing
   B. increasing
   C. constant

6. Which point on the wave diagram below is in phase with point *A*?



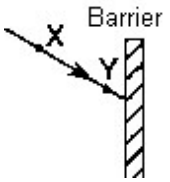
   A. *E*
   B. *B*
   C. *C*
   D. *D*

7. An opera singer's voice is able to break a thin crystal glass if the singer's voice and the glass have the same natural
   A. frequency
   B. speed
   C. amplitude
   D. wavelength

8. What is the wavelength of a 30.-Hertz periodic wave moving at 60. meters per second?

A. 0.50 m
B. 2.0 m
C. 20. m
D. 1800 m

9. The diagram below shows the direction of water waves moving along path *XY* toward a barrier.



Which arrow below represents the direction of the waves after they have reflected from the barrier?

A. 
C. 
B. 
D. 

10. Which phenomenon does *not* occur when a sound wave reaches the boundary between air and a steel block?

A. reflection
B. refraction
C. polarization
D. absorption

11. What is the period of a periodic wave that has a frequency of 60. hertz?

A. 1.7×10^{-2} s
B. 2.0×10^{4} s
C. 3.0×10^{-3} s
D. 3.3×10^{2} s

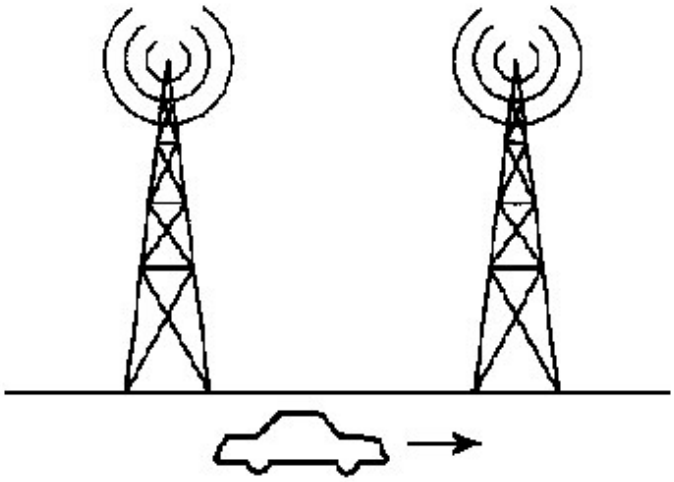
12. Two waves have the same frequency. Which wave characteristic must also be the same for both waves?

A. phase
B. amplitude
C. intensity
D. period

13. Light is to brightness as sound is to

A. color
B. loudness
C. period
D. speed

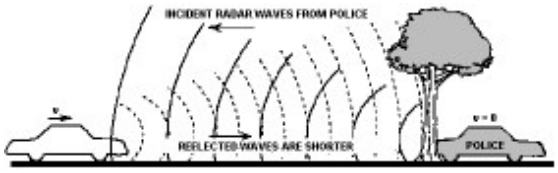
14. A car radio is tuned to the frequency being emitted from two transmitting towers. As the car moves at constant speed past the towers the sound from the radio repeatedly fades in and out.



This phenomenon can best be explained by

A. refraction
B. interference
C. reflection
D. resonance

15. The diagram shows radar waves being emitted from a stationary police car and reflected by a moving car back to the police car.



The difference in apparent frequency between the incident and reflected rays is an example of

A. constructive interference
B. refraction
C. the Doppler effect
D. total internal reflection

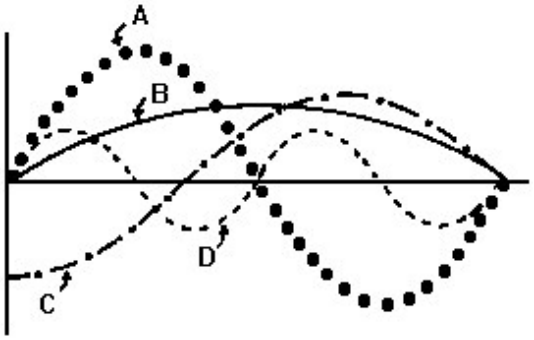
16. A police officer's stationary radar device indicates that the frequency of the radar wave reflected from an automobile is less than the frequency emitted by the radar device. This indicates that the automobile is

A. moving toward the police officer
B. moving away from the police officer
C. not moving

17. What is the frequency of a wave if its period is 0.25 seconds?

A. 1.0 Hz
B. 0.25 Hz
C. 12 Hz
D. 4.0 Hz

18. In the diagram, which wave has the largest amplitude?

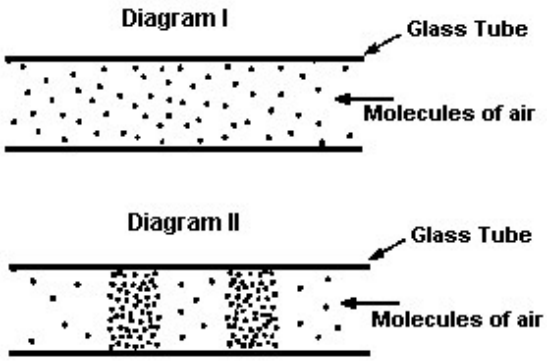


A. *A*
B. *B*
C. *C*
D. *D*

19. A typical microwave oven produces radiation at a frequency of 1.0×10^{10} hertz. What is the wavelength of this microwave radiation?

A. 3.0×10^{-1} m
B. 3.0×10^{-2} m
C. 3.0×10^{10} m
D. 3.0×10^{18} m

20. Diagram I shows a glass tube containing undisturbed air molecules. Diagram II shows the same glass tube after a wave passes through it.



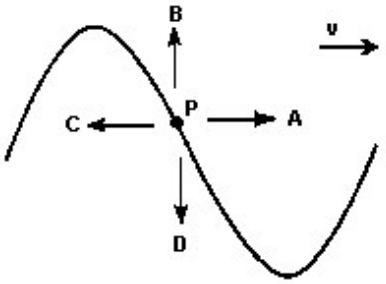
Which type of wave produced the disturbance in Diagram II?

A. longitudinal
B. torsional
C. transverse
D. elliptical

21. The spreading of waves into the region behind an obstacle is known as

A. diffusion
B. dispersion
C. refraction
D. diffraction

22. The diagram shows a transverse water wave moving in the direction shown by velocity vector v .



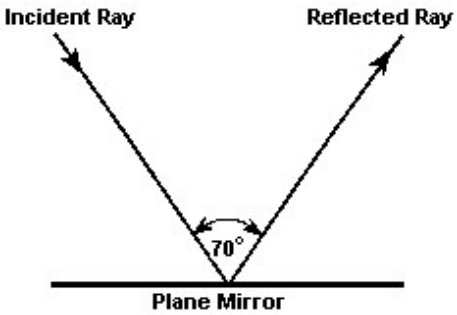
At the instant shown, a cork at point *P* on the water's surface is moving toward

A. *A*
B. *B*
C. *C*
D. *D*

23. To the nearest order of magnitude, how many times greater than the speed of sound is the speed of light?

A. 10^4
B. 10^6
C. 10^{10}
D. 10^{12}

24. The diagram represents a light ray being reflected from a plane mirror. The angle between the incident ray and the reflected ray is 70.°.



What is the angle of incidence for this ray?

A. 20.°
B. 35°
C. 55°
D. 70.°

25. As a periodic wave travels from one medium to another, which pair of the wave's characteristics cannot change?

A. period and frequency
B. period and amplitude
C. frequency and velocity
D. amplitude and wavelength