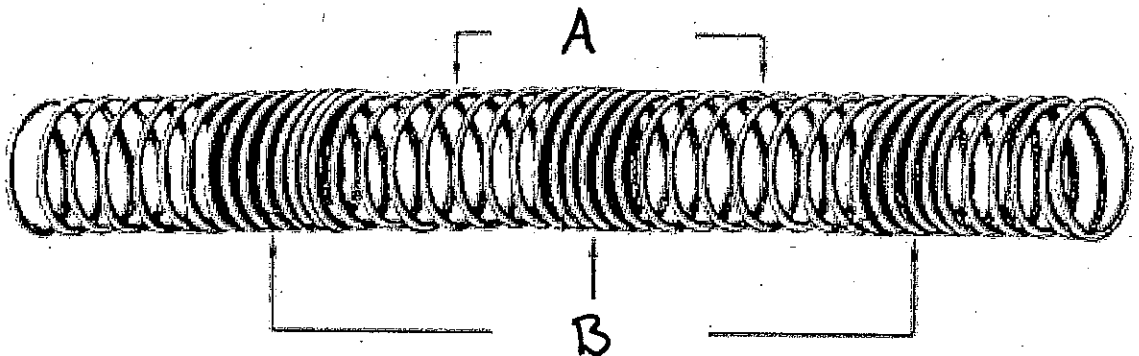


Ch 11 Test, Vibrations and Waves

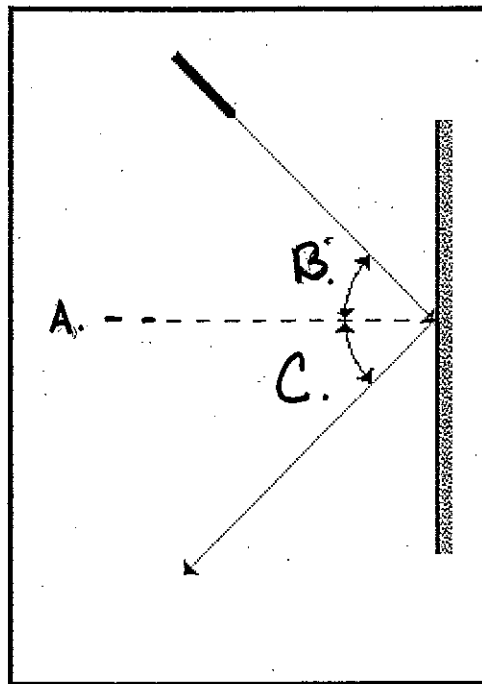
Please do not write on this test

1. \_\_\_\_\_ a type of wave that doesn't require a medium to transmit energy.
2. \_\_\_\_\_ is a force that pushes or pulls a mass back toward the equilibrium position.
3. \_\_\_\_\_ maximum distance from equilibrium position.
4. \_\_\_\_\_ time required to complete a full complete cycle or vibration.
5. \_\_\_\_\_ measures how "tight" a spring is.
6. \_\_\_\_\_ number of vibrations per second.
7. \_\_\_\_\_ is any motion that experiences a restoring force proportional to the displacement of the system.
8. \_\_\_\_\_ is a means for transmitting energy through a medium over a distance.
9. FM radio waves are broadcast in \_\_\_\_\_ ?
10. \_\_\_\_\_ occurs when 2 or more waves interact.
11. \_\_\_\_\_ is a law that describes the relationship between force and displacement.
12. \_\_\_\_\_ a type of wave that requires a medium to transmit energy.
13. \_\_\_\_\_ speed equals frequency times \_\_\_\_\_.

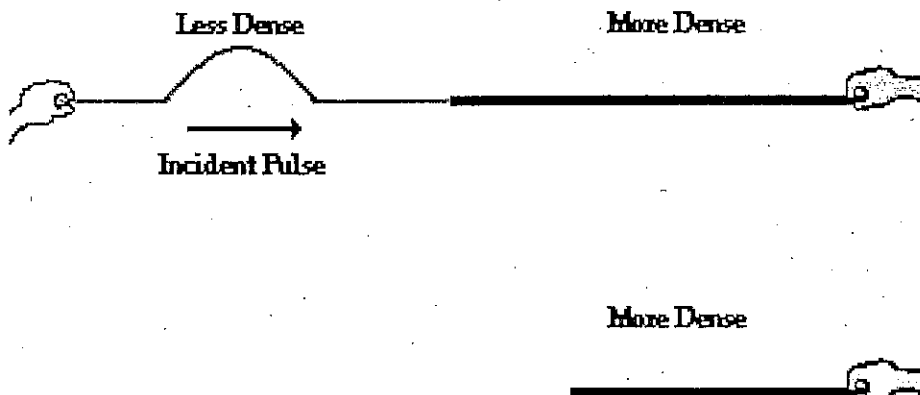


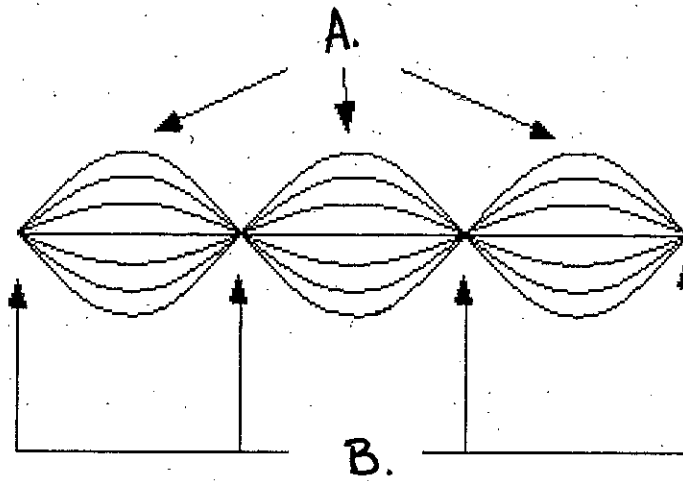
14. *Using above wave.*
  - a. Type of Wave? \_\_\_\_\_
  - b. What is location a called? \_\_\_\_\_
  - c. What is location B called? \_\_\_\_\_
  - d. The particles vibrate \_\_\_\_\_ to the direction of wave motion in this type of wave?

15. Draw an example, showing in a couple of steps, of total constructive interference
16. Draw an example, showing in a couple of steps, of destructive interference.



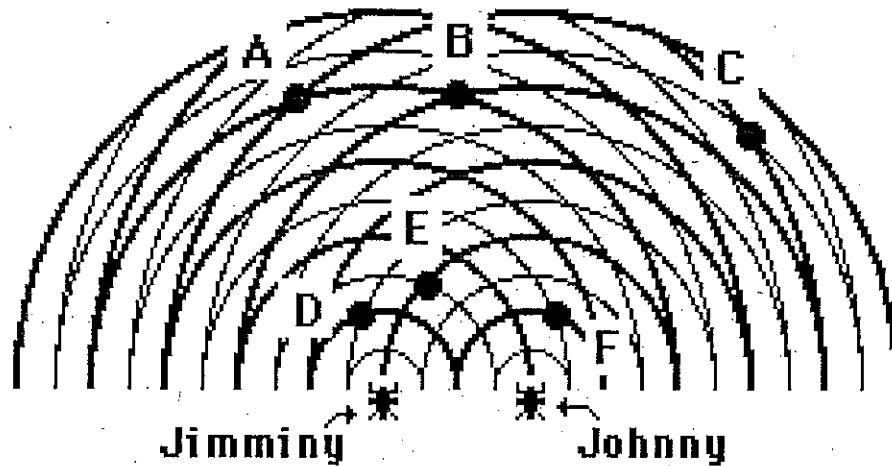
17. Name each of the locations from wave reflection diagram above
  - a.
  - b.
  - c.
18. Waves reflected by a fixed boundary are \_\_\_\_\_ and \_\_\_\_\_?
19. \_\_\_\_\_ occurs when an incident wave encounters a change in medium.
20. \_\_\_\_\_ the slight bending of a wave around an obstacle.
21. Draw the reflected pulse and transmitted pulse from a wave traveling from a less dense to a more dense medium (will be reflected off the boundary)



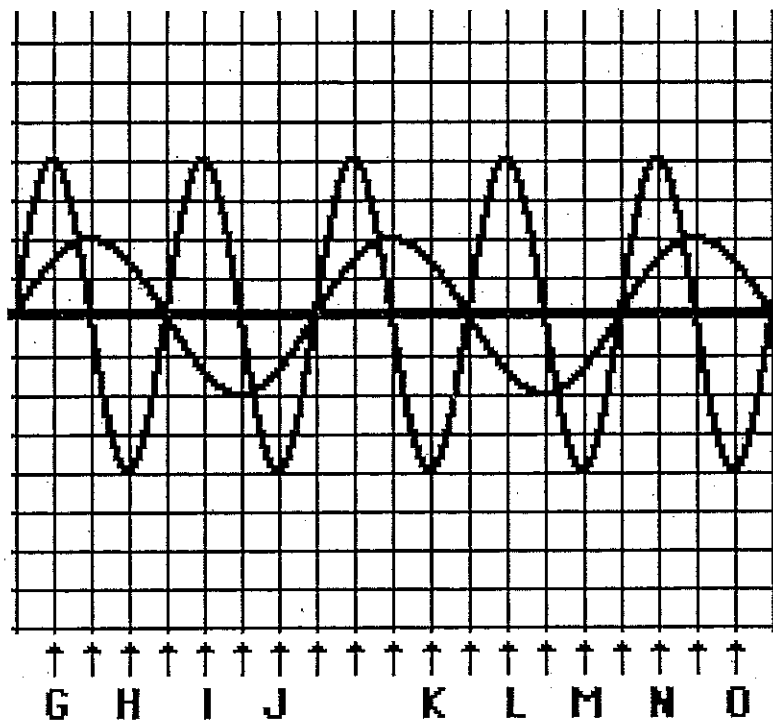


22. Name each of the points from the above diagram.
- a.
  - b.

23. The diagram in problem 22 is an example of this type of wave \_\_\_\_\_. It's a wave pattern that results when 2 waves of the same \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ travel in opposite directions and interfere.



24. Twin water bugs Jimminy and Johnny are both creating a series of circular waves by jiggling their legs in the water. The waves undergo interference and create the pattern represented in the diagram at the right. The thick lines in the diagram represent wave crests and the thin lines represent wave troughs. Several of positions in the water are labeled with a letter. Categorize each labeled position as being a position where either constructive or destructive interference occurs.
- a. Constructive Interference:
  - b. Destructive Interference:



25. Several positions along the medium are labeled with a letter. Categorize each labeled position along the medium as being a position where either constructive or destructive interference occurs.
- Constructive Interference:
  - Destructive Interference:
26. A simple pendulum swings in simple harmonic motion. At maximum displacement,
- The acceleration reaches a maximum
  - The velocity reaches a maximum
  - The acceleration reaches zero
  - The restoring forces reaches zero
27. The large meteorite of lunar origin has a mass of 17 g. If the meteorite is placed on a scale whose spring constant is 81.5 N/m, what is the compression of the spring?
28. If you have a  $4.25 \times 10^3$  m elastic cord with a spring constant of  $3.40 \times 10^2$  N/m, what force would stretch the spring to  $1.25 \times 10^4$  m?
29. A hummingbird makes a humming sound with its wings, which beat with a frequency of 92.0 Hz. Suppose a mass is attached to a spring with a spring constant of  $2.55 \times 10^2$  N/m. How large is the mass if its oscillations frequency is  $3.21 \times 10^2$  times that of a hummingbird's wings?
30. An object produces a sound that has a frequency of 125 Hz. What is the wavelength of this sound in air? The speed of sound in air is 334 m/s.