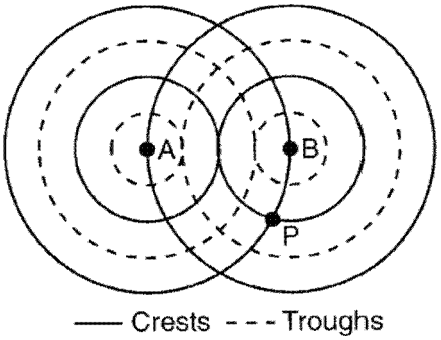
Practice - Surface Waves

Name: _____ **Date:** _____

1. The accompanying diagram shows two sources, *A* and *B*, vibrating in phase in the same uniform medium and producing circular wave fronts.



Which phenomenon occurs at point *P*?

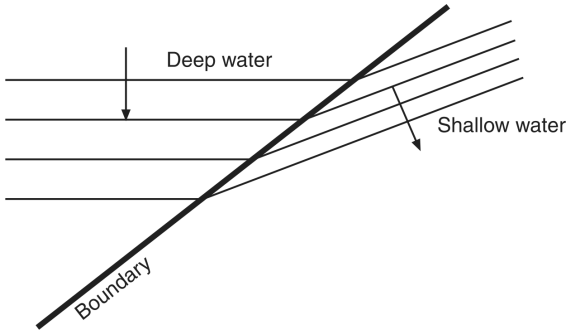
A. destructive interference

B. constructive interference

C. reflection

D. refraction

2. The diagram below represents straight wave fronts passing from deep water into shallow water, with a change in speed and direction.

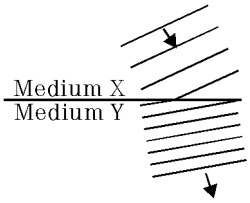


Which phenomenon is illustrated in the diagram?

A. reflection B. refraction

C. diffraction D. interference

3. The diagram represents wave fronts traveling from medium *X* into medium *Y*. All points on any one wave front shown must be



A. traveling with the same speed

B. traveling in the same medium

C. in phase

D. superposed

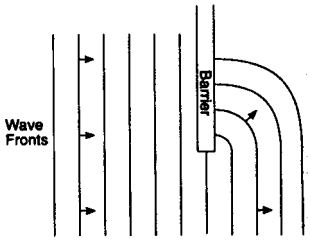
4. The diagram shows a wave phenomenon. The pattern of waves shown behind the barrier is the result of

A. reflection

B. refraction

C. diffraction

D. interference



5. Waves pass through a 10.-centimeter opening in a barrier without being diffracted. This observation provides evidence that the wavelength of the waves is

A. much shorter than 10. cm

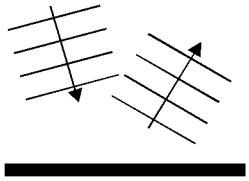
B. equal to 10. cm

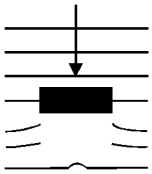
C. longer than 10. cm, but shorter than 20. cm

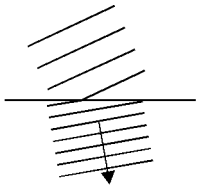
D. longer than 20. cm

6. Which diagram best illustrates wave refraction?

A. 

B. 

C. 

D. 

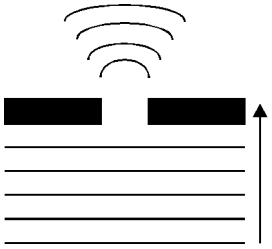
7. Which wave phenomenon is represented in the diagram here?

A. refraction

B. diffraction

C. reflection

D. interference



8. Parallel wave fronts incident on an opening in a barrier are diffracted. For which combination of wavelength and size of opening will diffraction effects be greatest?

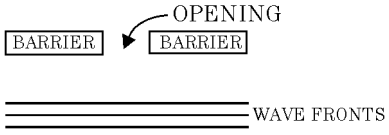
A. short wavelength and narrow opening

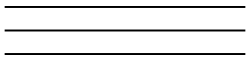
B. short wavelength and wide opening

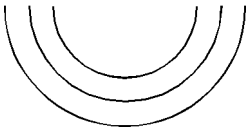
C. long wavelength and narrow opening

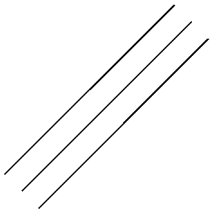
D. long wavelength and wide opening

9. The diagram shown represents straight wave fronts approaching an opening in a barrier. Which diagram best represents the shape of the waves after passing through the opening?



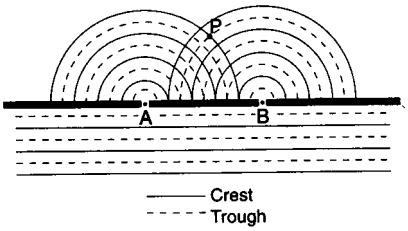
A. 

B. 

C. 

D. 

10. The diagram represents shallow water waves of wavelength λ passing through two small openings, *A* and *B*, in a barrier. Compared to the length of the path *BP*, the length of path *AP* is



A. 1λ longer

B. 2λ longer

C. $\frac{1}{2}\lambda$ longer

D. the same

11. The diagram given shows straight wave fronts passing through an opening in a barrier.

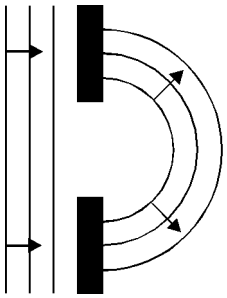
This wave phenomenon is called

A. reflection

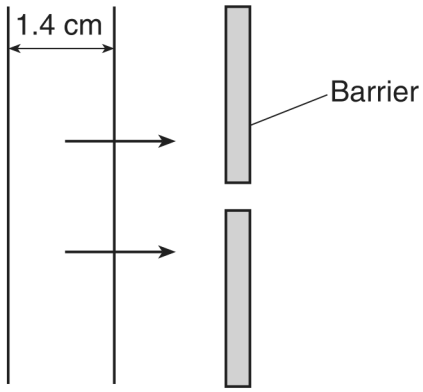
B. refraction

C. polarization

D. diffraction

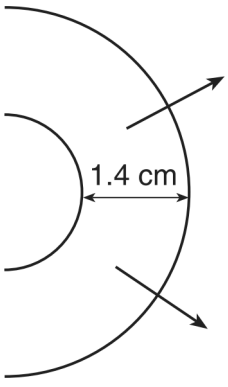


12. The diagram below shows a series of straight wave fronts produced in a shallow tank of water approaching a small opening in a barrier.

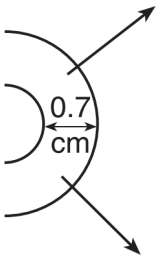


Which diagram represents the appearance of the wave fronts after passing through the opening in the barrier?

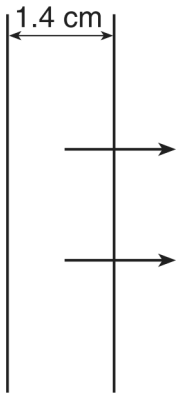
A.



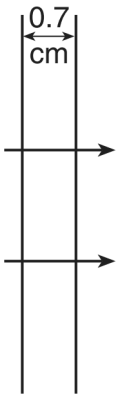
B.



C.



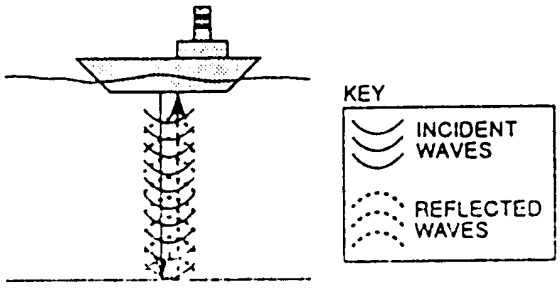
D.



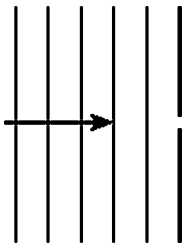
13. The sonar of a stationary ship sends a signal with a frequency of 5.0×10^3 hertz down through water. The speed of the signal is 1.5×10^3 meters per second. The echo from the bottom is detected 4.0 seconds later.

a) What is the wavelength of the sonar wave? [Show all calculations, including the equation and substitution with units.]

b) What is the depth of the water under the ship? [Show all calculations, including the equation and substitution with units.]

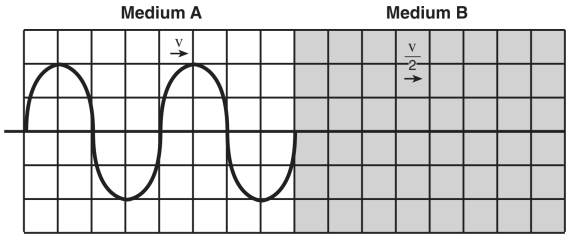


14. The accompanying diagram shows a plane wave passing through a small opening in a barrier.



On the diagram above, sketch four wave fronts after they have passed through the barrier.

15. A periodic wave travels at speed v through medium A. The wave passes with all its energy into medium B. The speed of the wave through medium B is $\frac{v}{2}$. On the diagram below, draw the wave as it travels through medium B. [Show at least one full wave.]



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1.
Answer: B

2.
Answer: B

3.
Answer: C

4.
Answer: C

5.
Answer: A

6.
Answer: D

7.
Answer: B

8.
Answer: C

9.
Answer: D

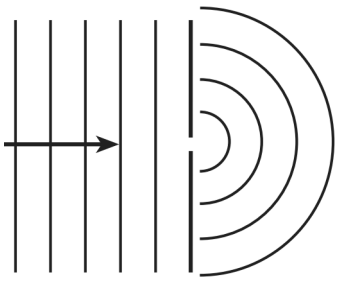
10.
Answer: C

11.
Answer: D

12.
Answer: A

13.
Answer:

14.
Answer:



15.
Answer: