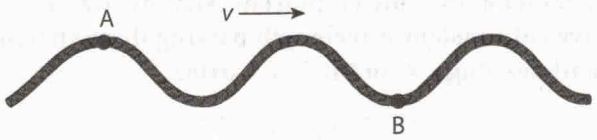
Directions

Review the Test-Taking Strategies section of this book. Then answer the following questions. Read each question carefully and answer with a correct choice or response.

Part A

1 A periodic wave travels through a rope, as shown in the diagram below.

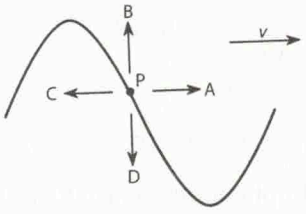


As the wave travels, what is transferred between points A and B?
(1) mass only
(2) energy only
(3) both mass and energy
(4) neither mass nor energy

2 In which wave type is the disturbance parallel to the direction of wave travel?
(1) torsional (3) transverse
(2) longitudinal (4) circular

3 A tuning fork oscillates with a frequency of 256 hertz after being struck by a rubber hammer. Which phrase best describes the sound waves produced by this oscillating tuning fork?
(1) electromagetic waves that require no medium for transmission
(2) electromagnetic waves that require a medium for transmission
(3) mechanical waves that require no medium for transmission
(4) mechanical waves that require a medium for transmission

4 The diagram below 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
(1) A (2) B (3) C (4) D

5 The energy of a sound wave is most closely related to its
(1) period (3) frequency
(2) amplitude (4) wavelength

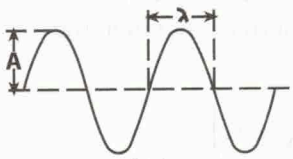
6 The product of a wave's frequency and its period is
(1) one (3) its wavelength
(2) its velocity (4) Planck's constant

7 What is the period of a wave with a frequency of 250 hertz?
(1) 1.2×10^{-3} s
(2) 2.5×10^{-3} s
(3) 9.0×10^{-3} s
(4) 4.0×10^{-3} s

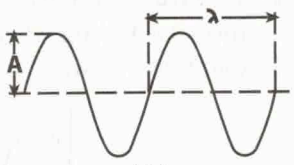
8 The reciprocal of the frequency of a periodic wave is the wave's
(1) period (3) intensity
(2) amplitude (4) speed

9 Two points on a transverse wave that have the same magnitude of displacement from equilibrium are in phase if the points also have
(1) the same direction of displacement and the same direction of motion
(2) the same direction of displacement and the opposite direction of motion
(3) the opposite direction of displacement and the same direction of motion
(4) the opposite direction of displacement and the opposite direction of motion

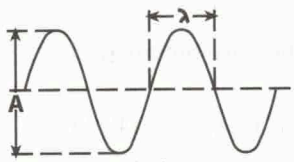
10 Which wave diagram has *both* wavelength (λ) and amplitude (A) labeled correctly?



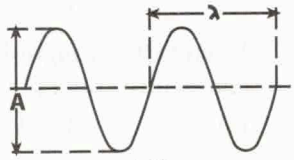
(1)



(3)

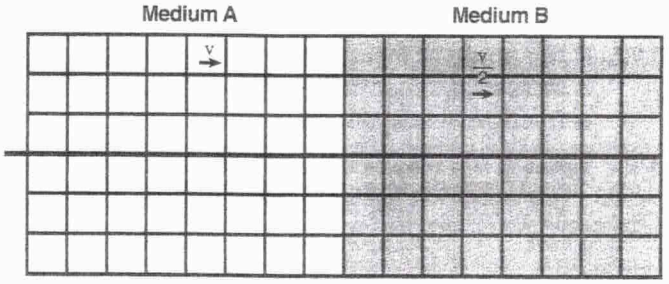


(2)



(4)

121. 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.]



Base your answers to questions 125 through 127 on the information below.

A beam of monochromatic light having a wavelength of 5.89×10^{-7} meters in air is incident on the surface of a diamond at an angle of 0°.

125. Calculate the wavelength of this light in the diamond.

126. Determine the angle of refraction of this light as it enters the diamond.

127. Compare the frequency and speed of this light in the diamond to the frequency and speed of this light in air.