Vibrations and Waves

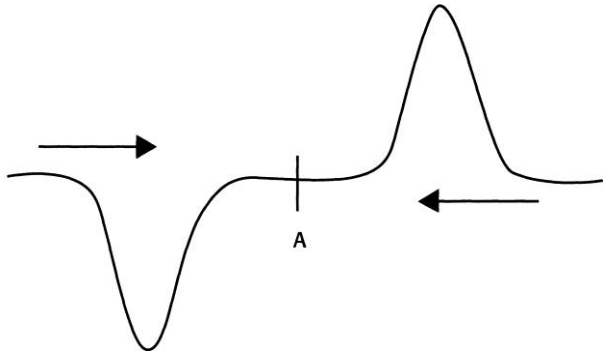
Section Quiz 3: Wave Interactions

Write the letter of the correct answer in the space provided

_____ 1. When two transverse waves traveling through a medium meet and exactly coincide, the resulting displacement of the medium
   a. is the sum of the displacements of each wave.
   b. is zero.
   c. is always greater than the displacement of either wave alone.
   d. is always destructive.

_____ 2. When two waves having displacements in opposite directions meet, _____ occurs.
   a. complete cancellation
   b. no interference
   c. constructive interference
   d. destructive interference

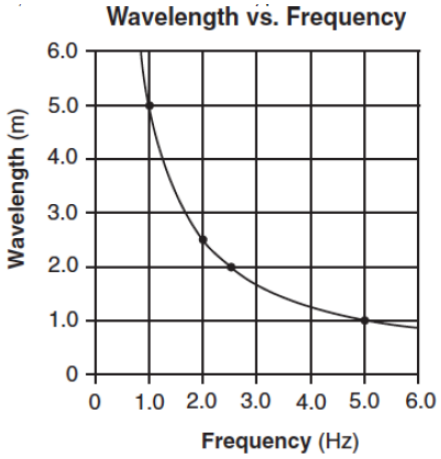
_____ 3. Two waves meet and interfere constructively. Which one of the following factors increases?
   a. period
   b. frequency
   c. amplitude
   d. wavelength



_____ 4. The diagram above represents two pulse waves moving toward each other through a medium. The two waves will exactly coincide when they reach point A. At point A, the amplitude of the combined waves will be
   a. twice that of either wave alone.
   b. the same as either wave alone.
   c. half that of either wave alone.
   d. zero.

_____ 5. When a wave on a rope strikes a soft boundary, the wave is
   a. reflected and inverted.
   b. reflected but not inverted.
   c. not reflected.
   d. absorbed.

_____ 6. The principle of superposition states that _____.
a. waves from different mediums can combine to form a new wave
b. the energy of a wave depends on its position
c. waves can never combine
d. two or more waves can combine to form a new wave



_____ 7. The graph above represents the relationship between wavelength and frequency of wave created by two students shaking the ends of a loose spring. Calculate the speed of the waves generated in the spring
a. 1 m/s
b. 2 m/s
c. 5 m/s
d. 10 m/s

_____ 8. Two successive crests of a transverse wave are 1.20 m apart. Eight crests pass a given point every 12.0 s. What is the wave speed?
a. 0.667 m/s
b. 0.800 m/s
c. 1.80 m/s
d. 9.60 m/s

9. Two waves traveling in the same medium are approaching each other. What determines whether constructive or destructive interference occurs when the waves meet and coincide?

10. What is the wavelength of a radio wave from an FM station that broadcasts at a frequency of 95.5 MHz? The speed of electromagnetic waves in space is 3.00×10^8 m/s. ($M = 10^6$)