Quiz 5

1. A wave travels at 175 m/s along the x-axis. If the period of the periodic vibrations of the wave is 3.0 milliseconds, then what is the wavelength of the wave?
   A) 25.5 cm  
   B) 35.6 cm  
   C) 42.9 cm  
   D) 49.5 cm  
   E) 52.5 cm  
   Ans: E

2. The wavelength of a periodic wave is 0.75 m. If the frequency is 425 Hz, then what is the velocity of the wave?
   A) 210 m/s  
   B) 276 m/s  
   C) 319 m/s  
   D) 410 m/s  
   E) 472 m/s  
   Ans: 

3) An ambulance is generating a siren sound at a frequency of 2,000 Hz. The velocity of sound is 345 m/s. The observer and the ambulance are traveling toward each other at a velocity of 24.0 m/s. If the observer is stationary, what is the frequency of the siren perceived by the observer?
   a) 2,032 Hz  
   b) 2,150 Hz  
   c) 2,220 Hz  
   d) 2,575 Hz  
   e) 2,750 Hz  
   Ans: b

4) An ambulance is generating a siren sound at a frequency of 2,400 Hz. The velocity of sound is 345 m/s. If the observer is traveling at a velocity of 24.0 m/s toward the stationary ambulance, then what is the frequency of the siren perceived by the observer?
   a) 2,640 Hz  
   b) 2,567 Hz  
   c) 2,520 Hz  
   d) 2,508 Hz  
   e) 2,475 Hz  
   Ans: b

5) A sound wave radiates from a source in all directions. If the power of the sound source is 200 watts, then the intensity level of the sound wave 1000 m from the source is, in dB
   a) 62.8  
   b) 66.0  
   c) 68.5  
   d) 70.5  
   e) 72.0  
   Ans: e

6) The speed of sound in helium is 965 m/s. If the density of helium is 0.179 kg/ m³, then what is the bulk modulus of helium,
a) $2.70 \times 10^5 \text{ N/m}^2$

b) $2.40 \times 10^5 \text{ N/m}^2$

c) $2.20 \times 10^5 \text{ N/m}^2$

d) $1.70 \times 10^5 \text{ N/m}^2$

e) $1.56 \times 10^5 \text{ N/m}^2$

Ans: d

7) The speed of sound in air at $0^\circ \text{C}$ is 331 m/s. What is the velocity of sound in air at a temperature of $-30^\circ \text{C}$?

a) 308 m/s

b) 310 m/s

c) 312 m/s

d) 314 m/s

e) 316 m/s

Ans: c