Quiz 3: Intensity and Resonance

1. Suppose the speakers in a stereo sound system produce sound waves with a power of 0.55 W. What is the intensity of the sound waves at the position of a listener located 2.5 m from the speakers?

- A. 2.8×10^{-3} W/m^2
- B. 7.0×10^{-3} W/m^2
- C. 8.9×10^{-2} W/m^2
- D. 2.2×10^{-1} W/m^2

2. Some municipalities have laws prohibiting excessively loud car stereos. If the maximum sound intensity allowed at 15 m from the car is 1.0×10^{-4} W/m^2 (70 dB), what is the maximum allowed power output from the speakers in the car stereo?

- A. 28 W
- B. 0.28 W
- C. 0.022 W
- D. 0.019 W

3. Which of the following statements about the sensitivity of the human ear to sound is true?

- A. The human ear perceives the sound intensity of all frequencies equally well.
- B. The human ear is most sensitive to sound intensity at low frequencies.
- C. The human ear is least sensitive to sound intensity at moderate frequencies.
- D. The human ear is least sensitive to sound intensity at very low and very high frequencies.

4. The unit used to measure the loudness or relative intensity of a sound is

- A. volume.
- B. hertz.
- C. the decibel.
- D. the watt.

5. A sound that is 10 dB louder than another sound is perceived as _____ as loud as the softer sound, but it has an intensity that is _____ the softer sound.

- A. 10 times, 10 times greater than
- B. 10 times, twice as great as
- C. twice, 10 times greater than
- D. twice, twice as great as

6. Sounds from vibrating strings such as those of a guitar or harp are made loud enough for many to hear by the process of

- A. resonance.
- B. harmonics.
- C. infrasound.
- D. decibels.

7. Resonance occurs when the vibrations of one object cause another object to vibrate at the same rate. Which of the following choices is least likely to be significant when resonance occurs between two objects?

- A. frequency
- B. amplitude
- C. wavelength
- D. speed of sound waves

8. When the music from the stereo in your room plays at a certain pitch, you can hear a "buzzing" sound that is not coming from the stereo itself. This "buzzing" sound is the result of

- A. resonance.
- B. diffraction.
- C. interference.
- D. reflection.