**Simple Harmonic Motion & Mechanical Waves Conceptual Answers**

1. It has a consistent period of oscillation
2. The time for one complete oscillation (to and fro)
3. The oscillator is at rest momentarily when amplitude is a maximum, and moves at maximum velocity as it passes through the equilibrium position
4. Acceleration is a maximum when amplitude is a maximum, and the acceleration is zero at the equilibrium position
5. Restoring force is a maximum when amplitude is a maximum, and the restoring force is zero at the equilibrium position
6. Potential energy is being converted into kinetic energy, and vice versa
7. Amplitude is the distance from the equilibrium position to the peak or crest; wavelength is the distance one wave takes; frequency is the number of waves that pass a given point in a given time period; period is the time it takes for one wave to pass a given point
8. They are the inverses of one another
9. Energy
10. No, energy travels through the medium
11. Wave speed = wavelength x frequency
12. Perpendicular
13. Parallel
14. Compressions compare to crests; rarefactions compare to troughs
15. Constructive interference creates a larger amplitude, while destructive interference creates a smaller amplitude
16. An incident wave and a reflected wave that have the same frequencies lead to a standing wave; constructive and destructive interference patterns
17. A node is where there is no vibrations, and an antinode is where there is maximum vibrations
18. The emitted frequency does not change, but the observed frequency changes. The emitted wavelength does not change, but the observed wavelength will change. The wave speed does not change.
19. In ALL waves!