Physics Chapter 11-12 Test Review

MC 1. A repeated motion, such as that of an acrobat swinging on a trapeze, is called a Periodic Motion

MC 2. Any periodic motion that is the result of a restoring force that is proportional to the displacement is called Simple harmonic Motion

MC 3. The maximum distance from the equilibrium position in a simple harmonic motion is called what? Amplitude

FIB 4. What does the period of a simple pendulum depend on? Length

FIB 5. What 2 things does the period of a mass-spring system depend on? Mass and gravity

6. How much force would be required to pull a slingshot if it can stretch 72.5 m and it has a spring constant of 6723 N/m? **Spring force = -(spring constant x displacement)**

$F = -(6723 \cdot 72.5) =$ _____ N

7. If the period of a pendulum is 212 seconds, how tall would the pendulum be? **Period = $2\pi\sqrt{L/g}$**

$212 = (2\pi)\sqrt{\frac{L}{9.8}}$

8. If a spring with a mass of .98 kg is attached vertically stretches to 22.31 m, what is the spring constant? **mass x gravity = -spring constant x displacement**

$.98 \cdot -9.8 = -SC \cdot 22.31$

9. A mass of .98 kg is attached to a spring and is set into vibration with a period of 267 seconds. What is the spring constant of the spring? **Period = $2\pi\sqrt{m/k}$**

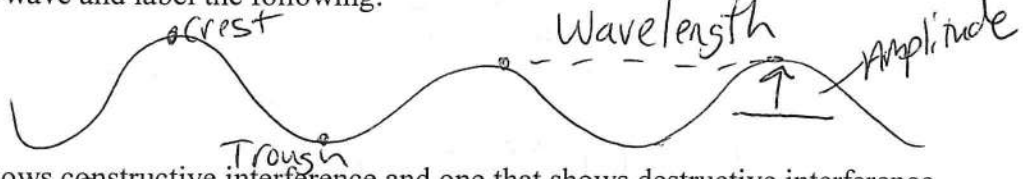
$267 = (2\pi)\sqrt{\frac{.98}{K}}$

10. A tuning fork produces a sound with a frequency of 2556 Hz and wavelength in air of 635 m. What value does this give for the speed of sound in air? **Speed = frequency x wavelength**

$S = 2556 \cdot 635 =$ _____ $\frac{m}{s}$

11. Draw a Transverse sine wave and label the following:
    a. Crest
    b. Trough
    c. Wavelength
    d. Amplitude

FIB



12. Draw 2 waves, 1 that shows constructive interference and one that shows destructive interference.

FIB

FIB 13. Draw a standing wave. Label the node and antinode.

MC 14. What is the lowest possible frequency of a standing wave called? fundamental

MC 15. What is a series of frequencies of a standing wave called? harmonic series

MC 16. When two waves interfere with each other, there are slightly different frequencies present that cause the listener to perceive a variation of loudness. What is this called? Beat

MC 17. A whistle is blown and a person cannot hear the sound. After analyzing the sound, it is determined that the person cannot hear it because it has too low of a frequency. What type of wave was created? infrasonic

MC 18. Another whistle is blown and the person can't hear the sound. After analyzing the sound, it is determined that the person can't hear it because it has too high of a frequency. What wave was created? Ultrasonic

MC 19. Several tuning forks are set into vibration. The students are then asked to rate each tuning fork on how high or low they perceive the sound to be. What is it they being asked to record?

Pitch

MC 20. A frequency shift that is the result of motion between the source of waves and the person is called what?

Doppler effect

MC 21. As the sound waves travel outward from a source, energy is transferred. The rate at which the energy is transferred is called what?

Intensity

MC 22. At 120 dB, your hearing is damaged. What is this called?

threshold of pain

MC 23. 0dB is the softest sound heard by a human. What is this called?

threshold of hearing

MC 24. While playing a guitar, the musician holds the strings so that the vibration cannot travel into the body of the guitar. He strums the string without holding it and the sound is greatly intensified What is this?

forced Vibrations

MC 25. The vibrations that are sent through a guitar which then cause the bridge of the guitar to vibrate are called what?

Sympathetic Vibrations

FIB 26. What is resonance and give 2 real world examples of resonance?

Match Vibrations wineglass, bridge

FIB 27. What does the speed of sound depend on?

temperature and medium/material

FIB 28. What are 3 uses of ultrasonic waves?

Ultrasound, echolocation, Radar

FIB 29. What is sound?

Vibration

FIB 30. A power output of a light bulb is 2600 W. At what distance is the light intensity of the light bulb .0012 W/m^2? **Intensity = Power / $4\pi r^2$**

$.0012 = \frac{2600}{4\pi r^2}$

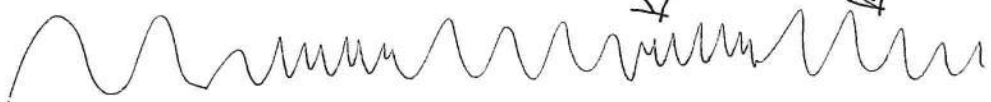
31. What is the fundamental frequency of a 2300 m long organ pipe that is closed at one end, when the speed of sound in the pipe is 560 m/s? **f = n (v/4L)**

$f = 1\left(\frac{560}{(4)(2300)}\right)$

32. A flute is open at both ends. The flute is 2.45 m long. What are the first 2 harmonics of a flute when all keys are closed, making the vibrating air column equal to the length of the flute? The speed of sound in the flute is 360 m/s. **f = n(v/2L)**

$f = 2\cdot\left(\frac{360}{(2)(2.45)}\right)$

FIB 33. Draw a longitudinal wave and label the compression and rarefaction.



MC 34. Which of the following is the distance in grid units from equilibrium to a crest or a trough?

- ○ Period of the wave
- ○ Peak to peak height
- ● Amplitude
- ○ Wavelength