

## Physics 221 – Spring 2013

### Quiz #1

Name: \_\_\_\_\_

- 1) What makes sound?
  - a) Something vibrating
  - b) Sound Waves
  - c) Two objects moving in the same direction
  - d) Two objects moving towards one another
  
- 2) When you talk, sound travels through the air as
  - a) moisture from your mouth to the listener's ear
  - b) air currents from your mouth to the listener's ear
  - c) dust particles from your mouth to the listener's ear
  - d) waves moving through the air from your mouth to the listener's ear
  - e) as particles from your mouth to the listener's ear
  
- 3) The energy of sound waves is always very small and can only be detected by our ears or other sensitive instruments.
  - a) True
  - b) False
  
- 4) Which of the following is NOT a cause of vibration for musical instruments
  - a) plucking a string
  - b) buzzing your lips
  - c) pressing a key on a flute
  - d) sliding a bow on a violin
  
- 5) When an object is made to vibrate at its natural frequency of vibration we say the object is
  - a) in resonance
  - b) in pitch
  - c) in harmony
  - d) in the cochlea
  - e) wavelength
  
- 6) Why does a tuba have lower sounds than a trumpet?
  - a) The large bell the sound comes out of
  - b) The fat tubes the sound waves move through before coming out
  - c) The long distance the sound waves have to travel before they get out
  - d) The way the musician blows into the tuba
  
- 7) A violin is basically a hollow wooden box with strings across it. If the wooden box were replaced by a solid piece of wood the violin would sound
  - a) the same
  - b) higher
  - c) lower
  - d) louder
  - e) quieter.

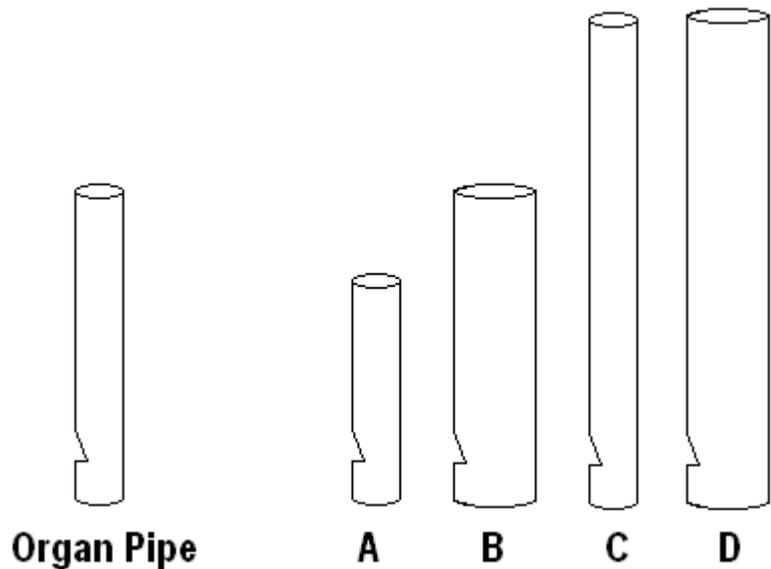


8) The organ pipe shown in the diagram produces a certain musical pitch. Which of the other four organ pipes shown would produce the same pitch?

- a) A
- b) B
- c) C
- d) D

9) If a person blows over the top of the pipes shown in the diagram, which pipe will make a lower (pitch) sound?

- a) A
- b) B
- c) C
- d) D
- e) Both C & D
- f) Both B & D
- g) Both A & C



10) Low pitch is

- a) a quiet sound
- b) a low sound (bass)
- c) a loud sound
- d) a high sound (treble)

11) The pitch of sound depends on the

- a) frequency of the sound
- b) loudness of the sound
- c) speed of the sound

12) Treble notes are high on the musical scale. The vibrations producing treble notes have

- a) low frequencies (vibrate at a low rate)
- b) high frequencies (vibrate at a high rate)
- c) The note does not depend on the rate of the vibrations (# per second)

13) Humans can hear sound with wavelengths that range from half an inch and to 50 feet. Bass notes are low on the musical scale and have

- a) longer wavelengths
- b) shorter wavelengths
- c) The note does not depend on the length of the wave

14) What part of the ear is used to collect and funnel sound down the ear canal?

- a) Eardrum
- b) Pinna
- c) Cochlea
- d) Ossicles

15) Hair cells in different parts of the cochlea respond to different frequencies.

Strongly agree	Agree	Don't know	Disagree	Strongly disagree
<input type="checkbox"/>				

16) Sound waves hit the eardrum and cause it to vibrate.

Strongly agree	Agree	Don't know	Disagree	Strongly disagree
<input type="checkbox"/>				

17) The vibrations continue through the ossicles in the middle ear and travel to the cochlea.

Strongly agree	Agree	Don't know	Disagree	Strongly disagree
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18) Sound that is too loud can damage the tiny hair cells of the inner ear.

Strongly agree	Agree	Don't know	Disagree	Strongly disagree
<input type="checkbox"/>				

19) The hair cells turn the vibrations into electrical signals that are sent to the brain.

Strongly agree	Agree	Don't know	Disagree	Strongly disagree
<input type="checkbox"/>				

20) Being around loud sounds a lot will help your ears get used to it and protect your hearing.

Strongly agree	Agree	Don't know	Disagree	Strongly disagree
<input type="checkbox"/>				

21) The more time I spend around loud sound, the worse my hearing will be.

Strongly agree	Agree	Don't know	Disagree	Strongly disagree
<input type="checkbox"/>				

22) Hair cells in the cochlea can be fixed after being damaged by loud sounds.

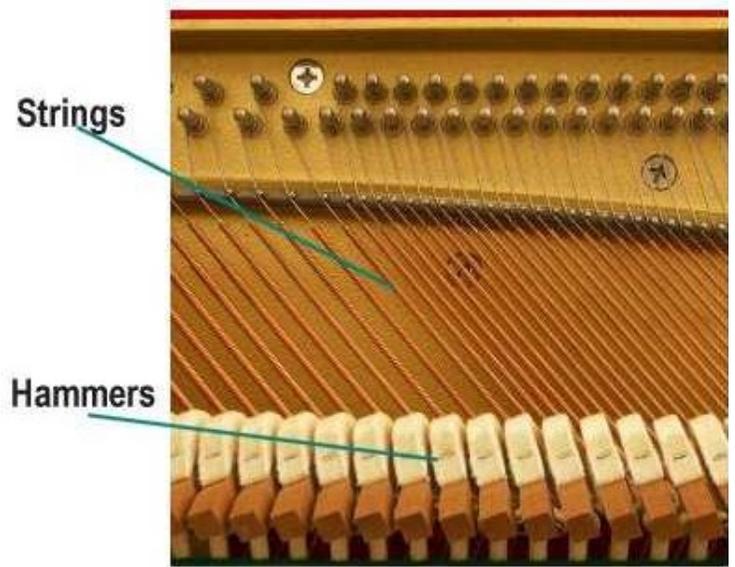
Strongly agree	Agree	Don't know	Disagree	Strongly disagree
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23) Clearly explain the difference between resonance and sympathetic vibration.

24) Consider a piano. The strings are shown to the right and are attached to the sound board. All of this is enclosed in the wooden piano body. Identify:

a) The source of sound

b) The way pitch is changed

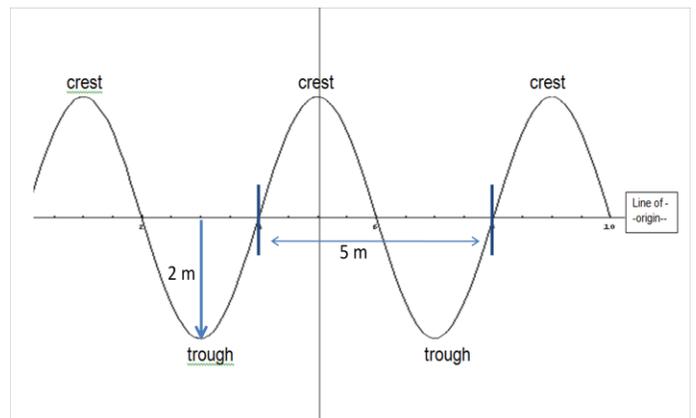


c) What amplifies the sound. Be specific about the *part* and with *what mechanism*.



25) The sinusoidal wave shown is traveling in the positive x-direction and has a frequency of 66 Hz. Find the

- a) Amplitude
- b) Wavelength
- c) Period
- d) Frequency



$$f = 1/T$$