

Name:

Date:

Unit D Test: Waves

K/U /16	T/I /8	A /12	C /6

- 1) Draw the fundamental frequency of a string which is stretched between two rigid ends. Then, draw the second and third harmonic overtones for the same string. [4K]

- 2) What do waves transport? [1K]

- 3) A longitudinal wave consists of _____ and _____. [2K]

- 4) When using the decibel scale, every 3-DB increase in sound intensity level is a _____ in intensity. A 10-DB increase increases the intensity by _____ times. [2K]

5) What is the wavelength of a wave vibrating with the fundamental frequency in a string that is stretched between two fixed points, 2.50 m apart? [2K]

6) What is the speed of sound in air, at $-20.0\text{ }^{\circ}\text{C}$? [1K]

7) Rank these materials in which sound may travel from fastest to slowest: [4K]

- a) Aluminum
- b) water
- c) steel
- d) Air

8)

- a) What is the period of a wave that has a frequency of 55 Hz? [2A]
- b) What is the frequency of a wave that has a period of 5.0 s? [2A]

9) If one singing bird produces a sound intensity level of 75 decibels, what sound intensity level will two singing birds produce? [2A]

10) A tuning fork with a frequency of 256 Hz is held above a closed air column while the column is gradually increased in length. At what lengths for this air column would the first four resonant points be found, if the speed of sound is 330 m/s? [6A]

11) An airplane is approaching at a speed of 360 km/h. If you measure the pitch of its approaching engines to be 512 Hz, what must be the actual frequency of the sound of the engines? The speed of sound in air is 345 m/s. [4T]

12) A police car siren has a frequency of 850 Hz. If you hear this siren to have a frequency that is 40.0 Hz greater than its true frequency, what is the speed of the car? [4T]

13) In your own words, explain what a shock wave is, and give an example of when one may occur. [3C]

14) Explain, in your own words, why sound tends to travel at faster speeds in cold air as compared to warmer air. [3C]