1. What is the frequency of a tuning fork that resonates with an open tube 25.0 centimeters long and 2.0 centimeters in diameter

    when the temperature is 20 degrees Celsius? (Answer 645.7 Hz)

2. A tuning fork, frequency 384 hertz, produces resonance with a closed tube 20.0 centimeters long and 4.0 centimeters in diameter. What is the speed of sound?   (Answer 331.8 m/s)

3. A tuning fork has a frequency of 440 hertz. If another fork of slightly lower pitch is sounded at the same time, the beats produce are 5 per second. What is the frequency of the second tuning fork?   (Answer 435 Hz)

4. How many beats will be heard each second when a string. frequency 288 hertz, is plucked simultaneously with another string, frequency 296 hertz?   (Answer 8 Hz)

5. If the string on a violin is 25.4 centimeters long and produces a fundamental tone of frequency 440 hertz, by how much must it be shortened to produce a tone of frequency 523.3 hertz?   (Answer 21.4 cm)

6. Compare the frequency of one string 25 centimeters long and .5 millimeters in diameter with that of another 100 centimeters long and .25 millimeters in diameter, assuming all other factors are constant.   (Answer f = 2 f ')

7. Two tuning forks of 320 hertz and 324 hertz are sounded simultaneously. What sound will the listener hear?
    (Answer 4 Hz beats and 322 Hz frequency)

8. When a string 0.5 meter long is stretched with a force of 2.5×10^2 Newton's, its frequency is 440 hertz. If the string is shortened to .4 meters and the stretching force is increased to 5.0×10^2 Newton's, what is the new frequency?
    (Answer 777.82)

9. Sound intensity at the hearing threshold is approximately 1×10^{-14} watt/cm^2 for a sound   frequency of 200 hertz. The pain threshold is reached for sound at this frequency when the intensity is increased by 110 decibels. Calculate the intensity of this sound at the pain threshold.   (Answer 1.0×10^{-3} watts/cm^2 or 10 watts/m^2)

10. Middle C on the piano keyboard is tuned to 261.6 hertz when the temperature is 20 C^o. Calculate A) the frequency, and B) the wavelength in air of the highest note on the keyboard that is exactly 4 octaves above middle C. (Answer .082 meters)

11.   An organ pipe open at both ends is 1.23 meters long and has a diameter of 10 centimeters. A) What is its fundamental frequency when the air temperature is 15 degrees Celsius?   B) What are the frequencies fo the two lowest harmonics produced along with the fundamental tone? (answer 130 Hz, 260 Hz, 390 Hz)

12.   An organ pipe closed at one end is 0.76 meters long and has a diameter of 5.0 centimeters. The air temperature is 12 degrees

Celsius. A) Determine its fundamental frequency. B) What are the frequencies of the two lowest harmonics produced along with this fundamental tone?   (Answer 108.6 Hz, 325.8 Hz, 543 Hz)

13.   What is the frequency of a tuning fork that resonates with an open tube .7 meter long and 3.0 centimeters in diameter

when the temperature is 12 degrees Celsius? (Answer 233.91 Hz)

14.   A tuning fork, frequency 484 hertz, produces resonance with a closed tube 40.0 centimeters long and 2.0 centimeters in

diameter. What is the speed of sound?   (Answer m/s)