

1 Two sound sources S_1 and S_2 produce waves with frequencies 1000 Hz and 500 Hz. When we compare the speed of wave 1 to the speed of wave 2 the result is:

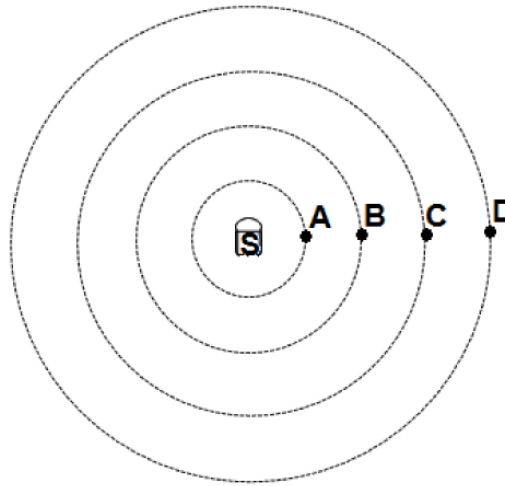
- ☐ **A Twice as greater**
- ☐ **B One-half as greater**
- ☐ **C The same**
- ☐ **D Four times greater**
- ☐ **E One-fourth as greater**

2 Which of the following is a true statement about the speed of sound in three different materials: air, water, and steel?

- ☐ **A** $V_{\text{air}} > V_{\text{water}} > V_{\text{steel}}$
- ☐ **B** $V_{\text{air}} > V_{\text{water}} = V_{\text{steel}}$
- ☐ **C** $V_{\text{air}} = V_{\text{water}} < V_{\text{steel}}$
- ☐ **D** $V_{\text{air}} < V_{\text{water}} > V_{\text{steel}}$
- ☐ **E** $V_{\text{air}} < V_{\text{water}} < V_{\text{steel}}$

- 3 A sound source S radiates a sound wave in all directions. The relationship between the distances is $SA = AB = BC = CD$. Which of the following points oscillates at the highest frequency?

- ☐ A Point A
- ☐ B Point B
- ☐ C Point C
- ☐ D Point D
- ☐ E All points have the same frequency



4 The loudness of a sound wave increases with increasing which of the following:

- ☐ **A Frequency**
- ☐ **B Amplitude**
- ☐ **C Period**
- ☐ **D Wavelength**
- ☐ **E Speed of sound**

5 A sound wave travels from air into water. Which of the following doesn't change?

- ☐ **A Frequency**
- ☐ **B Amplitude**
- ☐ **C Speed of Particles**
- ☐ **D Wavelength**
- ☐ **E Speed of sound**

6 A sound wave resonates in a tube with two open ends. What are the wavelengths of the three lowest resonating frequencies generated in the tube?

- ☐ **A L, 2L, 3L**
- ☐ **B 2L, L, 2L/3**
- ☐ **C L/2, L/3, L/5**
- ☐ **D L/3, L/5, L/7**
- ☐ **E 4L, 4L/3, 4L/5**

**7 The lowest frequency in an open tube is 250 Hz.
What are the three following frequencies will
resonate in the tube?**

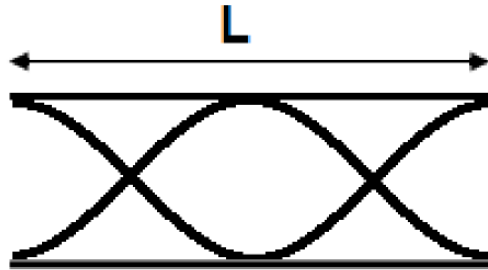
- ☐ **A 500Hz, 750Hz, 1000Hz**
- ☐ **B 100Hz, 200Hz, 400Hz**
- ☐ **C 250Hz, 500Hz, 750Hz**
- ☐ **D 150Hz, 450Hz, 850Hz**
- ☐ **E 50Hz, 100Hz, 150Hz**

**8 The lowest frequency in an open tube is 100 Hz.
Which of the following frequencies will resonate in
the tube?**

- ☐ **A 25Hz**
- ☐ **B 50Hz**
- ☐ **C 150Hz**
- ☐ **D 200 Hz**
- ☐ **E 250Hz**

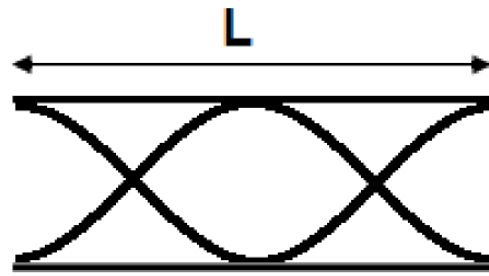
9 A sound wave resonates in an open pipe with a length of 1 m. What is the wavelength of the wave?

- ☐ **A 0.5 m**
- ☐ **B 1.0 m**
- ☐ **C 1.5 m**
- ☐ **D 2.0 m**
- ☐ **E 2.5 m**



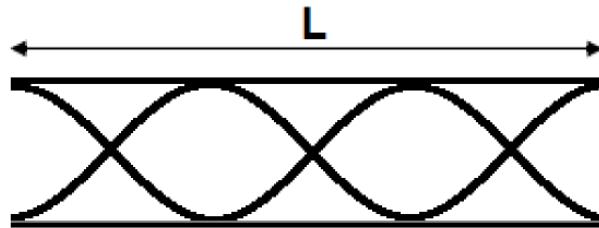
10 A sound wave resonates in an open pipe with a length of 2 m. What is the resonating frequency?
($V_{\text{sound}} = 340 \text{ m/s}$)

- ☐ A 85 Hz
- ☐ B 170 Hz
- ☐ C 340 Hz
- ☐ D 510 Hz
- ☐ E 680 Hz



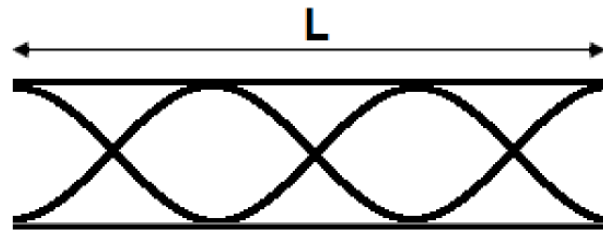
11 A sound wave resonates in an open pipe with a length of 6 m. What is the wavelength of the wave?

- ☐ **A 1.5 m**
- ☐ **B 2.0 m**
- ☐ **C 3.0 m**
- ☐ **D 4.0 m**
- ☐ **E 6.0 m**



12 A sound wave resonates in an open pipe with a length of 1.5 m. What is the resonating frequency? ($V_{\text{sound}} = 340 \text{ m/s}$)

- ☐ A 85 Hz
- ☐ B 170 Hz
- ☐ C 340 Hz
- ☐ D 510 Hz
- ☐ E 680 Hz



13 A sound wave resonates in a tube with one open end. What are the wavelengths of the three lowest resonating frequencies generated in the tube?

- ☐ **A $L, 2L, 3L$**
- ☐ **B $L, 2L, 2L/3$**
- ☐ **C $L/2, L/3, L/5$**
- ☐ **D $L/3, L/5, L/7$**
- ☐ **E $4L, 4L/3, 4L/5$**

14 The lowest frequency in a closed tube is 200 Hz. What are the three following frequencies will resonate in the tube?

- ☐ **A 600Hz, 1000Hz, 1400Hz**
- ☐ **B 100Hz, 200Hz, 400Hz**
- ☐ **C 400Hz, 600Hz, 800Hz**
- ☐ **D 900Hz, 1500Hz, 2100Hz**
- ☐ **E 50Hz, 100Hz, 150Hz**

**15 The lowest frequency in a closed tube is 300 Hz.
Which of the following frequencies will resonate in
the tube?**

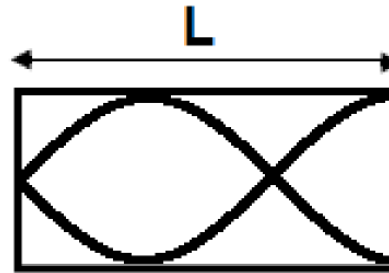
- ☐ **A 900Hz**
- ☐ **B 1000Hz**
- ☐ **C 1200Hz**
- ☐ **D 2500 Hz**
- ☐ **E 3000Hz**

16 Two sound sources generate pure tones of 500 Hz and 525 Hz. What is the beat frequency?

- ☐ **A 5Hz**
- ☐ **B 10Hz**
- ☐ **C 15Hz**
- ☐ **D 20Hz**
- ☐ **E 25Hz**

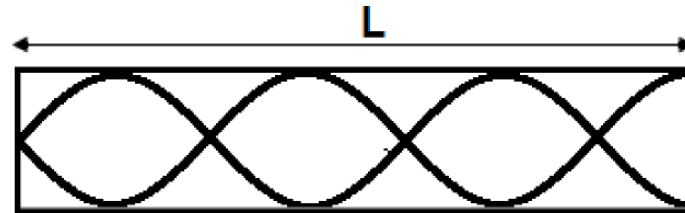
17 A sound wave resonates in a closed pipe with a length of 3.0m. What is the wavelength of the wave?

- ☐ A 1.5 m
- ☐ B 2.0 m
- ☐ C 3.0 m
- ☐ D 4.0 m
- ☐ E 6.0 m



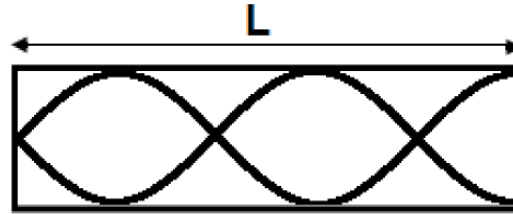
18 A sound wave resonates in a closed pipe with a length of 3.5 m. What is the wavelength of the wave?

- ☐ A 1.5 m
- ☐ B 2.0 m
- ☐ C 2.5 m
- ☐ D 3.0 m
- ☐ E 6.0 m



19 A sound wave resonates in a closed pipe with a length of 2.5 m. What is the resonating frequency? ($V_{\text{sound}} = 340 \text{ m/s}$)

- ☐ A 85 Hz
- ☐ B 170 Hz
- ☐ C 340 Hz
- ☐ D 510 Hz
- ☐ E 680 Hz



20 Two sound sources produce waves with slightly different frequencies. What happens with the beat frequency if the frequency of the lowest tone increases and passed the higher tone?

- ☐ **A Increases**
- ☐ **B Decreases**
- ☐ **C Stays the same**
- ☐ **D Increases and then decreases**
- ☐ **E Decreases and then increases**