**banner**

**PH 1140 Acoustics Lab Report**

**Name? 7.5/10**

1. **Immediately below this problem statement show with fussy precision of spacing the air pressure node (N)/antinode (A) patterns for the fourth and fifth resonances for the two cases: (a) a tube with both ends open, and (b) a tube with one end open, one end closed. Indicate where the ends of the tubes are relative to your NA… pattern, especially the closed end of (b).**

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**Both open (4th): A N A N A N A N A**

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**Both open (5th): A N A N A N A N A N A**

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**1 closed (4th): A N A N A N A N|**

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**1 closed (5th): A N A N A N A N A N|**

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**You got the geometry right but for displacement, not pressure**

1. **Calculate the theoretical frequency of the sixth resonance for the two tubes mentioned above, given that the length of tube (a) is L = 1.7 m, and the length of tube (b) is L = 1.2 m. Use a speed of sound in air of 344 m/s.**

**ok**

1. **For the two tubes specified in Problem 2, calculate the theoretical distance between adjacent nodes and antinodes for the sixth resonance frequency in each tube-type, (a) and (b). Also calculate the respective sixth resonance wavelengths.**

**See above, where λ is calculated. The distance between adjacent nodes (n→n) and antinodes (an→an) is the same as the wavelength.**

**It’s ¼ lambda**

1. **The average human vocal tract length from larynx to lips is 17.5 cm. That vocal tract filters the frequency content of the pressure wave generated in the larynx, and if we model the vocal tract as a cylindrical tube of 17.5 cm in length, closed at one end, determine the frequencies of the first five resonances in the vocal tract, assuming a speed of sound of 344 m/s. (Part of the reason we can articulate so many different speech sounds is because the vocal tract has a lot of movable parts in it that can change the natural resonances of the vocal tract far from that of a cylindrical tube of 17.5 cm length, closed at one end!)**

**ok**