Questions on Tubes.

1. How are the modes of vibration of a string different from the modes of vibration of air in a tube?
2. How are the modes of vibration of air in a tube that is closed at one end different than those of one open at both ends?
3. What is the difference between pressure nodes and displacement nodes in a tube instrument?
4. What are pressure anti-nodes and where are they located in a tube instrument for the first few modes?
5. How is the length of a tube related to the fundamental frequency of vibration of air inside a tube open at both ends?
6. How is the length of a tube related to the fundamental frequency of vibration of air inside a tube open at only one end?
7. How can the fundamental frequency of a tube instrument be changed?
8. What is the general definition of impedance?
9. Why is some impedance necessary for tube instruments?
10. In a tube instrument, how are standing waves established in the tube?
11. Why does introducing finger holes in a flute affect the frequency played?
12. Holes on a tube instrument change the frequencies being played. List some problems with using holes for this purpose.
13. What vibrates to produce the initial sound in each of the following instruments: Oboe, clarinet, flute, pipe organ, trumpet, trombone.
14. What is embouchure and why is it important?
15. Explain how a flute works without a reed to vibrate.
16. What is an edge tone?
17. Brass instruments are generally louder than woodwind instruments because they have bigger bells. Why does a bigger bell make the instrument sound louder?
18. What other effects does a bell have on an instrument besides making it sound louder?
19. Clarinets and trumpets are both tube instruments but they have very different timbre. What are some factors that cause the timbre to be different?
20. How do the following instruments change the pitch they are playing: Slide trombone, trumpet, flute, French horn, clarinet, saxophone, flute, pipe organ.
21. A didgeridoo is a long lube of wood, an instrument used by Aboriginals in Australia. How is the sound produce? Is there any impedance? Explain your answers.
22. Harmonicas, accordions, and bandoleóns all belong to what type of non-tube instrument? How do they work?