

Questions on Pitch, Loudness, Timbre.

1. What does the fundamental frequency of an instrument determine?
2. What is the difference between pitch and fundamental frequency?
3. What subjective quantity corresponds to the scientific measurement of the fundamental frequency?
4. How do we measure sound intensity in the laboratory?
5. What subjective quantity corresponds to the scientific measurement of sound intensity?
6. The energy per second per area in W/m^2 is one way to measure sound intensity. What other scale is used?
7. What is the typical range of frequencies that a human can hear if they have perfect hearing?
8. How are the frequency ranges of animals different from the range humans can hear? (Give some examples.)
9. What is ultrasound?
10. What is the difference between sound intensity and sound intensity level? What units are used for each?
11. What is the difference between the phon measurement and the decibel measurement?
12. Suppose one clarinet has a measured loudness of 30 dB. How loud will five identical clarinets together be?
13. What is the sound intensity level in dB for a sound with intensity of 1 W/m^2 ?
14. A vacuum cleaner is about 100 times as loud as ordinary conversation as measured in W/m^2 . How much of a difference is this in dB?
15. How loud are rustling leaves in dB? In W/m^2 ?
16. In the graph of phons compared to SIL and sound intensity at different frequencies, why does the phon curve take a dip between 3000 Hz and 5000 Hz?
17. What is just noticeable difference in frequency?
18. According to the chart in this chapter, what is the JND (Hz) at 1000 Hz? At 4000 Hz?
19. What is just noticeable difference in loudness?
20. For a 1000 Hz sound, what is the JND (dB) at 20 dB? At 50 dB?
21. What is timbre and what causes it?
22. Pitch is mainly related to the fundamental frequency. But what other factors affect perceived pitch (what else affects the pitch that we think we hear)?
23. Loudness is mainly related to the sound intensity. But what other factors affect perceived loudness (what else affects the loudness that we think we hear)?
24. Explain the difference between subjective measures of pitch, loudness and timbre as compared to the objective measurements of fundamental frequency, sound intensity and waveform.