

## Questions on Acoustics.

1. Define acoustics.
2. What are some of the acoustic qualities to be considered when planning a music or concert hall?
3. Who was Marcus Vitruvius Pollio and what did he do?
4. What is the principle behind Echeas?
5. Explain the idea of reverberation.
6. Why would you not want to get rid of reverberation entirely?
7. What does it mean if the absorptivity or absorption coefficient is zero?
8. Absorption is measured in what units?
9. If the distance to a sound source is doubled, that happens to the sound intensity?
10. What is the Comb effect and why is it useful?
11. Explain feedback (what is it, when does it occur, why does it occur).
12. What is a way to minimize echoes in a concert hall?
13. Why is some reverberation a good thing for organs?
14. What is one of the largest factors that impact the sound of a musical performance?
15. Why do auditoriums have slanted walls and floors?
16. In addition to reverberation our ear-brain hearing system uses four other methods to determine the direction to a sound source. Write a brief description of each.
17. What is the precedence effect?
18. How are we fooled at a concert to think the sound we hear is coming from the singer and not from the speakers on each side?
19. Why do speakers overhead not cause us to think the musicians are on the ceiling?
20. Is it possible to design a perfect concert hall using only scientific principles? Explain your answer.
21. Why are multiple speakers aligned in a plane going away from the stage each given a slight delay?
22. Name a famous rocker that used feedback from his guitar as a piece in his music.
23. What two problems do standing waves pose for sound in a room?
24. How can dead spots be reduced in a room?
25. A person is singing on stage, but their voice is amplified by speakers that are closer to the audience. How can you make it so the audience perceives the sound originating from the stage and not the speaker?
26. How does our perception of the direction of sound from a vertical angle differ from a horizontal angle?