**Concept Review: Waves & Sound**

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period \_\_\_\_\_\_

**Chapter 26: Sound**

20. What is the source of all sounds?

21. How does pitch relate to frequency?

22. What is the average frequency range of a young person’s hearing?

23. Distinguish between infrasonic and ultrasonic sound.

24. a. Distinguish between compressions and rarefactions of a sound wave.

b. How are compressions and rarefactions produced?

25. Light can travel through a vacuum, as is evidenced when you see the sun or the moon. Can sound travel through a vacuum also? Explain why or why not.

26. a. How fast does sound travel in dry air at room temperature?

b. How does air temperature affect the speed of sound?

27. How does the speed of sound in air compare with its speed in water and in steel?

28. Why does sound travel faster in solids and liquids than in gases?

29. When watching a baseball game, we often hear the bat hitting the ball after we actually see the hit. Why?

30. You watch a distant farmer driving a stake into the ground with a sledgehammer. He hits the stake at a regular rate of one stroke per second. You hear the sound of the blows exactly synchronized with the blows you see. And then you hear one more blow after you see him stop hammering. How far away is the farmer?

31. What time is required for sound to travel 5.00 km if the temperature of the air is 10 ºC?

32. What is the wavelength, in meters, of the sound produced by a tuning fork that has a frequency of 320 Hz? The temperature of the air is 15 ºC.

33. Sound waves travel at approximately 340 m/s. What is the wavelength of a sound with a frequency of 20 Hz (the lowest note we can hear as a sound)? What is the wavelength of a sound with a frequency of 20 kHz (the highest note we can hear)?

34. Suppose you wish to produce a sound wave that has a wavelength of 1 m in room temperature air. What would its frequency be?

35. An oceanic depth-sounding vessel surveys the ocean bottom with ultrasonic sound that travels 1530 m/s in seawater. Find the depth of the water if the time delay of the echo to the ocean floor and back is 8 seconds.

36. Why do different objects make different sounds when dropped on a floor?

37. What does it mean to say that everything has a natural frequency of vibration?

38. Why can a tuning fork or bell be set into resonance, while tissue paper cannot?

39. How is resonance produced in a vibrating object?

40. What does tuning in a radio station have to do with resonance?

41. Is it possible for one sound wave to cancel another? Explain.

42. Why does destructive interference occur when the path lengths from two identical sources differ by half a wavelength?

43. How does interference of sound relate to beats?

44. Suppose a piano tuner hears 2 beats per second when listening to the combined sound from her tuning fork and the piano note being tuned. After slightly tightening the string, she hears 1 beat per second. Should she loosen or should she further tighten the string?

45. Two sounds, one at 240 Hz and the other at 243 Hz, occur at the same time. What beat frequency do you hear?

46. Two notes are sounding, one of which is 440 Hz. If a beat frequency of 5 Hz is heard, what is the other note’s frequency?