Worksheet: Sound

NIOS · Class 9 · Science · 16 questions · 45 marks

Name: _____ Date: _____ Score: _____ / 45

Q1. What kind of wave is sound — transverse or longitudinal? Justify your answer. *[1 mark]*

Q2. A wave has frequency 500 Hz and wavelength 0.5 m. Find its speed. *[1 mark]*

Q3. Differentiate pitch and loudness of sound. On which wave property does each depend? *[2 marks]*

Q4. Classify each as audible, infrasonic, or ultrasonic for humans: (a) 10 Hz, (b) 500 Hz, (c) 25,000 Hz, (d) 18,000 Hz. *[2 marks]*

Q5. Why do we hear an echo only when we are at least 17 m away from a wall? *[2 marks]*

Q6. A radio station broadcasts at frequency 100 MHz. Find the wavelength. (Speed of EM waves in air = 3 × 10x m/s) *[2 marks]*

Q7. A SONAR device sends an ultrasonic pulse into the sea. The reflected pulse from the ocean floor is received 4 s later. If sound speed in sea water is 1500 m/s, find the depth. *[3 marks]*

Q8. A tuning fork produces 256 vibrations per second. If sound travels at 340 m/s in air, find the wavelength of the sound. *[3 marks]*

Q9. A man fires a gun and hears the echo from a cliff 2 s later. If the speed of sound is 340 m/s, find the distance of the cliff from the man. *[3 marks]*

Q10. Why does sound travel faster in iron than in air? *[3 marks]*

Q11. A boy stands between two parallel cliffs and claps his hands. He hears two distinct echoes after 2 s and 4 s respectively. Find the distance between the two cliffs. (Speed of sound = 340 m/s) *[4 marks]*

Q12. A wave has time period 0.005 s and travels at 300 m/s in a medium. Find its frequency and wavelength. *[3 marks]*

Q13. A sound wave has frequency 500 Hz. Find its wavelength in (a) air, (b) water, (c) steel. (Speeds: air 340 m/s, water 1500 m/s, steel 5960 m/s). *[4 marks]*

Q14. Bats use ultrasonic waves for navigation. Explain how a bat can find its prey in the dark. *[4 marks]*

Q15. If sound takes 6 s to travel through 2 km of water and 1.0 s in air for 340 m, calculate the ratio of speeds of sound in water and air. *[4 marks]*

Q16. Give two medical and two industrial applications of ultrasound. *[4 marks]*