# Worksheet: Waves

Tamil Nadu State Board · Class 11 · Physics · 10 questions · 31 marks

| Name: _____ | Date: _____ | Score: _____ / 31 |
|---|---|---|

**Q1.** A wave is described by y(x,t) = 0.02 sin(4x - 2t) m. Find its wavelength and period. *[2 marks]*

**Q2.** A string of linear mass density 0.05 kg/m is under a tension of 20 N. Find the speed of a transverse wave on it. *[2 marks]*

**Q3.** Two sound waves of frequency 256 Hz and 260 Hz are superposed. Find the beat frequency. *[2 marks]*

**Q4.** Find the speed of sound in a gas at pressure 1.0 x 10^5 Pa and density 1.3 kg/m^3, given gamma = 1.4. *[3 marks]*

**Q5.** A wave is given by y(x,t) = 5 sin(3x + 6t) cm. Find its speed and direction of propagation. *[3 marks]*

**Q6.** A stationary wave on a string has nodes 15 cm apart. Find the wavelength. *[3 marks]*

**Q7.** A string of length 1.2 m, fixed at both ends, carries transverse waves at speed 60 m/s. Find its fundamental frequency. *[3 marks]*

**Q8.** A pipe closed at one end has length 0.5 m. Taking the speed of sound as 340 m/s, find its fundamental frequency. *[3 marks]*

**Q9.** A resonance tube (closed at the water-level end) resonates with a 512 Hz tuning fork at air-column lengths of 16.4 cm and 50.5 cm (successive resonances). Find the speed of sound in air, and estimate the end correction. *[5 marks]*

**Q10.** Two tuning forks A and B produce 4 beats per second. When B is loaded with a bit of wax (which lowers its frequency), the beat frequency decreases to 2 beats per second. If the frequency of A is 256 Hz, find the original frequency of B. *[5 marks]*