Worksheet: Waves

Maharashtra 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]*