JEE

Prayas JEE (2025)

Physics

Waves

DPP: 5

Q1 v_1 and v_2 are the velocities of sound at the same temperature in two monoatomic gases of densities ρ_1 and ρ_2 respectively. If $\rho_1/\rho_2 = \frac{1}{4}$ then the ratio of velocities v_1 and v_2 will be
(A) $1:2$
(B) $4:1$
(C) $2:1$
(D) $1:4$

Q2 Intensity level of a sound of intensity I is $30\ \mathrm{dB}$. The ratio I/I_0 is (I_0 is the threshold of hearing)
(A) 1000 (B) 2000
(C) 100 (D) 20

Q3 The loudness and pitch of a sound depends on
(A) Intensity and velocity
(B) Frequency and velocity
(C) Intensity and frequency
(D) Frequency and number of harmonics

Q4 The temperature at which the speed of sound in air becomes double of its value at $27^\circ\mathrm{C}$ is
(A) $54^\circ\mathrm{C}$
(B) $327^\circ\mathrm{C}$
(C) $927^\circ\mathrm{C}$
(D) $-123^\circ\mathrm{C}$

Q5 The phase difference between two points separated by $1\ \mathrm{m}$ in a wave of frequency $120\ \mathrm{Hz}$ is 90°. The wave velocity is
(A) $180\ \mathrm{m/s}$
(B) $240\ \mathrm{m/s}$
(C) $480\ \mathrm{m/s}$
(D) $720\ \mathrm{m/s}$

Q6 The wavelength of the sound emitted by a tuning fork in air is $3\ \mathrm{m}$. Speeds of sound in air and in water are $330\ \mathrm{m/s}$ and $1400\ \mathrm{m/s}$ respectively. Wavelength of this sound in water is
(A) $1\ \mathrm{m}$
(B) $1.2\ \mathrm{m}$
(C) $110\ \mathrm{m}$
(D) $12.72\ \mathrm{m}$

Q7 The temperature at which the speed of sound in air will be double that at $27^\circ\mathrm{C}$ is
(A) $819^\circ\mathrm{C}$
(B) $927^\circ\mathrm{C}$
(C) $6127^\circ\mathrm{C}$
(D) $4[illegible]^\circ$

Q8 The velocity of sound in air at $27^\circ\mathrm{C}$ is $330\ \mathrm{m/s}$. The velocity of sound when the temperature of the gas is raised to $227^\circ\mathrm{C}$ is
(A) $330\ \mathrm{m/s}$
(B) $660\ \mathrm{m/s}$
(C) $426\ \mathrm{m/s}$
(D) $213\ \mathrm{m/s}$

Q9 If the velocity of sound in helium at room temperature is $330\ \mathrm{m/s}$, then the velocity of sound in hydrogen is
(A) $330\ \mathrm{m/s}$
(B) $427.7\ \mathrm{m/s}$
(C) $1500\ \mathrm{m/s}$
(D) $5900\ \mathrm{m/s}$

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Answer Key

Q1	(C)
Q2	(A)
Q3	(C)
Q4	(C)
Q5	(C)
Q6	(D)
Q7	(B)
Q8	(C)
Q9	(B)