



Chapter : WAVES

Assignment 1

Class 11

Topic :- WAVES

- Two sound waves (expressed in CGS units) given by $y_1 = 0.3 \sin \frac{2\pi}{\lambda}(vt - x)$ and $y_2 = 0.4 \sin \frac{2\pi}{\lambda}(vt - x + \theta)$ interfere. The resultant amplitude at a place where phase difference is $\pi/2$ will be
a) 0.7 cm b) 0.1 cm c) 0.5 cm d) $\frac{1}{10} \sqrt{7}$ cm
- Sound waves of wavelength greater than that of audible sound are called
a) Seismic waves b) Sonic waves c) Ultrasonic waves d) Infrasonic waves
- A bus is moving with a velocity of 5ms^{-1} towards a huge wall. The driver sounds a horn of frequency 165 Hz. If the speed of sound in air is 335ms^{-1} , the number of beats heard per second by a passenger inside the buss will be
a) 3 b) 4 c) 5 d) 6
- When a sound wave of frequency 300 Hz passes through a medium, the maximum displacement of a particle of the medium is 0.1 cm. the maximum velocity of the particle is equal to
a) 60 cm/s b) 30 cm/s c) 60π cm/s d) 30π cm/s
- Standing waves are produced in a 10 m long stretched string. If the string vibrates in 5 segments and the wave velocity is 20 m/s, the frequency is
a) 2 Hz b) 4 Hz c) 5 Hz d) 10 Hz
- The fundamental frequencies of an open and a closed tube, each of same length L with v as the speed of sound in air, respectively are
a) $\frac{v}{2L}$ and $\frac{v}{L}$ b) $\frac{v}{L}$ and $\frac{v}{2L}$ c) $\frac{v}{2L}$ and $\frac{v}{4L}$ d) $\frac{v}{4L}$ and $\frac{v}{2L}$
- Energy is not carried by which of the following waves
a) Stationary b) Progressive c) Transverse d) Electromagnetic
- When the temperature of an ideal gas is increased by 600 K, the velocity of sound in the gas becomes $\sqrt{3}$ times the initial velocity in it. The initial temperature of the gas is

- a) -73°C b) 27°C c) 127°C d) 327°C
9. Find the fundamental frequency of a closed pipe, if the length of the air column is 42 m. (speed of sound in air = 332 m/sec)
- a) 2 Hz b) 4 Hz c) 7 Hz d) 9 Hz
10. When 2 tuning forks (fork 1 and fork 2) are sounded simultaneously, 4 beats s^{-1} are heard. Now, some tape is attached on the prong of fork 2. When the tuning forks are sounded again, 6 beats s^{-1} are heard if the frequency of fork 1 is 200 Hz, then what was the original frequency of fork 2?
- a) 196 Hz b) 200 Hz c) 202 Hz d) 204 Hz
11. Sound of the wavelength λ passes through a Quincke's tube, which is adjust to give a maximum intensity I_0 . Through what distance should the sliding tube be moved to give intensity $I_0/2$?
- a) $\lambda/2$ b) $\lambda/3$ c) $\lambda/4$ d) $\lambda/8$
12. Two waves represented by $y = a \sin(\omega t - kx)$ and $y = a \cos(\omega t - kx)$ are superposed. The resultant wave will have an amplitude
- a) a b) $\sqrt{2}a$ c) $2a$ d) Zero
13. In a resonance pipe the first and second resonance are obtained at depths 22.7 cm and 70.2 cm respectively. What will be the end correction?
- a) 1.05 cm b) 115.5 cm c) 92.5 cm d) 113.5 cm
14. A transverse wave is described by the equation $y = y_0 \sin 2\pi \left[ft - \frac{x}{\lambda} \right]$. The maximum particle velocity is equal to four times the wave velocity if
- a) $\lambda = \pi y_0/4$ b) $\lambda = 2\pi y_0$ c) $\lambda = \pi/y_0$ d) $\lambda = \pi y_0/2$
15. A tuning fork produces waves in a medium. If the temperature of the medium changes, then which of the following will change
- a) Amplitude b) Frequency c) Wavelength d) Time-period
16. From a point source, if amplitude of waves at a distance r is A , its amplitude at a distance $2r$ will be
- a) A b) $2A$ c) $A/2$ d) $A/4$
17. If T is the reverberation time of an auditorium of volume V then
- a) $T \propto \frac{1}{V}$ b) $T \propto \frac{1}{V^2}$ c) $T \propto V^2$ d) $T \propto V$
18. In an experiment, it was found that string vibrates in n loops when a mass M is placed on the pan. What mass should be placed on the pan to make it vibrate in $2n$ loops, with same frequency. Neglect the mass of the pan.
- a) $M/4$ b) $4M$ c) $2M$ d) $M/2$

19. A source of sound emits waves with frequency f Hz and speed V m/sec. Two observers move away from this source in opposite directions each with a speed $0.2V$ relative to the source. The ratio of frequencies heard by the two observers will be
- a) 3 : 2 b) 2 : 3 c) 1 : 1 d) 4 : 10
20. Speed of sound at constant temperature depends on
- a) Pressure b) Density of gas c) Above both d) None of the above

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