

DPP

DAILY PRACTICE PROBLEMS

CLASS : XITH
DATE :

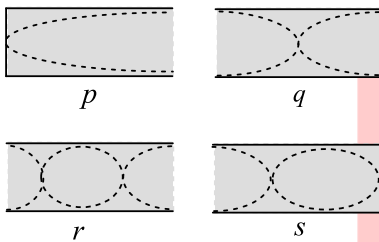
SUBJECT : PHYSICS
DPP NO. :5

Topic :- WAVES

- How many times more intense is a 60 dB sound than a dB sound?
a) 1000 b) 2 c) 100 d) 4
- If the phase difference between two sound waves of wavelength λ is 60° , the corresponding path difference is
a) $\frac{\lambda}{6}$ b) $\frac{\lambda}{2}$ c) 2λ d) $\frac{\lambda}{4}$
- The equation of progressive wave is $y = 0.2 \sin 2\pi \left[\frac{t}{0.01} - \frac{x}{0.3} \right]$, where x and y are in metre and t is in second. The velocity of propagation of the wave is
a) 30 ms^{-1} b) 40 ms^{-1} c) 300 ms^{-1} d) 400 ms^{-1}
- The velocity of sound hydrogen is 1224 ms^{-1} . Its velocity in mixture of hydrogen and oxygen containing 4 parts by volume of hydrogen and 1 part oxygen is
a) 1224 ms^{-1} b) 612 ms^{-1} c) 2448 ms^{-1} d) 306 ms^{-1}
- Two adjacent piano keys are struck simultaneously. The notes emitted by them have frequencies n_1 and n_2 . The number of beats heard per second is
a) $\frac{1}{2}(n_1 - n_2)$ b) $\frac{1}{2}(n_1 + n_2)$ c) $n_1 \sim n_2$ d) $2(n_1 - n_2)$
- Two sound waves with wavelengths 5.0 m and 5.5 m respectively, each propagate in a gas with velocity 330 m/s . We expect the following number of beats per second
a) 1 b) 6 c) 12 d) 0
- A progressive wave $y = a \sin [(kx - \omega t)]$ is reflected by a rigid wall at $x = 0$. Then the reflected wave can be represented by
a) $y = a \sin (kx + \omega t)$ b) $y = a \cos (kx + \omega t)$ c) $y = -a \sin (kx - \omega t)$ d) $y = -a \sin (kx + \omega t)$
- Mechanical waves on the surface of a liquid are
a) Transverse b) Longitudinal
c) Torsional d) Both transverse and longitudinal

9. It is possible to hear beats from the two vibrating sources of frequency
 a) 100 Hz and 150 Hz b) 20 Hz and 25 Hz
 c) 400 Hz and 500 Hz d) 1000 Hz and 1500 Hz
10. If v is the speed of sound in air then the shortest length of the closed pipe which resonates to a frequency v , is
 a) $\frac{v}{2v}$ b) $\frac{v}{4v}$ c) $\frac{4v}{v}$ d) $\frac{2v}{v}$
11. Radar waves are sent towards a moving aeroplane and the reflected wave are received. When the aeroplane is moving towards the radar, the wavelength of the wave
 a) Decreases
 b) Increases
 c) Remains the same
 d) Sometimes increases or decreases

12. The vibrating of four air columns are represented in the figure. The ratio of frequencies $n_p : n_q : n_r : n_s$ is



- a) 12:6:3:5 b) 1:2:4:3 c) 4:2:3:1 d) 6:2:3:4

13. If wave $y = a \cos(\omega t + kx)$ is moving along x-axis, the shape of pulse at $t=0$ and $t=2s$
 a) Are different b) Are same c) May not be same d) None of these

14. The equation of a wave is given by $y = 10 \sin\left(\frac{2\pi}{45}t + a\right)$. If the displacement is 5 cm at $t=0$, then the total phase at $t=7.5s$ is

- a) π b) $\frac{\pi}{6}$ c) $\frac{\pi}{2}$ d) $\frac{\pi}{3}$

15. A micro-wave and an ultrasonic sound wave have the same wavelength. Their frequencies are in the ratio (approximately)

- a) $10^6 : 1$ b) $10^4 : 1$ c) $10^2 : 1$ d) $10 : 1$

16. A stationary source is emitted sound at a fixed frequency f_0 , which is reflected by two cars approaching the source. The difference between the frequencies of sound reflected from the car is 1.2% of f_0 . What is the difference in the speed of the cars (in km per hour) to the nearest integer? The cars are moving at constant speeds much smaller than the speed of sound which is $330ms^{-1}$

- a) 7.128 km/h b) 7 km/h c) 8.128 km/h d) 9 km/h

17. A travelling wave represented by $y = a \sin(\omega t - kx)$ is superimposed on another wave represented by $y = a \sin(\omega t + kx)$. The resultant is
- a) A standing wave having nodes at $x = \left(n + \frac{1}{2}\right) \frac{\lambda}{2}, n = 0,1,2$
 - b) A wave travelling along + x direction
 - c) A wave travelling along - x direction
 - d) A standing wave having nodes at $x = \frac{n\lambda}{2}; n = 0,1,2$
18. Consider ten identical sources of sound all giving the same frequency but having phase angles which are random. If the average intensity of each source is I_0 , the average of resultant intensity I due to all these ten sources will be
- a) $I = 100I_0$
 - b) $I = 10I_0$
 - c) $I = I_0$
 - d) $I = \sqrt{10}I_0$
19. When both the listener and source are moving towards each other, then which of the following is true regarding frequency and wavelength of wave observed by the observer?
- a) More frequency, less wavelength
 - b) More frequency, more wavelength
 - c) Less frequency, less wavelength
 - d) More frequency, constant wavelength
20. If you set up the seven overtone on a string fixed at both ends, how many nodes and antinodes are set up in it?
- a) 6,5
 - b) 5,4
 - c) 4,3
 - d) 3,2

