

# DPP

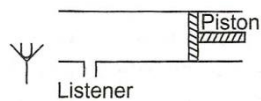
DAILY PRACTICE PROBLEMS

CLASS : XI<sup>TH</sup>  
DATE :

SUBJECT : PHYSICS  
DPP NO. :2

## Topic :- WAVES

- Which of the following has high pitch in their sound  
a) Lion                      b) Mosquito                      c) Man                      d) Woman
- When temperature increases, the frequency of a tuning fork  
a) Increases  
b) Decreases  
c) Remains same  
d) Increases or decreases depending on the material
- The type of waves that can be propagated through solid is  
a) Transverse                      b) Longitudinal                      c) Both (a) and (b)                      d) None of these
- The equation of stationary wave along a stretched string is given by  $y = 5 \sin \frac{\pi x}{3} \cos 40\pi t$  where  $x$  and  $y$  are in centimetre and  $t$  in second. The separation between two adjacent nodes is  
a) 6 cm                      b) 4 cm                      c) 3 cm                      d) 1.5 cm
- A pipe open at both ends produces a note of frequency  $f_1$ . When the pipe is kept with  $\frac{3}{4}$ th of its length in water, it produced a note of frequency  $f_2$ . The ratio  $\frac{f_1}{f_2}$  is  
a)  $\frac{3}{4}$                       b)  $\frac{4}{3}$                       c)  $\frac{1}{2}$                       d) 2
- The source of sound generating a frequency of 3kHz reaches an observer with a speed of 0.5 times, the velocity of sound in air. The frequency heard by the observer is  
a) 1 kHz                      b) 2 kHz                      c) 4 kHz                      d) 6 kHz
- A long cylindrical tube carries a highly polished piston and has a side opening. A tuning fork of frequency  $n$  is sounded at the sound heard by the listener changes if the piston is moved in or out. At a particular position of the piston is moved through a distance of 9 cm, the intensity of sound becomes minimum, if the speed of sound is 360 m/s, the value of  $n$  is



- a) 129.6 Hz                      b) 500 Hz                      c) 1000 Hz                      d) 2000 Hz

8.  $n_1$  is the frequency of the pipe closed at one end and  $n_2$  is the frequency of the pipe open at both ends. If both are joined end to end, find the fundamental frequency of closed pipe so formed

a)  $\frac{n_1 n_2}{n_2 + 2n_1}$                       b)  $\frac{n_1 n_2}{2n_2 + n_1}$                       c)  $\frac{n_1 + 2n_2}{n_2 n_1}$                       d)  $\frac{2n_1 + n_2}{n_2 n_1}$

9. Two sounding bodies producing progressive waves are given by  $y_1 = 4 \sin 400\pi t$  and  $y_2 = 3 \sin 404\pi t$  one situated very near to the ear of a person who will hear

- a) 2 beats/s with intensity ratio 4/3 between maxima and minima  
 b) 2 beats/s with intensity ratio 49/1 between maxima and minima  
 c) 4 beats/s with intensity ratio 4/3 between maxima and minima  
 d) 4 beats/s with intensity ratio 4/3 between maxima and minima

10. In two similar wires of tension 16 N and  $T$ , 3 beats are heard, then  $T =$

- a) 49 N                      b) 25 N                      c) 64 N                      d) None of these

11. An observer is moving towards the stationary source of sound, then

- a) Apparent frequency will be less than the real frequency  
 b) Apparent frequency will be greater than the real frequency  
 c) Apparent frequency will be equal to real frequency  
 d) Only the quality of sound will change

12. The disc of a siren containing 60 holes rotates at a constant speed of 360 rpm. The emitted sound is in unison with a tuning fork of frequency

- a) 10 Hz                      b) 360 Hz                      c) 216 Hz                      d) 60 Hz

13. Consider the three waves,  $z_1$ ,  $z_2$  and  $z_3$  as

$$z_1 = A \sin(kx - \omega t)$$

$$z_2 = A \sin(kx + \omega t)$$

$$z_3 = A \sin(kx - \omega t)$$

Which of the following represent a standing wave?

- a)  $z_1 + z_2$                       b)  $z_2 + z_3$                       c)  $z_3 + z_1$                       d)  $z_1 + z_2 + z_3$

14. The apparent frequency of the whistle of an engine changes in the ratio 9:8 as the engine passes a stationary observer. If the velocity of the sound is  $340 \text{ ms}^{-1}$ , then the velocity of the engine is

- a)  $40 \text{ ms}^{-1}$                       b)  $20 \text{ ms}^{-1}$                       c)  $340 \text{ ms}^{-1}$                       d)  $180 \text{ ms}^{-1}$

15. Equation of a progressive wave is given by

$$y = 4 \sin \left\{ \pi \left( \frac{t}{5} - \frac{x}{9} \right) + \frac{\pi}{6} \right\}$$

Then which of the following is correct

- a)  $v = 5 \text{ m/sec}$                       b)  $\lambda = 18 \text{ m}$                       c)  $a = 0.04 \text{ m}$                       d)  $n = 50 \text{ Hz}$

16. An underwater sonar source operating at a frequency of  $60\text{ kHz}$  directs its beam towards the surface. If the velocity of sound in air is  $330\text{ m/s}$ , the wavelength and frequency of waves in air are:
- a)  $5.5\text{ mm}, 60\text{ kHz}$       b)  $330\text{ m}, 60\text{ kHz}$       c)  $5.5\text{ mm}, 20\text{ kHz}$       d)  $5.5\text{ mm}, 80\text{ kHz}$
17. Frequency range of the audible sounds is
- a)  $0\text{ Hz} - 30\text{ Hz}$       b)  $20\text{ Hz} - 20\text{ kHz}$       c)  $20\text{ kHz} - 20,000\text{ kHz}$       d)  $20\text{ kHz} - 20\text{ MHz}$
18. If at same temperature and pressure, the densities for two diatomic gases are respectively  $d_1$  and  $d_2$ , then the ratio of velocities of sound in these gases will be
- a)  $\sqrt{\frac{d_2}{d_1}}$       b)  $\sqrt{\frac{d_1}{d_2}}$       c)  $d_1 d_2$       d)  $\sqrt{d_1 d_2}$
19. A man fires a bullet standing between two cliffs. First echo is heard after 3 seconds and second echo is heard after 5 seconds. If the velocity of sound is  $330\text{ m/s}$ , then the distance between the cliffs is
- a)  $1650\text{ m}$       b)  $1320\text{ m}$       c)  $990\text{ m}$       d)  $660\text{ m}$
20. Unlike a laboratory sonometer, a stringed instrument is seldom plucked in the middle. Supposing a sitar string is plucked at about  $\frac{1}{4}$ th of its length from the end. The most prominent harmonic would be
- a) Eighth      b) Fourth      c) Third      d) Second