DPP
DAILY PRACTICE PROBLEMS

CLASS : XITH	SUBJECT : PHYSICS
DATE :	DPP NO. :1

Topic :- WAVES

1. 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) $\frac{1}{10}\sqrt{7}\ cm$

2. Sound waves of wavelength greater than that of audible sound are called

   a) Seismic waves   b) Sonic waves   c) Ultrasonic waves   d) Infrasonic waves

3. 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 $335\ ms^{-1}$, the number of beats heard per second by a passenger inside the buss will be

   a) 3   b) 4   c) 5   d) 6

4. 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) 60 π cm/s   d) 30π cm/s

5. 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) $10\ Hz$

6. 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 $\frac{v}{2L}$

7. Energy is not carried by which of the following waves

   a) Stationary   b) Progressive   c) Transverse   d) Electromagnetic

8. 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 (ωt - kx) and y= a cos (ωt-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 o the pan. What mass should be placed on the pa 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 $0.2\ V$ 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