AIPMT 2006

1. Which one of the following statements is true:-
(1) Both light and sound waves in air are transverse
(2) The sound waves in air are longitudinal while the light waves are transverse
(3) Both light and sound waves in air are longitudinal
(4) Both light and sound waves can travel in vacuum

AIPMT 2009

2. The driver of a car travelling with speed 30 m/sec towards a hill, sounds a horn of frequency 600 Hz. If the velocity of sound in air is 330 m/s, the frequency of reflected sound as heard by driver is
(1) 500 Hz (2) 550 Hz
(3) 555.5 Hz (4) 720 Hz

3. A wave in a string has an amplitude of 2cm. The wave travels in the + ve direction of x axis with a speed of 128 m/sec and it is noted that 5 complete waves fit in 4 m length of the string. The equation describing the wave is :-
(1) $y = (0.02)\ m \sin (7.85x - 1005t)$
(2) $y = (0.02)\ m \sin (7.85x + 1005t)$
(3) $y = (0.02)\ m \sin (15.7x - 2010t)$
(4) $y = (0.02) m \sin (15.7x + 2010t)$

AIPMT (Pre) 2010

4. A transverse wave is represented by $y = A \sin (\omega t - kx)$. For what value of the wavelength is the wave velocity equal to the maximum particle velocity ?

(1) A (2) $\frac{\pi A}{2}$
(3) πA (4) $2\pi A$

5. A tuning fork of frequency 512 Hz makes 4 beats per second with the vibrating string of a piano. The beat frequency decreases to 2 beats per seconds when the tension in the piano string is slightly increased. The frequency of the piano string before increasing the tension was :

(1) 508 Hz (2) 510 Hz
(3) 514 Hz (4) 516 Hz

AIPMT (Pre) 2011

6. Two waves are represented by the equations $y_1 = a\sin (\omega t + kx + 0.57)$ m and $y_2 = a \cos (\omega t + kx)$ m where x is in meter and t in sec. The phase difference between them is :-
(1) 1.0 radian
(2) 1.25 radian
(3) 1.57 radian
(4) 0.57 radian

7. Sound waves travel at 350 m/s through a warm air and at 3500 m/s through brass. The wavelength of a 700 Hz acoustic wave as it enters brass from warm air :
(1) decreases by a factor 10
(2) increases by a factor 20
(3) increases by a factor 10
(4) decreases by a factor 20

AIPMT (Mains) 2011

8. Two identical piano wires, kept under the same tension T have a fundamental frequency of 600 Hz. The fractional increase in the tension of one of the wires which will lead to occurrence of 6 beats/s when both the wires oscillate together would be :-
(1) 0.01 (2) 0.02
(3) 0.03 (4) 0.04

AIPMT (Pre) 2012

9. Two sources of sound placed close to each other, are emitting progressive waves given by
$y_1 = 4 \sin 600\pi t$ and $y_2 = 5 \sin 608\pi t$
An observer located near these two sources will hear :-
(1) 8 beats per second with intensity ratio 81 : 1 between waxing and waning
(2) 4 beats per second with intensity ratio 81 : 1 between waxing and waning
(3) 4 beats per second with intensity ratio 25 : 16 between waxing and waning
(4) 8 beats per second with intensity ratio 25 : 16 between waxing and waning

AIPMT (Mains) 2012

10. The equation of a simple harmonic wave is given by :

$y = 3 \sin \frac{\pi}{2}(50\ t - x)$,

where x and y are in metres and t is in seconds. The ratio of maximum particle velocity to the wave velocity is :-

(1) 3π (2) $\frac{2}{3}\pi$

(3) 2π (4) $\frac{3}{2}\pi$

NEET-UG 2013

11. A wave travelling in the +ve x-direction having displacement along y-direction as 1m, wavelength 2π m and frequency of $\frac{1}{\pi}$ Hz is represented by :

(1) $y = \sin(2\pi x + 2\pi t)$

(2) $y = \sin(x - 2t)$

(3) $y = \sin(2\pi x - 2\pi t)$

(4) $y = \sin(10\pi x - 20\pi t)$

12. A source of unknown frequency gives 4 beats/s, when sounded with a source of known frequency 250 Hz. The second harmonic of the source of unknown frequency gives five beats per second, when sounded with a source of frequency 513 Hz. The unknown frequency is

(1) 260 Hz (2) 254 Hz

(3) 246 Hz (4) 240 Hz

13. If we study the vibration of a pipe open at both ends, then the following statement is not true :

(1) Pressure change will be maximum at both ends

(2) Open end will be antinode

(3) Odd harmonics of the fundamental frequency will be generated

(4) All harmonics of the fundamental frequency will be generated

AIPMT 2014

14. If n_1, n_2 and n_3 are the fundamental frequencies of three segments into which a string is divided, then the original fundamental frequency n of the string is given by :-

(1) $\frac{1}{n} = \frac{1}{n_1} + \frac{1}{n_2} + \frac{1}{n_3}$

(2) $\frac{1}{\sqrt{n}} = \frac{1}{\sqrt{n_1}} + \frac{1}{\sqrt{n_2}} + \frac{1}{\sqrt{n_3}}$

(3) $\sqrt{n} = \sqrt{n_1} + \sqrt{n_2} + \sqrt{n_3}$

(4) $n = n_1 + n_2 + n_3$

15. The number of possible natural oscillations of air column in a pipe closed at one end of length 85 cm whose frequencies lie below 1250 Hz are: (velocity of sound = 340 ms^{-1})

(1) 4 (2) 5

(3) 7 (4) 6

AIPMT 2015

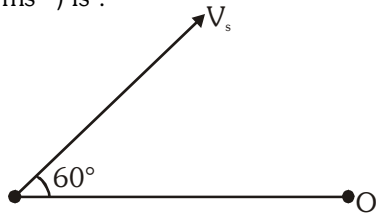
16. The fundamental frequency of a closed organ pipe of length 20 cm is equal to the second overtone of an organ pipe open at both the ends. The length of organ pipe open at both the ends is :-

(1) 100 cm (2) 120 cm

(3) 140 cm (4) 80 cm

RE-AIPMT-2015

17. A source of sound S emitting waves of frequency 100 Hz and an observer O are located at some distance from each other. The source is moving with a speed of 19.4 ms^{-1} at an angle of 60° with the source observer line as shown in the figure. The observer is at rest. The apparent frequency observed by the observer (velocity of sound in air 330 ms^{-1}) is :-



(1) 97 Hz (2) 100 Hz

(3) 103 Hz (4) 106 Hz

18. A string is stretched between two fixed points separated by 75.0 cm. It is observed to have resonant frequencies of 420 Hz and 315 Hz. There are no other resonant frequencies between these two. The lowest resonant frequencies for this string is :-

(1) 105 Hz (2) 155 Hz
(3) 205 Hz (4) 10.5 Hz

NEET-I 2016

19. A siren emitting a sound of frequency 800 Hz moves away from an observer towards a cliff at a speed of $15 ms^{-1}$. Then, the frequency of sound that the observer hears in the echo reflected from the cliff is :

(Take velocity of sound in air = $330 ms^{-1}$)

(1) 765 Hz (2) 800 Hz
(3) 838 Hz (4) 885 Hz

20. A uniform rope of length L and mass m_1 hangs vertically from a rigid support. A block of mass m_2 is attached to the free end of the rope. A transverse pulse of wavelength λ_1 is produced at the lower end of the rope. The wavelength of the pulse when it reaches the top of the rope is λ_2. The ratio λ_2/λ_1 is :

(1) $\sqrt{\frac{m_1}{m_2}}$ (2) $\sqrt{\frac{m_1+m_2}{m_2}}$

(3) $\sqrt{\frac{m_2}{m_1}}$ (4) $\sqrt{\frac{m_1+m_2}{m_1}}$

21. An air column, closed at one end and open at the other, resonates with a tuning fork when the smallest length of the column is 50 cm. The next larger length of the column resonating with the same tuning fork is :

(1) 66.7 cm (2) 100 cm (3) 150 cm (4) 200 cm

NEET-II 2016

22. The second overtone of an open organ pipe has the same frequency as the first overtone of a closed pipe L metre long. The length of the open pipe will be

(1) $\frac{L}{2}$ (2) 4 L (3) L (4) 2 L

23. Three sound waves of equal amplitudes have frequencies (n – 1), n, (n + 1). They superimpose to give beats. The number of beats produced per second will be :-

(1) 3 (2) 2 (3) 1 (4) 4

NEET(UG) 2017

24. The two nearest harmonics of a tube closed at one end and open at other end are 220 Hz and 260 Hz. What is the fundamental frequency of the system?

(1) 20 Hz (2) 30 Hz
(3) 40 Hz (4) 10 Hz

25. Two cars moving in opposite directions approach each other with speed of 22 m/s and 16.5 m/s respectively. The driver of the first car blows a horn having a frequency 400 Hz. The frequency heard by the driver of the second car is [velocity of sound 340 m/s] :-

(1) 361 Hz (2) 411 Hz
(3) 448 Hz (4) 350 Hz

NEET(UG) 2018

26. A tuning fork is used to produce resonance in a glass tube. The length of the air column in this tube can be adjusted by a variable piston. At room temperature of 27°C two successiv resonances are produced at 20 cm and 73 cm column length. If the frequency of the tuning fork is 320 Hz, the velocity of sound in air at 27°C is :-

(1) 330 m/s
(2) 339 m/s
(3) 350 m/s
(4) 300 m/s

27. The fundamental frequency in an open organ pipe is equal to the third harmonic of a closed organ pipe. If the length of the closed organ pipe is 20 cm, the length of the open organ pipe is :-

(1) 13.2 cm
(2) 8 cm
(3) 12.5 cm
(4) 16 cm

NEET(UG) 2019 (Odisha)

28. A tuning fork with frequency 800 Hz produces resonance in a resonance column tube with upper end open and lower end closed by water surface. Successive resonance are observed at length 9.75 cm, 31.25 cm and 52.75 cm. The speed of sound in air is :-

(1) 500 m/s (2) 156 m/s

(3) 344 m/s (4) 172 m/s

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	**2**	**4**	**1**	**4**	**1**	**1**	**3**	**2**	**2**	**4**	**2**	**2**	**1**	**1**	**4**
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28		
Ans.	**2**	**3**	**1**	**3**	**2**	**3**	**4**	**2**	**1**	**3**	**2**	**1**	**3**		