Waves

Question 1.
Which of the following expressions is that of a simple harmonic progressive wave
(a) a sin wt
(b) a sin (wt) cos (kx)
(c) a sin (wt – kx)
(d) a cos kx

▼ Answer

Answer: (c) a sin (wt – kx)

Question 2.
Energy is not carried by
(a) Longitudinal progressive waves
(b) Electromagnetic waves
(c) Transverse progressive waves
(d) Stationary wave

▼ Answer

Answer: (d) Stationary wave

Question 3.
In stationary waves
(a) Energy is uniformly distributed
(b) Energy is minimum at nodes and maximum at antinodes
(c) Energy is maximum at nodes and minimum at antinodes
(d) None of these

▼ Answer

Answer: (b) Energy is minimum at nodes and maximum at antinodes

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Question 4.
Two tuning forks of frequencies 256 and 258 vibrations/second are sounded together. Then the time interval between two consecutive maxima heard by an observer is
(a) 2 sec
(b) 0.5 sec
(c) 250 sec
(d) 252 sec

▼ Answer

Answer: (b) 0.5 sec

Question 5.
Which one of the following cannot represent a traveling wave
(a) $y = f(x - nt)$
(b) $y = y_m \sin k(x + nt)$
(c) $y = y_m \log(x - nt)$
(d) $y = f(x^2 - nt^2)$

▼ Answer

Answer: (c) y = ym log (x – nt)

Question 6.
The wavelength of sound in air is 10 cm. its frequency is, (Given velocity of sound = 330 m/s)
(a) 330 cycles per second
(b) 3.3 kilo cycles per second
(c) 30 mega-cycles per second
(d) 305 cycles per second

▼ Answer

Answer: (b) 3.3 kilo cycles per second

Question 7.
An observer moves towards a stationary source of sound with a velocity one-fifth of the velocity of sound. What is the percentage increase in the apparent freq ency?
(a) 0.50%
(b) zero
(c) 20%
(d) 5%

▼ Answer

Answer: (c) 20%

Question 8.
In the longitudinal waves the direction of vibration in medium of particle is
(a) Perpendicular to propagation of wave
(b) Parallel to propagation
(c) Different from each other
(d) Variable for time to time

▼ Answer

Answer: (b) Parallel to propagation

Question 9.
Two identical straight wires are stretched so as to produce 6 beats per second when tension slightly in one of them, the beat frequency remains unchanged. Denoting by T1 and T2 the higher and lower initial tension in the strings, then it could be said that while making the above changes in tension
(a) T2 was decreased
(b) T2 was increased
(c) T1 was decreased
(d) Both (b) and (c)

▼ Answer

Answer: (d) Both (b) and (c)

Question 10.
Two closed pipe produces 10 beats per second when emitting their fundamental nodes. If their lengths are in the ratio of 25 : 26 their fundamental frequency in Hz are
(a) 270, 280
(b) 260, 270

(c) 260, 250
(d) 240, 250

▼ Answer

Answer: (c) 260, 250

Question 11.
A sonometer wire resonates with a given tuning fork forming standing waves with five antinodes between the two bridges when a mass of 9 kg is suspended from the wire. When this mass is replaced by mass M, the wire resonates with the same tuning fork forming three antinodes for the same positions of the bridges. The value of M is
(a) 25 kg
(b) 5 kg
(c) 12.5 kg
(d) 1 / 25 kg

▼ Answer

Answer: (a) 25 kg

Question 12.
Four wires of identical lengths, diameters and material and stretched on a sonometer box. The ratio of their tension is 1 : 4 : 9 : 16. the ratio of their fundamental frequencies is
(a) 1 : 6 : 9 : 16
(b) 4 : 3 : 2 : 1
(c) 1 : 2 : 3 : 4
(d) 1 : 4 : 9 : 16

▼ Answer

Answer: (c) 1 : 2 : 3 : 4

Question 13.
When two tuning forks (fork 1 and fork 2) are sounded simultaneously, 4 beats per second are heard. Now, some tape is attached on the prong of fork 2. When the tuning forks are sounded again, 6 beats per second are heard . If the frequency of fork 1 is 200 Hz, then what was the original freqency of fork 2?
(a) 202 Hz
(b) 200 Hz
(c) 204 Hz
(d) 196 Hz

▼ Answer

Answer: (d) 196 Hz

Question 14.
A tuning fork of frequency 480 Hz is in unison with pipe closed at one end vibrating in its first overtone. Then fundamental frequency of the pipe is
(a) 150 Hz
(b) 160 Hz
(c) 480 Hz
(d) 190 Hz

▼ Answer

Answer: (c) 480 Hz

Question 15.
The velocity of sound is maximum in
(a) Water
(b) Air
(c) Vacuum
(d) Metal

▼ Answer

Answer: (d) Metal

Question 16.
The velocity of sound in any gas depends upon
(a) Wavelength of sound only
(b) Density and elasticity of ga
(c) Intensity of sound waves only
(d) Amplitude and frequency of sound

▼ Answer

Answer: (b) Density and elasticity of ga

Question 17.
Two sounding bodies producing progressive wave given by y1 = 4 sin 400 pt and y2 = 4 sin 404 pt are situated very near to the ears of a person who will hear
(a) 2 beats per second with intensity ratio (4/3) between maxima and minima
(b) 2 beats per second with intensity ratio (49/1) between maxima and minima
(c) 4 beats per second with intensity ratio (7/1) between maxima and minima
(d) 4 beats per second with intensity ratio (4/3) between maxima and minima

▼ Answer

Answer: (b) 2 beats per second with intensity ratio (49/1) between maxima and minima

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Question 18.
In stationary waves
(a) Energy is uniformly distributed
(b) Energy is minimum at nodes and maximum at antinodes
(c) Energy is maximum at nodes and minimum at antinodes
(d) None of these

▼ Answer

Answer: (b) Energy is minimum at nodes and maximum at antinodes

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Question 19.
A pipe closed at one end vibrating in 5th overtone is in unison with open pipe vibrating in its 5th overtone. The ratio of lc : lo is.
(a) 12 : 11
(b) 1 : 1
(c) 11 : 12
(d) 5 : 1

▼ Answer

Answer: (c) 11 : 12

Question 20.
The equation of wave traveling along string is y = 3 cos p (100t – x) in C.G.S. unit then wavelength is
(a) 1 m
(b) 2 cm
(c) 5 cm
(d) None of above

▼ Answer

Answer: (b) 2 cm
