

WAVE MOTION

1. Water waves are of the nature :

A Transverse

B Longitudinal

C Sometimes longitudinal and some times transverse and longitudinal both

D Neither transverse nor longitudinal

USE CODE **PHEEL** FOR PLUS

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2. Sound wave are not polarized because :

- A Their speed is less
- B A medium is needed for their propagation
- C These are longitudinal
- D Their speed depends on temperature

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3. A thunder tap is heard 5.5 second after the lightening flash. The distance of the flash is (velocity of sound in air is 330 m/sec.) :-

A

3560 m

B

300 m

C

1780 m

D

1815 m

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3560 m

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4. Transverse waves can propagate

A only in solids

B both in solids and gases

C neither in solids nor in gases

D only in gases

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5. Transverse elastic waves can be propagate in

A Both solid & gas

B In solid but not gas

C Neither solid nor gas

D None

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B In solid but not gas

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6. A wave of frequency 500 Hz travels between X and Y and travel a distance of 600 m in 2 sec. between X and Y. How many wavelength are there in distance XY :

A

1000

B

300

C

180

D

2000

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6. A wave of frequency 500 Hz travels between X and Y and travel a distance of 600 m in 2 sec. between X and Y. How many wavelength are there in distance XY :

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B

300

C

180

D

2000

USE CODE **PHEEL** FOR PLUS

7. If at a place the speed of a sound wave of frequency 300 Hz is V , the speed of another wave of frequency 150 Hz at the same place will be:

A

V

B

$V/2$

C

$2V$

D

$4V$

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$4V$

USE CODE **PHEEL** FOR PLUS

8. The equation of a progressive wave for a wire is:

$$Y = 4 \sin \left[\frac{\pi}{2} \left(8t - \frac{x}{8} \right) \right].$$

If x and y are measured

in cm then velocity of wave is :

A 64 cm/s along $-x$ direction

B 32 cm/s along $-x$ direction

C 32 cm/s along $+x$ direction

D 64 cm/s along $+x$ direction

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9. The equation of progressive wave is

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

in cm. Which of the following statement is true ?

A $\lambda = 18 \text{ cm}$

B amplitude = 0.04 cm

C velocity $v = 50 \text{ cm/s}$

D frequency $f = 20 \text{ Hz}$

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D frequency $f = 20 \text{ Hz}$

USE CODE **PHEEL** FOR PLUS

10. A plane progressive wave is represented by the equation $y = 0.25 \cos (2\pi t - 2\pi x)$.

The equation of a wave is with double the amplitude and half frequency but travelling in the opposite direction will be.

A $y = 0.5 \cos (\pi t - \pi x)$

B $y = 0.5 \cos (2\pi t + 2\pi x)$

C $y = 0.25 \cos (\pi t + 2\pi x)$

D $y = 0.5 \cos (\pi t + \pi x)$

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D $y = 0.5 \cos (\pi t + \pi x)$

USE CODE **PHEEL** FOR PLUS

11. A plane wave is described by the equation

$$y = 3 \cos\left(\frac{x}{4} - 10t - \frac{\pi}{2}\right).$$

The maximum velocity of the particles of the medium due to this wave is

A

30

B

$\frac{3\pi}{2}$

C

$3/4$

D

40

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USE CODE **PHEEL** FOR PLUS

12. The equation $y = 4 + 2 \sin (6t - 3x)$ represents a wave motion with

A amplitude 6 units

B amplitude 4 units

C wave speed 2 units

D wave speed $1/2$ units

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13. The equation of a progressive wave are

$$Y = \sin \left[200\pi \left(t - \frac{x}{330} \right) \right], \text{ where } x \text{ is in meter and}$$

t is in second. The frequency and velocity of wave are

A 100 Hz, 5 m/s

B 300 Hz, 100 m/s

C 100 Hz, 330 m/s

D 30 m/s, 5 Hz

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USE CODE **PHEEL** FOR PLUS

14. Due to propagation of longitudinal wave in a medium, the following quantities also propagate in the same direction :

A Energy, Momentum and Mass

B Energy

C Energy and Mass

D Energy and Linear Momentum

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15. The waves in which the particles of the medium vibrate in a direction perpendicular to the direction of wave motion is known as :

A transverse waves

B propagated waves

C longitudinal waves

D stationary waves

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16. Two wave are represented by equation

$$y_1 = a \sin \omega t \quad y_2 = a \cos \omega t$$

the first wave –

A leads the second by π

B lags the second by π

C leads the second by $\frac{\pi}{2}$

D lags the second by $\frac{\pi}{2}$

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17. The distance between two consecutive crests in a wave train produced in string is 5 m. If two complete waves pass through any point per second, the velocity of wave is

A

2.5 m/s

B

5 m/s

C

10 m/s

D

15 m/s

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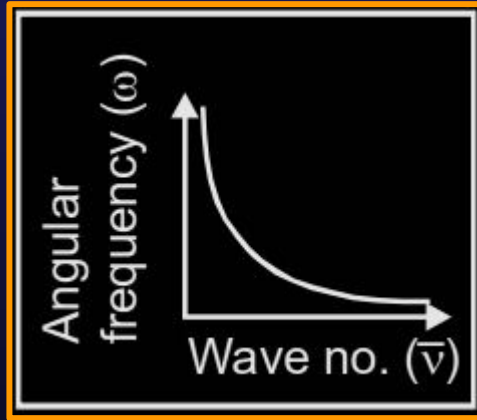
D

15 m/s

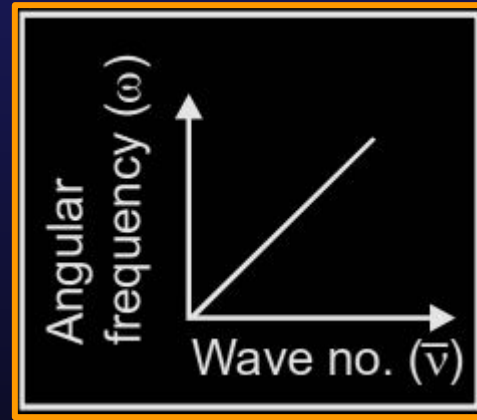
USE CODE **PHEEL** FOR PLUS

18. The graph between wave number ($\bar{\nu}$) and angular frequency (ω) is :

A

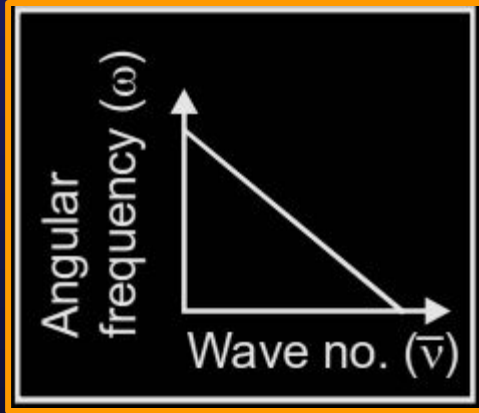


B

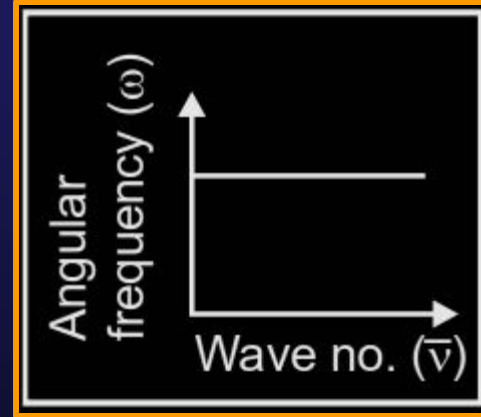


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C



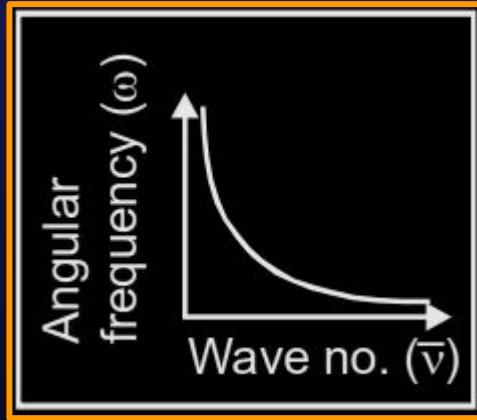
D



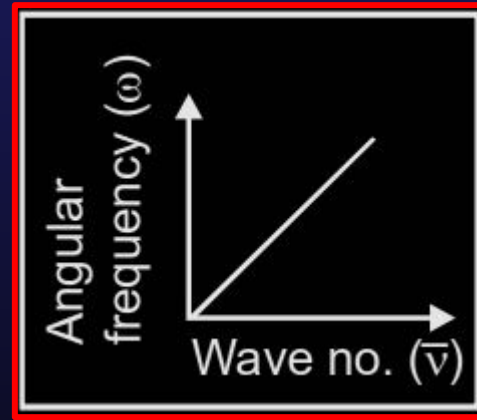
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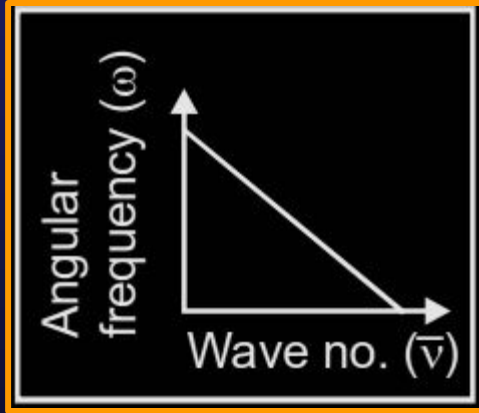


B

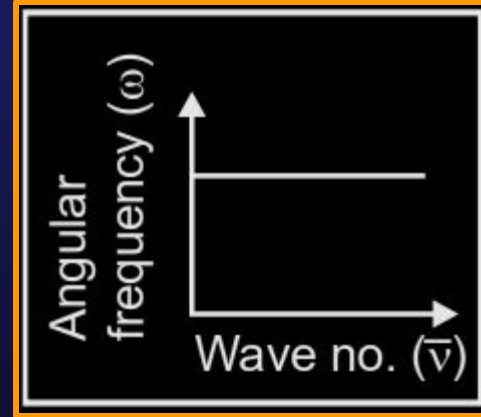


USE CODE **PHEEL** FOR PLUS

C



D



USE CODE **PHEEL** FOR PLUS

19. The waves produced by a motorboat sailing on water are

A Transverse

B Longitudinal

C Longitudinal and Transverse

D Stationary

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20. In a string the speed of wave is 10 m/s and its frequency is 100 Hz . The value of the phase difference at a distance 2.5 cm will be :

A

$$\pi/2$$

B

$$\pi/8$$

C

$$3\pi/2$$

D

$$2\pi$$

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$$3\pi/2$$

D

$$2\pi$$

USE CODE **PHEEL** FOR PLUS

21. A uniform rope of mass 0.1 kg and length 2.5 m hangs from ceiling. The speed of transverse wave in the rope at upper end and at a point 0.5 m distance from lower end will be :

A 5 m/s, 2.24 m/s

B 10 m/s, 3.23 m/s

C 7.5 m/s, 1.2 m/s

D 2.25 m/s, 5 m/s

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B 10 m/s, 3.23 m/s

C 7.5 m/s, 1.2 m/s

D 2.25 m/s, 5 m/s

USE CODE **PHEEL** FOR PLUS

22. The equation of a wave on a string of linear density 0.04 kg m^{-1} is given by

$$y = 0.02(\text{m}) \sin \left[2\pi \left(\frac{t}{0.04(\text{s})} - \frac{x}{0.50(\text{m})} \right) \right].$$

The tension in the string is :

A

6.25 N

B

4.0 N

C

12.5 N

D

0.5 N

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A

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23. The mathematical forms for three sinusoidal travelling waves are given by

$$\text{Wave 1 : } y(x,t) = (2\text{cm}) \sin(3x-6t)$$

$$\text{Wave 2 : } y(x,t) = (3\text{cm}) \sin(4x-12t)$$

$$\text{Wave 3 : } y(x,t) = (4\text{cm}) \sin(5x-11t)$$

where x is in meters and t is in seconds. Of these waves :

A wave 1 has the greatest wave speed and the greatest maximum transverse string speed.

B wave 2 has the greatest wave speed and wave 1 has the greatest maximum transverse string speed.

C wave 3 has the greatest wave speed and the greatest maximum transverse string speed.

D wave 2 has the greatest wave speed and wave 3 has the greatest maximum transverse string speed.

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A wave 1 has the greatest wave speed and the greatest maximum transverse string speed.

B wave 2 has the greatest wave speed and wave 1 has the greatest maximum transverse string speed.

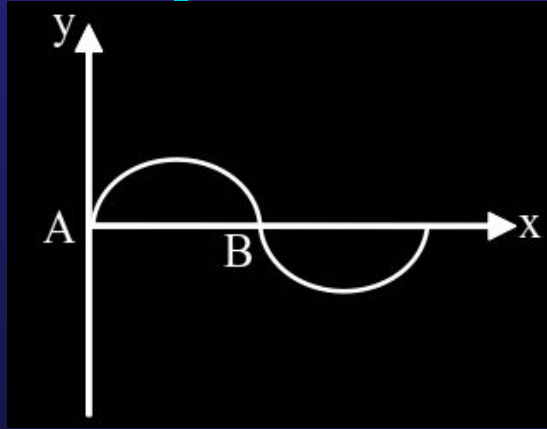
C wave 3 has the greatest wave speed and the greatest maximum transverse string speed.

D wave 2 has the greatest wave speed and wave 3 has the greatest maximum transverse string speed.

USE CODE **PHEEL** FOR PLUS

24. The figure shows an instantaneous profile of a rope carrying a progressive wave moving from left to right, then

- (a) the phase at A is greater than the phase at B
- (b) the phase at B is greater than the phase at A
- (c) A is moving upwards
- (d) B is moving upwards



A

a & c

B

a & d

C

b & c

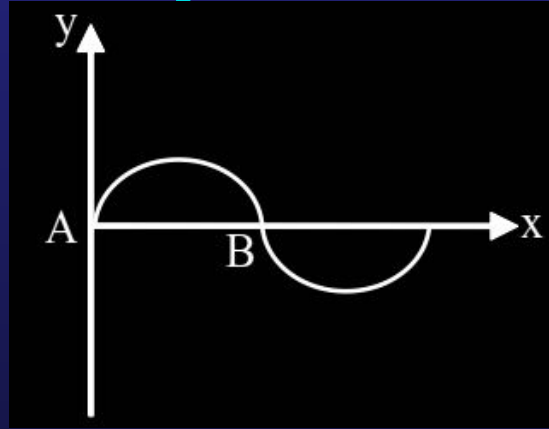
D

b & d

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A

a & c

B

a & d

C

b & c

D

b & d

USE CODE **PHEEL** FOR PLUS

25. Linear density of a string is 1.3×10^{-4} kg/m and wave equation is $y = 0.021 \sin(x + 30t)$. Find the tension in the string where x in meter, t in sec.

A

$$1.17 \times 10^{-2} \text{ N}$$

B

$$1.17 \times 10^{-1} \text{ N}$$

C

$$1.17 \times 10^{-3} \text{ N}$$

D

None

USE CODE **PHEEL** FOR PLUS

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A

$$1.17 \times 10^{-2} \text{ N}$$

B

$$1.17 \times 10^{-1} \text{ N}$$

C

$$1.17 \times 10^{-3} \text{ N}$$

D

None

USE CODE **PHEEL** FOR PLUS

26. The speed of sound in air at constant temperature

- A is proportional to the atmospheric pressure.
- B is proportional to the square of atmospheric pressure.
- C is proportional to the square root of atmospheric pressure
- D does not depend on atmospheric pressure.

USE CODE **PHEEL** FOR PLUS

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USE CODE **PHEEL** FOR PLUS

27. At the room temperature the velocity of sound in O_2 gas is V . Then in mixture of H_2 and O_2 gas the speed of sound at same temperature:

A will be less than V .

B will be more than V

C will be equal to V

D nothing can be said

USE CODE **PHEEL** FOR PLUS

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28. The velocity of sound in a gas depends

- A only on its wave length
- B on the density and the elasticity of gas
- C on intensity of the sound
- D on the amplitude and the frequency.

USE CODE **PHEEL** FOR PLUS

28. The velocity of sound in a gas depends

- A only on its wave length
- B on the density and the elasticity of gas
- C on intensity of the sound
- D on the amplitude and the frequency.

USE CODE **PHEEL** FOR PLUS

29. If at some point the amplitude of the sound becomes double and the frequency becomes one fourth then at that point the intensity of sound will be :-

A

Become double

B

Be half

C

Become one fourth

D

Remain unchanged

USE CODE **PHEEL** FOR PLUS

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B Be half

C Become one fourth

D Remain unchanged

USE CODE **PHEEL** FOR PLUS

30. A sound is produced in water and moves towards surface of water and some sound moves in air velocity of sound in water is 1450 m/s and that in air is 330 m/s. When sound moves from water to air then the effect on frequency f and wave length λ will be:

USE CODE PHEEL FOR PLUS

A

f and λ will remain same

B

f will remain same but λ will increase

C

f will remain same but λ will decrease

D

f will increase and λ will decrease

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C

f will remain same but λ will decrease

D

f will increase and λ will decrease

USE CODE **PHEEL** FOR PLUS

31. When sound wave travels from air to water, which are of the following remain constant :

A

wavelength

B

velocity

C

frequency

D

intensity

USE CODE **PHEEL** FOR PLUS

31. When sound wave travels from air to water, which are of the following remain constant :

A

wavelength

B

velocity

C

frequency

D

intensity

USE CODE **PHEEL** FOR PLUS

32. Newton's formula for the velocity of sound in gases is :

A

$$v = \sqrt{\frac{2p}{\rho}}$$

B

$$v = \sqrt{\frac{p}{\rho}}$$

C

$$v = \sqrt{\frac{\rho}{p}}$$

D

$$v = \frac{3}{2} \sqrt{\frac{p}{\rho}}$$

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A

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B

$$v = \sqrt{\frac{p}{\rho}}$$

C

$$v = \sqrt{\frac{\rho}{p}}$$

D

$$v = \frac{3}{2} \sqrt{\frac{p}{\rho}}$$

USE CODE **PHEEL** FOR PLUS

33. Intensity level of a sound of intensity I is 30 dB. The ratio I/I_0 is
(I_0 is the threshold of hearing)

A

1000

B

3000

C

300

D

30

USE CODE **PHEEL** FOR PLUS

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(I_0 is the threshold of hearing)

A

1000

B

3000

C

300

D

30

USE CODE **PHEEL** FOR PLUS

34. If v_m is the velocity of sound in moist air and v_d is the velocity of sound in dry air then :

A

$$v_m < v_d$$

B

$$v_m > v_d$$

C

$$v_d \gg v_m$$

D

$$v_m = v_d$$

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C

$$v_d \gg v_m$$

D

$$v_m = v_d$$

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35. A sine wave has an amplitude A and wavelength λ . Let V be wave velocity and v be the maximum velocity of a particle in medium then.

A $V = v$ if $A = \frac{\lambda}{2\pi}$

B V can not be equal to v

C $V = v$ if $\lambda = \frac{3A}{2\pi}$

D $V = v$ if $A = 2\pi\lambda$

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A $V = v$ if $A = \frac{\lambda}{2\pi}$

B V can not be equal to v

C $V = v$ if $\lambda = \frac{3A}{2\pi}$

D $V = v$ if $A = 2\pi\lambda$

USE CODE **PHEEL** FOR PLUS

36. A sings with a frequency (n) and B sings with a frequency $1/8$ that of A. If the energy remains the same and the amplitude of A is a , then amplitude of B will be :

A

$$2a$$

B

$$8a$$

C

$$4a$$

D

$$a$$

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D

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37. The velocities of sound at the same pressure in two monoatomic gases of densities ρ_1 and ρ_2 are v_1 and v_2 respectively. If $\frac{\rho_1}{\rho_2} = 4$, then the value of $\frac{v_1}{v_2}$ is :

A

$$\frac{1}{4}$$

B

$$\frac{1}{2}$$

C

$$2$$

D

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A

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B

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C

$$2$$

D

$$4$$

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38. The time period of SHM of a particle is 12 s. The phase difference between the position at $t = 3\text{ s}$ and $t = 4\text{ s}$ will be :

A

$$\pi/4$$

B

$$3\pi/5$$

C

$$\pi/6$$

D

$$\pi/2$$

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38. The time period of SHM of a particle is 12 s. The phase difference between the position at $t = 3\text{ s}$ and $t = 4\text{ s}$ will be :

A

$$\pi/4$$

B

$$3\pi/5$$

C

$$\pi/6$$

D

$$\pi/2$$

USE CODE **PHEEL** FOR PLUS

39. Velocity of sound in medium is V . If the density of the medium is doubled, what will be the new velocity of sound ?

A

$$\sqrt{2}V$$

B

$$V$$

C

$$V/\sqrt{2}$$

D

$$2V$$

USE CODE **PHEEL** FOR PLUS

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A

$$\sqrt{2}V$$

B

$$V$$

C

$$V/\sqrt{2}$$

D

$$2V$$

USE CODE **PHEEL** FOR PLUS

40. A man standing on a cliff claps his hand and hears its echo after one second. If the sound is reflected from another mountain then the distance between the man & reflection points is $V_{\text{sound}} = 340 \text{ m/sec}$.

A

680 m

B

340 m

C

170 m

D

85 m

USE CODE **PHEEL** FOR PLUS

40. A man standing on a cliff claps his hand and hears its echo after one second. If the sound is reflected from another mountain then the distance between the man & reflection points is $V_{\text{sound}} = 340 \text{ m/sec}$.

A

680 m

B

340 m

C

170 m

D

85 m

USE CODE **PHEEL** FOR PLUS

41. At a particle two simple harmonic motion are acting along the same direction. These are $y_1 = a_1 \sin \omega t$ and $y_2 = a_2 \sin (\omega t + \phi)$. The resultant motion is also a simple harmonic motion whose amplitude will be:

A

$$a_1^2 + a_2^2 + 2a_1a_2 \cos \phi$$

B

$$\sqrt{a_1^2 + a_2^2 + 2a_1a_2 \cos \phi}$$

C

$$\sqrt{a_1^2 + a_2^2 - 2a_1a_2 \cos \phi}$$

D

$$a_1^2 + a_2^2 - 2a_1a_2 \cos \phi$$

USE CODE **PHEEL** FOR PLUS

41. At a particle two simple harmonic motion are acting along the same direction. These are $y_1 = a_1 \sin \omega t$ and $y_2 = a_2 \sin (\omega t + \phi)$. The resultant motion is also a simple harmonic motion whose amplitude will be:

A

$$a_1^2 + a_2^2 + 2a_1a_2 \cos \phi$$

B

$$\sqrt{a_1^2 + a_2^2 + 2a_1a_2 \cos \phi}$$

C

$$\sqrt{a_1^2 + a_2^2 - 2a_1a_2 \cos \phi}$$

D

$$a_1^2 + a_2^2 - 2a_1a_2 \cos \phi$$

USE CODE **PHEEL** FOR PLUS

42. The energy in the superposition of waves :

A

Is lost

B

Increase

C

remain same, only redistribution occurs

D

None of the above

USE CODE **PHEEL** FOR PLUS

42. The energy in the superposition of waves :

A

Is lost

B

Increase

C

remain same, only redistribution occurs

D

None of the above

USE CODE **PHEEL** FOR PLUS

43. Waves from two sources superimpose on each other at a particular point. Amplitude and frequency of both the waves are equal. The ratio of intensities when both waves reach in the same phase and they reach with the phase difference of 90° will be

A

1:1

B

$\sqrt{2}:1$

C

2:1

D

4:1

USE CODE **PHEEL** FOR PLUS

43. Waves from two sources superimpose on each other at a particular point. Amplitude and frequency of both the waves are equal. The ratio of intensities when both waves reach in the same phase and they reach with the phase difference of 90° will be

A

1:1

B

$\sqrt{2}:1$

C

2:1

D

4:1

USE CODE **PHEEL** FOR PLUS

44. Two waves whose intensity are same (I) move towards a point P in same phase, then the resultant intensity at point P will be:

A

$4 I$

B

$2 I$

C

$\sqrt{2} I$

D

None

USE CODE **PHEEL** FOR PLUS

44. Two waves whose intensity are same (I) move towards a point P in same phase, then the resultant intensity at point P will be:

A

$4 I$

B

$2 I$

C

$\sqrt{2} I$

D

None

USE CODE **PHEEL** FOR PLUS

45. Ratio of amplitudes of two waves is 3:4. The ratio of maximum and minimum intensity obtained from them will be :

A

7:1

B

49:1

C

1:25

D

5:1

USE CODE **PHEEL** FOR PLUS

45. Ratio of amplitudes of two waves is 3:4. The ratio of maximum and minimum intensity obtained from them will be :

A

7:1

B

49:1

C

1:25

D

5:1

USE CODE **PHEEL** FOR PLUS

46. Two coherent sources of intensities I_1 and I_2 produce an interference pattern, the maximum intensity in the interference pattern will be –

A

$$I_1 + I_2$$

B

$$I_1^2 + I_2^2$$

C

$$(I_1 + I_2)^2$$

D

$$(\sqrt{I_1} + \sqrt{I_2})^2$$

USE CODE **PHEEL** FOR PLUS

46. Two coherent sources of intensities I_1 and I_2 produce an interference pattern, the maximum intensity in the interference pattern will be –

A

$$I_1 + I_2$$

B

$$I_1^2 + I_2^2$$

C

$$(I_1 + I_2)^2$$

D

$$(\sqrt{I_1} + \sqrt{I_2})^2$$

USE CODE **PHEEL** FOR PLUS

47. Intensities ratio of two waves are 9:1 then the ratio of their maximum and minimum intensities will be:-

A

10 : 8

B

7 : 2

C

4 : 1

D

2 : 1

USE CODE **PHEEL** FOR PLUS

47. Intensities ratio of two waves are 9:1 then the ratio of their maximum and minimum intensities will be:-

A

10 : 8

B

7 : 2

C

4 : 1

D

2 : 1

USE CODE **PHEEL** FOR PLUS

48. When two tuning forks are sounded together x beats/sec are heard and frequency of A is n . Now when one prong of B is loaded with a little wax, the number of beats per second decreases. The frequency of fork B is :

A

$$n + x$$

B

$$n - x$$

C

$$n - x^2$$

D

$$n - 2x$$

USE CODE **PHEEL** FOR PLUS

48. When two tuning forks are sounded together x beats/sec are heard and frequency of A is n . Now when one prong of B is loaded with a little wax, the number of beats per second decreases. The frequency of fork B is :

A

$$n + x$$

B

$$n - x$$

C

$$n - x^2$$

D

$$n - 2x$$

USE CODE **PHEEL** FOR PLUS

49. A source x of unknown frequency produces 8 beats with a source of 250 Hz and 12 beats with a source of 270 Hz. The frequency of source x is :

A

258 Hz

B

242 Hz

C

262 Hz

D

282 Hz

USE CODE **PHEEL** FOR PLUS

49. A source x of unknown frequency produces 8 beats with a source of 250 Hz and 12 beats with a source of 270 Hz. The frequency of source x is :

A

258 Hz

B

242 Hz

C

262 Hz

D

282 Hz

USE CODE **PHEEL** FOR PLUS

50. Two waves of wave length 2 m and 2.02 m respectively moving with the same velocity and superimpose to produce 2 beats per sec. The velocity of the waves is:

A

400.0 m/s

B

402 m/s

C

404 m/s

D

406 m/s

USE CODE **PHEEL** FOR PLUS

50. Two waves of wave length 2 m and 2.02 m respectively moving with the same velocity and superimpose to produce 2 beats per sec. The velocity of the waves is:

A

400.0 m/s

B

402 m/s

C

404 m/s

D

406 m/s

USE CODE **PHEEL** FOR PLUS

51. A tuning fork produces 4 beats/sec. with another tuning fork B of frequency 288 Hz. If fork is loaded with little wax no. of beats per sec decreases. The frequency of the fork A, before loading is

A

290 Hz

B

288 Hz

C

292 Hz

D

284 Hz

USE CODE **PHEEL** FOR PLUS

51. A tuning fork produces 4 beats/sec. with another tuning fork B of frequency 288 Hz. If fork is loaded with little wax no. of beats per sec decreases. The frequency of the fork A, before loading is

A

290 Hz

B

288 Hz

C

292 Hz

D

284 Hz

USE CODE **PHEEL** FOR PLUS

52.

Column I		Column II	
A	Longitudinal waves	P	Particles of the medium vibrate perpendicular to the wave propagation.
B	Transverse waves	Q	Two progressive waves of slightly different frequencies superimpose in the same direction
C	Beats	R	Two progressive waves of same frequency superimpose in the opposite directions
D	Stationary waves	S	Particles of the medium vibrate along the wave propagation.

USE CODE PHEEL FOR PLUS

52.

Column I		Column II	
A	Longitudinal waves	P	Particles of the medium vibrate perpendicular to the wave propagation.
B	Transverse waves	Q	Two progressive waves of slightly different frequencies superimpose in the same direction
C	Beats	R	Two progressive waves of same frequency superimpose in the opposite directions
D	Stationary waves	S	Particles of the medium vibrate along the wave propagation.

USE CODE PHEEL FOR PLUS

A

A-Q, B-R, C-Q, D-P

B

A-S, B-P, C-Q, D-R

C

A-Q, B-S, C-P, D-R

D

A-P, B-Q, C-S, D-R

USE CODE **PHEEL** FOR PLUS

52.

Column I		Column II	
A	Longitudinal waves	P	Particles of the medium vibrate perpendicular to the wave propagation.
B	Transverse waves	Q	Two progressive waves of slightly different frequencies superimpose in the same direction
C	Beats	R	Two progressive waves of same frequency superimpose in the opposite directions
D	Stationary waves	S	Particles of the medium vibrate along the wave propagation.

USE CODE PHEEL FOR PLUS

A

A-Q, B-R, C-Q, D-P

B

A-S, B-P, C-Q, D-R

C

A-Q, B-S, C-P, D-R

D

A-P, B-Q, C-S, D-R

Use code **PHEEL** FOR PLUS

53. What is the path difference for destructive interference?

A

$$n\lambda$$

B

$$n(\lambda + 1)$$

C

$$\frac{(n+1)\lambda}{2}$$

D

$$\frac{(2n+1)\lambda}{2}$$

USE CODE **PHEEL** FOR PLUS

53. What is the path difference for destructive interference?

A

$$n\lambda$$

B

$$n(\lambda + 1)$$

C

$$\frac{(n+1)\lambda}{2}$$

D

$$\frac{(2n+1)\lambda}{2}$$

USE CODE **PHEEL** FOR PLUS

54. When beats are produced by two progressive waves of the same amplitude and of nearly the same frequency, the ratio of maximum intensity to the intensity of one of the waves will be n . Where n is

A

3

B

1

C

4

D

2

USE CODE **PHEEL** FOR PLUS

54. When beats are produced by two progressive waves of the same amplitude and of nearly the same frequency, the ratio of maximum intensity to the intensity of one of the waves will be n . Where n is

A

3

B

1

C

4

D

2

USE CODE **PHEEL** FOR PLUS

55. The lengths of two closed organ pipes are 0.750 m and 0.770 m. If they are sounded together, 3 beats per second are produced. The velocity of sound will be :-

A

350.5 m/sec

B

335.5 m/sec

C

346.5 m/sec

D

None of these

USE CODE **PHEEL** FOR PLUS

55. The lengths of two closed organ pipes are 0.750 m and 0.770 m. If they are sounded together, 3 beats per second are produced. The velocity of sound will be :-

A

350.5 m/sec

B

335.5 m/sec

C

346.5 m/sec

D

None of these

USE CODE **PHEEL** FOR PLUS

56. Two waves having equation

$$x_1 = a \sin(\omega t + \phi_1) \quad x_2 = a \sin(\omega t + \phi_2)$$

If in the resultant wave the frequency and amplitude remains equals to amplitude of superimposing waves. Then phase diff. between them –

A

$$\frac{\pi}{6}$$

B

$$\frac{2\pi}{3}$$

C

$$\frac{3\pi}{4}$$

D

$$\frac{\pi}{4}$$

USE CODE **PHEEL** FOR PLUS

56. Two waves having equation

$$x_1 = a \sin(\omega t + \phi_1) \quad x_2 = a \sin(\omega t + \phi_2)$$

If in the resultant wave the frequency and amplitude remains equals to amplitude of superimposing waves. Then phase diff. between them –

A

$$\frac{\pi}{6}$$

B

$$\frac{2\pi}{3}$$

C

$$\frac{3\pi}{4}$$

D

$$\frac{\pi}{4}$$

USE CODE **PHEEL** FOR PLUS

57. Two sources have frequency 256 Hz and 258 Hz, then time difference between two consecutive maxima is –

A

1 s

B

0.5 s

C

2 ms

D

None

USE CODE **PHEEL** FOR PLUS

57. Two sources have frequency 256 Hz and 258 Hz, then time difference between two consecutive maxima is –

A

1 s

B

0.5 s

C

2 ms

D

None

USE CODE **PHEEL** FOR PLUS

58. Two vibrating tuning forks produce progressive waves given by $Y_1 = 4 \sin 500\pi t$ and $Y_2 = 2 \sin 506 \pi t$. Number of beats produced per minute is:

A

3

B

360

C

180

D

60

USE CODE **PHEEL** FOR PLUS

58. Two vibrating tuning forks produce progressive waves given by $Y_1 = 4 \sin 500\pi t$ and $Y_2 = 2 \sin 506 \pi t$. Number of beats produced per minute is:

A

3

B

360

C

180

D

60

USE CODE **PHEEL** FOR PLUS

59. Two plane progressive waves shows destructive interference at point P. Which of the following statement is true at point P :-

A

Crest of one wave is superimposed on crest of another wave

B

Trough of one wave is superimposed on crest of another wave

C

Intensity of resultant wave is equal to the intensity difference of two waves

D

Resultant amplitude is equal to the amplitude sum of two waves

USE CODE **PHEEL** FOR PLUS

59. Two plane progressive waves shows destructive interference at point P. Which of the following statement is true at point P :-

A

Crest of one wave is superimposed on crest of another wave

B

Trough of one wave is superimposed on crest of another wave

C

Intensity of resultant wave is equal to the intensity difference of two waves

D

Resultant amplitude is equal to the amplitude sum of two waves

USE CODE **PHEEL** FOR PLUS

60. A uniform string of length L and mass M is fixed at both ends under tension T , Then it can vibrate with frequency given by the formula.

A

$$f = \frac{1}{2} \sqrt{\frac{T}{ML}}$$

B

$$f = \frac{1}{2L} \sqrt{\frac{T}{M}}$$

C

$$f = \frac{1}{2} \sqrt{\frac{T}{M}}$$

D

$$f = \frac{1}{2} \sqrt{\frac{M}{LT}}$$

USE CODE **PHEEL** FOR PLUS

60. A uniform string of length L and mass M is fixed at both ends under tension T , Then it can vibrate with frequency given by the formula.

A

$$f = \frac{1}{2} \sqrt{\frac{T}{ML}}$$

B

$$f = \frac{1}{2L} \sqrt{\frac{T}{M}}$$

C

$$f = \frac{1}{2} \sqrt{\frac{T}{M}}$$

D

$$f = \frac{1}{2} \sqrt{\frac{M}{LT}}$$

USE CODE **PHEEL** FOR PLUS

61. The speed of transverse waves in a stretched string is 700 cm/s. If the string is 2 m long, the frequency with which it resonates in fundamental mode is:

A

$(7/2)$ Hz

B

$(7/4)$ Hz

C

(14) Hz

D

$(2/7)$ Hz

USE CODE **PHEEL** FOR PLUS

61. The speed of transverse waves in a stretched string is 700 cm/s. If the string is 2 m long, the frequency with which it resonates in fundamental mode is:

A

$(7/2)$ Hz

B

$(7/4)$ Hz

C

(14) Hz

D

$(2/7)$ Hz

USE CODE **PHEEL** FOR PLUS

62. With the increase of temperature, the frequency of the organ pipe-

A increases

B decreases

C remains unchanged

D can not say

USE CODE **PHEEL** FOR PLUS

62. With the increase of temperature, the frequency of the organ pipe-

A

increases

B

decreases

C

remains unchanged

D

can not say

USE CODE **PHEEL** FOR PLUS

63. An empty vessel is partially filled with water the frequency of vibration of air column in the vessel

A decreases

B increases

C depends on the purity of water

D remains the same

USE CODE **PHEEL** FOR PLUS

63. An empty vessel is partially filled with water the frequency of vibration of air column in the vessel

A decreases

B increases

C depends on the purity of water

D remains the same

USE CODE **PHEEL** FOR PLUS

64. A string is rigidly fixed at two ends and its equation is given by $y = \cos 2\pi t \sin 2\pi x$. Then the minimum length of the string is

A

1m

B

1/2m

C

5m

D

2π m

USE CODE **PHEEL** FOR PLUS

64. A string is rigidly fixed at two ends and its equation is given by $y = \cos 2\pi t \sin 2\pi x$
Then minimum length of string is

A

1m

B

1/2m

C

5m

D

2π m

USE CODE **PHEEL** FOR PLUS

65. A wave represented by the equation $y = a \cos(\omega t - kx)$ is superposed by another wave to form a stationary wave such that the point $x = 0$ is a node. The equation for other wave is –

A

$$y = a \sin(\omega t + kx)$$

B

$$y = -a \cos(\omega t - kx)$$

C

$$y = -a \cos(\omega t + kx)$$

D

$$y = -a \sin(\omega t - kx)$$

USE CODE **PHEEL** FOR PLUS

65. A wave represented by the equation $y = a \cos(\omega t - kx)$ is superposed by another wave to form a stationary wave such that the point $x = 0$ is a node. The equation for other wave is –

A $y = a \sin(\omega t + kx)$

B $y = -a \cos(\omega t - kx)$

C $y = -a \cos(\omega t + kx)$

D $y = -a \sin(\omega t - kx)$

USE CODE **PHEEL** FOR PLUS

66. A stretched string is vibrating according to the equation $y = 5 \sin\left(\frac{\pi x}{2}\right) \cos 4\pi t$, where y and x are in cm and t is in sec. The distance between two consecutive nodes on the strings is :-

A

2 cm

B

4 cm

C

8 cm

D

16 cm

USE CODE **PHEEL** FOR PLUS

66. A stretched string is vibrating according to the equation $y = 5 \sin\left(\frac{\pi x}{2}\right) \cos 4\pi t$, where y and x are in cm and t is in sec. The distance between two consecutive nodes on the strings is :-

A

2 cm

B

4 cm

C

8 cm

D

16 cm

USE CODE **PHEEL** FOR PLUS

67. The end correction of resonance tube is 1 cm. If lowest resonant length is 15 cm then next resonant length will be :-

A

36 cm

B

45 cm

C

46 cm

D

47 cm

USE CODE **PHEEL** FOR PLUS

67. The end correction of resonance tube is 1 cm. If lowest resonant length is 15 cm then next resonant length will be :-

A

36 cm

B

45 cm

C

46 cm

D

47 cm

USE CODE **PHEEL** FOR PLUS

68. If the fundamental frequency for a COP is n , then the next three overtones will have ratio :-

A

2 : 3 : 4

B

3 : 4 : 5

C

3 : 7 : 11

D

3 : 5 : 7

USE CODE **PHEEL** FOR PLUS

68. If the fundamental frequency for a COP is n , then the next three overtones will have ratio :-

A

2 : 3 : 4

B

3 : 4 : 5

C

3 : 7 : 11

D

3 : 5 : 7

USE CODE **PHEEL** FOR PLUS

69. A tube closed at one end and containing air produces, when excited, the fundamental note of frequency 512 Hz. If the tube is open at both ends, the fundamental frequency that can be excited is (in Hz)

A

1024

B

512

C

256

D

128

USE CODE **PHEEL** FOR PLUS

69. A tube closed at one end and containing air produces, when excited, the fundamental note of frequency 512 Hz. If the tube is open at both ends, the fundamental frequency that can be excited is (in Hz)

A

1024

B

512

C

256

D

128

USE CODE **PHEEL** FOR PLUS

70. An air column in pipe, which is closed at one end will be in resonance with a vibrating tuning fork of frequency 264 Hz if the length of the column in cm is : [$v = 330 \text{ m/s}$]

A

31.25

B

62.50

C

110

D

125

USE CODE **PHEEL** FOR PLUS

70. An air column in pipe, which is closed at one end will be in resonance with a vibrating tuning fork of frequency 264 Hz if the length of the column in cm is : [$v = 330$ m/s]

A

31.25

B

62.50

C

110

D

125

USE CODE **PHEEL** FOR PLUS

71. Velocity of sound in air is 320 m/s. A pipe closed at one end has a length of 1 m neglecting end corrections, the air column in the pipe can resonant for sound of frequency.

(a) 80 Hz

(b) 240 Hz

(c) 500 Hz

(d) 400 Hz

A

a

B

a,b

C

a,b,d

D

a,d

USE CODE **PHEEL** FOR PLUS

71. Velocity of sound in air is 320 m/s. A pipe closed at one end has a length of 1 m neglecting end corrections, the air column in the pipe can resonant for sound of frequency.

(a) 80 Hz

(b) 240 Hz

(c) 500 Hz

(d) 400 Hz

A

a

B

a,b

C

a,b,d

D

a,d

USE CODE **PHEEL** FOR PLUS

72. The velocity of sound in air is 330 m/s. The fundamental frequency of an organ pipe open at both ends and of length 0.3 metre will be:

A

200 Hz

B

550 Hz

C

300 Hz

D

275 Hz

USE CODE **PHEEL** FOR PLUS

72. The velocity of sound in air is 330 m/s. The fundamental frequency of an organ pipe open at both ends and of length 0.3 metre will be:

A

200 Hz

B

550 Hz

C

300 Hz

D

275 Hz

USE CODE **PHEEL** FOR PLUS

73. A hollow metallic tube of length L and closed at one end produce resonance with a tuning fork of frequency n . The entire tube is then heated carefully so that at equilibrium temperature its length changes by ℓ . If the change in velocity V of sound is v , the resonance will now be produced by tuning fork of frequency.

A $(V + v) / [4(L + \ell)]$

B $(V + v) / [4(L - \ell)]$

C $(V - v) / [4(L + \ell)]$

D $(V - v) / [4(L - \ell)]$

USE CODE **PHEEL** FOR PLUS

73. A hollow metallic tube of length L and closed at one end produce resonance with a tuning fork of frequency n . The entire tube is then heated carefully so that at equilibrium temperature its length changes by ℓ . If the change in velocity V of sound is v , the resonance will now be produced by tuning fork of frequency.

A $(V + v) / [4(L + \ell)]$

B $(V + v) / [4(L - \ell)]$

C $(V - v) / [4(L + \ell)]$

D $(V - v) / [4(L - \ell)]$

USE CODE **PHEEL** FOR PLUS

74. A wave of frequency 100 Hz travels along a string towards its fixed end. When this wave travels back, after reflection, a node is formed at a distance of 10 cm from the fixed end. The speed of the wave (incident and reflected) is :

A

5 m/s

B

10 m/s

C

20 m/s

D

40 m/s

USE CODE **PHEEL** FOR PLUS

74. A wave of frequency 100 Hz travels along a string towards its fixed end. When this wave travels back, after reflection, a node is formed at a distance of 10 cm from the fixed end. The speed of the wave (incident and reflected) is :

A

5 m/s

B

10 m/s

C

20 m/s

D

40 m/s

USE CODE **PHEEL** FOR PLUS

75. Stationary wave is represented by $Y = A \sin (100 t) \cos (0.01 x)$ where y and A are in mm, t in sec and x in m. The velocity of the wave:

A

1 m/s

B

10^2 m/s

C

10^4 m/s

D

zero

USE CODE **PHEEL** FOR PLUS

75. Stationary wave is represented by $Y = A \sin (100 t) \cos (0.01 x)$ where y and A are in mm, t in sec and x in m. The velocity of the wave:

A

1 m/s

B

10^2 m/s

C

10^4 m/s

D

zero

USE CODE **PHEEL** FOR PLUS

76. If the tension in a sonometer wire is increased by a factor of four then fundamental frequency of vibration changes by a factor of :

A

4

B

$(1/4)$

C

2

D

$(1/2)$

USE CODE **PHEEL** FOR PLUS

76. If the tension in a sonometer wire is increased by a factor of four then fundamental frequency of vibration changes by a factor of :

A

4

B

$(1/4)$

C

2

D

$(1/2)$

USE CODE **PHEEL** FOR PLUS

77. A sonometer wire, with a suspended mass of $M = 1 \text{ kg.}$, is in resonance with a given tuning fork. The apparatus is taken to moon where the acceleration due to gravity is $1/6$ that of earth. To obtain resonance on the moon, the value of M should be

A

1 kg.

B

$\sqrt{6}$ kg

C

6 kg

D

36 kg

USE CODE **PHEEL** FOR PLUS

77. A sonometer wire, with a suspended mass of $M = 1 \text{ kg.}$, is in resonance with a given tuning fork. The apparatus is taken to moon where the acceleration due to gravity is $1/6$ that of earth. To obtain resonance on the moon, the value of M should be

A

1 kg.

B

$\sqrt{6}$ kg

C

6 kg

D

36 kg

USE CODE **PHEEL** FOR PLUS

78. Stationary waves are produced in 10m long stretched string. If the string vibrates in 5 segments and wave velocity is 20m/sec, then the frequency is-

A

10 Hz

B

5 Hz

C

4 Hz

D

2Hz

USE CODE **PHEEL** FOR PLUS

78. Stationary waves are produced in 10m long stretched string. If the string vibrates in 5 segments and wave velocity is 20m/sec, then the frequency is-

A

10 Hz

B

5 Hz

C

4 Hz

D

2Hz

USE CODE **PHEEL** FOR PLUS

79. A standing wave having 3 nodes and 2 antinodes is formed between 1.21 Å distance then the wavelength is :-

A

1.21 Å

B

2.42 Å

C

0.605 Å

D

4.84 Å

USE CODE **PHEEL** FOR PLUS

79. A standing wave having 3 nodes and 2 antinodes is formed between 1.21 Å distance then the wavelength is :-

A

1.21 Å

B

2.42 Å

C

0.605 Å

D

4.84 Å

USE CODE **PHEEL** FOR PLUS

80. A string under a tension of 129.6 N produces 10 beats/sec when it is vibrated along with a tuning fork. When the tension is the string is increased to 160 N it sounds in unison with same tuning fork. Calculate fundamental freq. of tuning fork.

A

100 Hz

B

50 Hz

C

150 Hz

D

200 Hz

USE CODE **PHEEL** FOR PLUS

80. A string under a tension of 129.6 N produces 10 beats/sec when it is vibrated along with a tuning fork. When the tension is the string is increased to 160 N it sounds in unison with same tuning fork. Calculate fundamental freq. of tuning fork.

A

100 Hz

B

50 Hz

C

150 Hz

D

200 Hz

USE CODE **PHEEL** FOR PLUS

81. If vibrations of a string are to be increased to a factor of two, then tension in the string must be made :

A

half

B

thrice

C

four times

D

eight times

USE CODE **PHEEL** FOR PLUS

81. If vibrations of a string are to be increased to a factor of two, then tension in the string must be made :

A

half

B

thrice

C

four times

D

eight times

USE CODE **PHEEL** FOR PLUS

82. An air column having one end closed contains minimum resonance length 50 cm. If it is vibrated by same tuning fork then its next resonance length will be –

A

250 cm

B

200 cm

C

150 cm

D

100 cm

USE CODE **PHEEL** FOR PLUS

82. An air column having one end closed contains minimum resonance length 50 cm. If it is vibrated by same tuning fork then its next resonance length will be –

A

250 cm

B

200 cm

C

150 cm

D

100 cm

USE CODE **PHEEL** FOR PLUS

83. Stationary waves are so called because in them –

- A The particles of the medium are not disturbed at all
- B The particles of the medium do not execute S.H. M.
- C There occur no flow of energy along the wave
- D The interference effect can't be observed

USE CODE **PHEEL** FOR PLUS

83. Stationary waves are so called because in them –

- A The particles of the medium are not disturbed at all
- B The particles of the medium do not execute S.H. M.
- C There occur no flow of energy along the wave
- D The interference effect can't be observed

USE CODE **PHEEL** FOR PLUS

84. The maximum length of a closed pipe that would produce a just audible sound is ($v_{\text{sound}} = 336 \text{ m/s}$)

A

4.2 cm

B

4.2 m

C

4.2 mm

D

1.0 cm

USE CODE **PHEEL** FOR PLUS

84. The maximum length of a closed pipe that would produce a just audible sound is ($v_{\text{sound}} = 336 \text{ m/s}$)

A

4.2 cm

B

4.2 m

C

4.2 mm

D

1.0 cm

USE CODE **PHEEL** FOR PLUS

85. In a sonometer wire, the tension is maintained by suspending a mass M from free end of wire. The fundamental frequency of the wire is N Hz. If the suspended mass is completely immersed in water the fundamental frequency will

A

increases

B

constant

C

decrease

D

can't say

USE CODE **PHEEL** FOR PLUS

85. In a sonometer wire, the tension is maintained by suspending a mass M from free end of wire. The fundamental frequency of the wire is N Hz. If the suspended mass is completely immersed in water the fundamental frequency will

A

increases

B

constant

C

decrease

D

can't say

USE CODE **PHEEL** FOR PLUS

86. A second harmonic has to be generated in a string of length l stretched between two rigid supports. The points where the string has to be plucked and touched are –

A

Pluck at $\frac{l}{2}$ touch at $\frac{3l}{4}$

B

Pluck at $\frac{l}{2}$ touch at $\frac{l}{4}$

C

Pluck at $\frac{l}{4}$ touch at $\frac{3l}{4}$

D

Pluck at $\frac{l}{4}$ touch at $\frac{l}{2}$

USE CODE PHEEL FOR PLUS

86. A second harmonic has to be generated in a string of length l stretched between two rigid supports. The points where the string has to be plucked and touched are –

A

Pluck at $\frac{l}{2}$ touch at $\frac{3l}{4}$

B

Pluck at $\frac{l}{2}$ touch at $\frac{l}{4}$

C

Pluck at $\frac{l}{4}$ touch at $\frac{3l}{4}$

D

Pluck at $\frac{l}{4}$ touch at $\frac{l}{2}$

USE CODE PHEEL FOR PLUS

87. A wave is represented by the equation $y = a \sin(kx - \omega t)$ is superimposed with another wave to form a stationary wave such that the point $x = 0$ is a node. Then the equation of other wave is –

A

$$y = a \cos(kx - \omega t)$$

B

$$y = a \cos(kx + \omega t)$$

C

$$y = -a \sin(kx + \omega t)$$

D

$$y = a \sin(kx + \omega t)$$

USE CODE **PHEEL** FOR PLUS

87. A wave is represented by the equation $y = a \sin(kx - \omega t)$ is superimposed with another wave to form a stationary wave such that the point $x = 0$ is a node. Then the equation of other wave is –

A

$$y = a \cos(kx - \omega t)$$

B

$$y = a \cos(kx + \omega t)$$

C

$$y = -a \sin(kx + \omega t)$$

D

$$y = a \sin(kx + \omega t)$$

USE CODE **PHEEL** FOR PLUS

88. If the air column in a pipe which is closed at one end, is in resonance with a vibrating tuning fork of frequency 260 Hz, then the length of the air column is :

A

35.7 cm

B

31.7 cm

C

12.5 cm

D

62.5 cm

USE CODE **PHEEL** FOR PLUS

88. If the air column in a pipe which is closed at one end, is in resonance with a vibrating tuning fork of frequency 260 Hz, then the length of the air column is :

A

35.7 cm

B

31.7 cm

C

12.5 cm

D

62.5 cm

USE CODE **PHEEL** FOR PLUS

89. If the tension and diameter of a sonometer wire of fundamental frequency (n) is doubled and density is halved then its fundamental frequency will become :-

A

$$\frac{n}{4}$$

B

$$\sqrt{2}n$$

C

$$n$$

D

$$\frac{n}{\sqrt{2}}$$

USE CODE **PHEEL** FOR PLUS

89. If the tension and diameter of a sonometer wire of fundamental frequency (n) is doubled and density is halved then its fundamental frequency will become :-

A

$$\frac{n}{4}$$

B

$$\sqrt{2}n$$

C

$$n$$

D

$$\frac{n}{\sqrt{2}}$$

USE CODE **PHEEL** FOR PLUS

90. The tension in a piano wire is 10N. What should be the tension in the wire to produce a note of double the frequency ?

A

10N

B

20N

C

40N

D

80N

USE CODE **PHEEL** FOR PLUS

90. The tension in a piano wire is 10N. What should be the tension in the wire to produce a note of double the frequency ?

A

10N

B

20N

C

40N

D

80N

USE CODE **PHEEL** FOR PLUS

91. A sound wave of frequency 330Hz is incident normally at reflected wall then minimum distance from wall at which particle vibrate very much :-
($V_{\text{sound}} = 330 \text{ m/s}$)

A

0.25 m

B

0.125 m

C

1 m

D

0.5 m

USE CODE **PHEEL** FOR PLUS

91. A sound wave of frequency 330Hz is incident normally at reflected wall then minimum distance from wall at which particle vibrate very much :-
($V_{\text{sound}} = 330 \text{ m/s}$)

A

0.25 m

B

0.125 m

C

1 m

D

0.5 m

USE CODE **PHEEL** FOR PLUS

92. An open organ pipe of length 33 cm, vibrates with frequency 1000 Hz. If velocity of sound is 330 m/s, then its frequency is:-

A Fundamental frequency

B First overtone of pipe

C Second overtone

D Fourth overtone

USE CODE **PHEEL** FOR PLUS

92. An open organ pipe of length 33 cm, vibrates with frequency 1000 Hz. If velocity of sound is 330 m/s, then its frequency is:-

A Fundamental frequency

B First overtone of pipe

C Second overtone

D Fourth overtone

USE CODE **PHEEL** FOR PLUS

93. Fundamental frequency of sonometer wire is n . If the length, tension and diameter of wire are tripled, the new fundamental frequency is :-

A

$$n/\sqrt{3}$$

B

$$n/3$$

C

$$n\sqrt{3}$$

D

$$n/3\sqrt{3}$$

USE CODE **PHEEL** FOR PLUS

93. Fundamental frequency of sonometer wire is n . If the length, tension and diameter of wire are tripled, the new fundamental frequency is :-

A

$$n/\sqrt{3}$$

B

$$n/3$$

C

$$n\sqrt{3}$$

D

$$n/3\sqrt{3}$$

USE CODE **PHEEL** FOR PLUS

94. A string in a musical instrument is 50 cm long and its fundamental frequency is 800 Hz. If a frequency of 1000 Hz is to be produced, then required length of string is :

A

62.5 cm

B

50 cm

C

40 cm

D

37.5

USE CODE **PHEEL** FOR PLUS

94. A string in a musical instrument is 50 cm long and its fundamental frequency is 800 Hz. If a frequency of 1000 Hz is to be produced, then required length of string is :

A

62.5 cm

B

50 cm

C

40 cm

D

37.5

USE CODE **PHEEL** FOR PLUS

95. Four wires of identical lengths, diameters and of the same material are stretched on a sonometer wire. The ratio of their tension is $1 : 4 : 9 : 16$. The ratio of their fundamental frequencies is

A

$1 : 2 : 3 : 4$

B

$16 : 9 : 4 : 1$

C

$1 : 4 : 9 : 16$

D

$4 : 3 : 2 : 1$

USE CODE **PHEEL** FOR PLUS

95. Four wires of identical lengths, diameters and of the same material are stretched on a sonometer wire. The ratio of their tension is $1 : 4 : 9 : 16$. The ratio of their fundamental frequencies is

A

$1 : 2 : 3 : 4$

B

$16 : 9 : 4 : 1$

C

$1 : 4 : 9 : 16$

D

$4 : 3 : 2 : 1$

USE CODE **PHEEL** FOR PLUS

96. Given equation is related to

$$y = \cos\left(\frac{2\pi}{\lambda}x\right) \cos(2\pi vt)$$

- A Transverse progressive
- B Longitudinal progressive
- C Longitudinal stationary wave
- D Transverse stationary wave

USE CODE **PHEEL** FOR PLUS

96. Given equation is related to

$$y = \cos\left(\frac{2\pi}{\lambda}x\right) \cos(2\pi vt)$$

- A Transverse progressive
- B Longitudinal progressive
- C Longitudinal stationary wave
- D Transverse stationary wave

USE CODE **PHEEL** FOR PLUS

97. If V is the speed of sound in air then the shortest length of the closed pipe which resonants to a frequency n :

A

$$\frac{V}{2n}$$

B

$$\frac{V}{4n}$$

C

$$\frac{4n}{V}$$

D

$$\frac{2n}{V}$$

USE CODE **PHEEL** FOR PLUS

97. If V is the speed of sound in air then the shortest length of the closed pipe which resonants to a frequency n :

A

$$\frac{V}{2n}$$

B

$$\frac{V}{4n}$$

C

$$\frac{4n}{V}$$

D

$$\frac{2n}{V}$$

USE CODE **PHEEL** FOR PLUS

98. A stretched string is 1 m long. Its mass per unit length is 0.5 g/m. It is stretched with a force of 20 N. It plucked at a distance of 25 cm from one end. The frequency of note emitted by it will be:

A

400 Hz

B

300 Hz

C

200 Hz

D

100 Hz

USE CODE **PHEEL** FOR PLUS

98. A stretched string is 1 m long. Its mass per unit length is 0.5 g/m. It is stretched with a force of 20 N. It plucked at a distance of 25 cm from one end. The frequency of note emitted by it will be:

A

400 Hz

B

300 Hz

C

200 Hz

D

100 Hz

USE CODE **PHEEL** FOR PLUS

99. What is the beat frequency produced when following two waves are sounded together ?

$$x_1 = 10 \sin (404\pi t - 5\pi x),$$

$$x_2 = 10 \sin (400\pi t - 5\pi x).$$

A

4

B

1

C

3

D

2

USE CODE **PHEEL** FOR PLUS

99. What is the beat frequency produced when following two waves are sounded together ?

$$x_1 = 10 \sin (404\pi t - 5\pi x),$$

$$x_2 = 10 \sin (400\pi t - 5\pi x).$$

A

4

B

1

C

3

D

2

USE CODE **PHEEL** FOR PLUS

100. What is minimum length of a tube, open at both ends, that resonates with tuning fork of frequency 350 Hz ? (velocity of sound in air = 350 m/s)

A

50 cm

B

100 cm

C

75 cm

D

25 cm

USE CODE **PHEEL** FOR PLUS

100. What is minimum length of a tube, open at both ends, that resonates with tuning fork of frequency 350 Hz ? (velocity of sound in air = 350 m/s)

A

50 cm

B

100 cm

C

75 cm

D

25 cm

USE CODE **PHEEL** FOR PLUS

101. An underwater sonar source operating at a frequency of 60 kHz directs its beam towards the surface. If velocity of sound in air is 330 m/s, wavelength and frequency of the waves in air are:-

A 5.5 mm, 60 kHz

B 3.30 m, 60kHz

C 5.5 mm, 30 kHz

D 5.5 mm, 80 kHz

USE CODE **PHEEL** FOR PLUS

101. An underwater sonar source operating at a frequency of 60 kHz directs its beam towards the surface. If velocity of sound in air is 330 m/s, wavelength and frequency of the waves in air are:-

A 5.5 mm, 60 kHz

B 3.30 m, 60kHz

C 5.5 mm, 30 kHz

D 5.5 mm, 80 kHz

USE CODE **PHEEL** FOR PLUS

102. An organ pipe closed at one end has fundamental frequency of 1500 Hz. The maximum number of overtones generated by this pipe which a normal person can hear is

A

14

B

13

C

6

D

9

USE CODE **PHEEL** FOR PLUS

102. An organ pipe closed at one end has fundamental frequency of 1500 Hz. The maximum number of overtones generated by this pipe which a normal person can hear is

A

14

B

13

C

6

D

9

USE CODE **PHEEL** FOR PLUS

103. Length of the close organ pipe is 1 m. At which frequency resonance will not occur ($v = 320$ m/sec.)

A

80 Hz

B

240 Hz

C

300 Hz

D

400 Hz

USE CODE **PHEEL** FOR PLUS

103. Length of the close organ pipe is 1 m. At which frequency resonance will not occur ($v = 320$ m/sec.)

A

80 Hz

B

240 Hz

C

300 Hz

D

400 Hz

USE CODE **PHEEL** FOR PLUS

104. A 10 cm long organ pipe is open at one end and closed at other end. What is the maximum wavelength of wave produced by it :-

A

40cm

B

20cm

C

10cm

D

5cm

USE CODE **PHEEL** FOR PLUS

104. A 10 cm long organ pipe is open at one end and closed at other end. What is the maximum wavelength of wave produced by it :-

A

40cm

B

20cm

C

10cm

D

5cm

USE CODE **PHEEL** FOR PLUS

105. An open resonating tube has fundamental frequency of n . When half of its length is dipped into water, then its fundamental frequency will be:

A

n

B

$n/2$

C

$2n$

D

$3/2 n.$

USE CODE **PHEEL** FOR PLUS

105. An open resonating tube has fundamental frequency of n . When half of its length is dipped into water, then its fundamental frequency will be:

A

n

B

$n/2$

C

$2n$

D

$3/2 n.$

USE CODE **PHEEL** FOR PLUS

106. A pipe is closed from one end and open from another end then which statement is true ?

- A Node is formed slightly above the open end.
- B Node is formed slightly below the open end.
- C Antinode is formed slightly above the open end.
- D Antinode formed slightly below the open end.

USE CODE **PHEEL** FOR PLUS

106. A pipe is closed from one end and open from another end then which statement is true ?

- A Node is formed slightly above the open end.
- B Node is formed slightly below the open end.
- C Antinode is formed slightly above the open end.
- D Antinode formed slightly below the open end.

107. The apparent change in the pitch of sound due to relative motion between observer and the source is called:

A

Doppler's effect

B

Resonance of waves

C

interference

D

none of the above

USE CODE **PHEEL** FOR PLUS

107. The apparent change in the pitch of sound due to relative motion between observer and the source is called:

A

Doppler's effect

B

Resonance of waves

C

interference

D

none of the above

USE CODE **PHEEL** FOR PLUS

108. A siren blown in workshop emits waves of frequency 1000 Hz. A car driver approaches the workshop with velocity 90 km/hour then frequency of sound heard by driver will be in Hz. ($V_{\text{sound}} = 330 \text{ m/s}$)

A

926

B

1076

C

1176

D

1000

USE CODE **PHEEL** FOR PLUS

108. A siren blown in workshop emits waves of frequency 1000 Hz. A car driver approaches the workshop with velocity 90 km/hour then frequency of sound heard by driver will be in Hz. ($V_{\text{sound}} = 330 \text{ m/s}$)

A

926

B

1076

C

1176

D

1000

USE CODE **PHEEL** FOR PLUS

109. A star is continuously moving away from us than the wavelength coming from star on the earth :

- A Will shift towards violet colour
- B Will shift towards red colour.
- C remain unchanged
- D Will shift sometimes towards violet and some other time it will shift towards red colour.

USE CODE PHEEL FOR PLUS

109. A star is continuously moving away from us than the wavelength coming from star on the earth :

- A Will shift towards violet colour
- B Will shift towards red colour.
- C remain unchanged
- D Will shift sometimes towards violet and some other time it will shift towards red colour.

USE CODE PHEEL FOR PLUS

110. A source of frequency 200 Hz is moving towards an observer with a velocity equal to the sound velocity V . If observer also moves away from the source with same velocity then apparent frequency heard by observer will be :

A

50 Hz

B

160 Hz

C

150 Hz

D

200 Hz

USE CODE **PHEEL** FOR PLUS

110. A source of frequency 200 Hz is moving towards an observer with a velocity equal to the sound velocity V . If observer also moves away from the source with same velocity then apparent frequency heard by observer will be :

A

50 Hz

B

160 Hz

C

150 Hz

D

200 Hz

USE CODE **PHEEL** FOR PLUS

111. Doppler's effect in the form of frequency doesn't depend upon :

A Frequency produced by waves

B Velocity of source

C Velocity of observer.

D Separation between source & observer.

USE CODE **PHEEL** FOR PLUS

111. Doppler's effect in the form of frequency doesn't depend upon :

A Frequency produced by waves

B Velocity of source

C Velocity of observer.

D Separation between source & observer.

USE CODE **PHEEL** FOR PLUS

112. The wavelength of the light received from a galaxy is 0.4% greater than the wave length on the earth then the velocity of galaxy relative to the earth will be:

A $1.2 \times 10^7 \text{ m/sec}$

B $1.2 \times 10^6 \text{ m/sec}$

C $1.2 \times 10^5 \text{ m/sec}$

D $1.2 \times 10^4 \text{ m/sec}$

USE CODE **PHEEL** FOR PLUS

112. The wavelength of the light received from a galaxy is 0.4% greater than the wave length on the earth then the velocity of galaxy relative to the earth will be:

A $1.2 \times 10^7 \text{ m/sec}$

B $1.2 \times 10^6 \text{ m/sec}$

C $1.2 \times 10^5 \text{ m/sec}$

D $1.2 \times 10^4 \text{ m/sec}$

USE CODE **PHEEL** FOR PLUS

113. The term "Red shift" referring to doppler's effect for light represent which of following property :

A decrease in frequency

B increase in frequency

C decrease in intensity

D Increase in intensity

USE CODE PHEEL FOR PLUS

113. The term "Red shift" referring to doppler's effect for light represent which of following property :

A decrease in frequency

B increase in frequency

C decrease in intensity

D Increase in intensity

USE CODE **PHEEL** FOR PLUS

114. A source and an observer moves away from each other, with a velocity of 15 m/sec with respect to ground. If observer finds the frequency of sound coming from source as 1950 Hz. Then actual frequency of source will be (velocity of sound = 340 m/sec.) :

A

1785 Hz

B

1968 Hz

C

1950 Hz

D

2130 Hz

USE CODE **PHEEL** FOR PLUS

114. A source and an observer moves away from each other, with a velocity of 15 m/sec with respect to ground. If observer finds the frequency of sound coming from source as 1950 Hz. Then actual frequency of source will be (velocity of sound = 340 m/sec.) :

A

1785 Hz

B

1968 Hz

C

1950 Hz

D

2130 Hz

USE CODE **PHEEL** FOR PLUS

115. A source of sound of frequency n and a listener approach each other with a velocity equal to $\frac{1}{20}$ of velocity of sound. The apparent frequency heard by the listener is :

A

$$\left(\frac{21}{19}\right)n$$

B

$$\left(\frac{20}{21}\right)n$$

C

$$\left(\frac{21}{20}\right)n$$

D

$$\left(\frac{19}{20}\right)n$$

USE CODE **PHEEL** FOR PLUS

115. A source of sound of frequency n and a listener approach each other with a velocity equal to $\frac{1}{20}$ of velocity of sound. The apparent frequency heard by the listener is :

A

$$\left(\frac{21}{19}\right)n$$

B

$$\left(\frac{20}{21}\right)n$$

C

$$\left(\frac{21}{20}\right)n$$

D

$$\left(\frac{19}{20}\right)n$$

USE CODE **PHEEL** FOR PLUS

116. A source of sound of frequency 1000 Hz is moving with a uniform velocity 20 m/s. The ratio of apparent frequency heard by the observer before and after the source crosses him would be :
[v= 340 m/s]

A

9 : 8

B

8 : 9

C

1 : 1

D

9 : 10

USE CODE **PHEEL** FOR PLUS

116. A source of sound of frequency 1000 Hz is moving with a uniform velocity 20 m/s. The ratio of apparent frequency heard by the observer before and after the source crosses him would be :
[v= 340 m/s]

A

9 : 8

B

8:9

C

1:1

D

9:10

USE CODE **PHEEL** FOR PLUS

117. Two sound sources (of same frequency) are placed at distance of 100 meter. An observer, when moving between both sources, hears 4 beats per second. The distance between sound source is now changed to 400 meter then the beats/second heard by observer will be:

A

2

B

4

C

8

D

16

USE CODE **PHEEL** FOR PLUS

117. Two sound sources (of same frequency) are placed at distance of 100 meter. An observer, when moving between both sources, hears 4 beats per second. The distance between sound source is now changed to 400 meter then the beats/second heard by observer will be:

A

2

B

4

C

8

D

16

USE CODE **PHEEL** FOR PLUS

118. Doppler effect for sound depends upon the relative motion of source and listener and it also depends upon that which one of these is in motion. Whereas in doppler effect for light it only depends upon the relative motion of the source of light and observer. The reason for it is :

A Einstein's mass energy relation

B Einstein's theory of relativity

C Photo electric effect

D none of above

USE CODE **PHEEL** FOR PLUS

118. Doppler effect for sound depends upon the relative motion of source and listener and it also depends upon that which one of these is in motion. Whereas in doppler effect for light it only depends upon the relative motion of the source of light and observer. The reason for it is :

A Einstein's mass energy relation

B Einstein's theory of relativity

C Photo electric effect

D none of above

USE CODE **PHEEL** FOR PLUS

119. A source of sound of frequency 500 Hz is moving towards an observer with velocity 30 m/s. The speed of sound is 330 m/s. The frequency heard by the observer will be :

A

550 Hz

B

458.3 Hz

C

530 Hz

D

545.5 Hz

USE CODE **PHEEL** FOR PLUS

119. A source of sound of frequency 500 Hz is moving towards an observer with velocity 30 m/s. The speed of sound is 330 m/s. The frequency heard by the observer will be :

A

550 Hz

B

458.3 Hz

C

530 Hz

D

545.5 Hz

USE CODE **PHEEL** FOR PLUS

120. A bus is moving with a velocity of 5 m/s towards a huge wall. The driver sounds a horn of frequency 165Hz. If the speed of sound in air is 335 m/s, No. of beats heard by a passenger on bus will be—

A

6

B

5

C

3

D

4

USE CODE **PHEEL** FOR PLUS

120. A bus is moving with a velocity of 5 m/s towards a huge wall. The driver sounds a horn of frequency 165Hz. If the speed of sound in air is 335 m/s, No. of beats heard by a passenger on bus will be—

A

6

B

5

C

3

D

4

USE CODE **PHEEL** FOR PLUS

121. A sound source is going away from an observer with the sound speed. The apparent frequency which the observer listen

A

will be half

B

will remains same

C

will be double

D

will not be observed

USE CODE **PHEEL** FOR PLUS

121. A sound source is going away from an observer with the sound speed. The apparent frequency which the observer listen

A

will be half

B

will remains same

C

will be double

D

will not be observed

USE CODE **PHEEL** FOR PLUS

122. The wavelength of a distant star is 5700 \AA and the spectral light has a shift of 1.9 \AA towards red end then the velocity of star relative to the earth will be:

A $5 \times 10^5 \text{ m/sec}$

B $2 \times 10^5 \text{ m/sec}$

C $1.8 \times 10^5 \text{ m/sec}$

D $1 \times 10^5 \text{ m/sec.}$

USE CODE **PHEEL** FOR PLUS

122. The wavelength of a distant star is 5700 \AA and the spectral light has a shift of 1.9 \AA towards red end then the velocity of star relative to the earth will be:

A $5 \times 10^5 \text{ m/sec}$

B $2 \times 10^5 \text{ m/sec}$

C $1.8 \times 10^5 \text{ m/sec}$

D $1 \times 10^5 \text{ m/sec.}$

USE CODE **PHEEL** FOR PLUS

123. Two trains A and B are moving in the same direction with velocities 30 m/s and 10 m/s respectively. B is behind from A and A blows a horn of frequency 450 Hz. Then the apparent frequency heard by observer on train B is (speed of sound is 330 m/s):

A

425 Hz

B

300 Hz

C

450 Hz

D

350 Hz

USE CODE **PHEEL** FOR PLUS

123. Two trains A and B are moving in the same direction with velocities 30 m/s and 10 m/s respectively. B is behind from A and A blows a horn of frequency 450 Hz. Then the apparent frequency heard by observer on train B is (speed of sound is 330 m/s):

A

425 Hz

B

300 Hz

C

450 Hz

D

350 Hz

USE CODE **PHEEL** FOR PLUS

124. If a star emitting light of wavelength 5000 \AA is moving towards earth with a velocity of $1.5 \times 10^6 \text{ m/s}$ then the shift in the wavelength due to Doppler's effect will be :

A

2.5 \AA

B

250 \AA

C

25 \AA

D

Zero

USE CODE **PHEEL** FOR PLUS

124. If a star emitting light of wavelength 5000 \AA is moving towards earth with a velocity of $1.5 \times 10^6 \text{ m/s}$ then the shift in the wavelength due to Doppler's effect will be :

A

2.5 \AA

B

250 \AA

C

25 \AA

D

Zero

USE CODE **PHEEL** FOR PLUS

125. Two stationary sources each emitting waves of wave length λ . An observer moves from one source to other with velocity u . Then number of beats heard by him :-

A

$$\frac{2u}{\lambda}$$

B

$$\frac{u}{\lambda}$$

C

$$\sqrt{u\lambda}$$

D

$$\frac{u}{2\lambda}$$

USE CODE **PHEEL** FOR PLUS

125. Two stationary sources each emitting waves of wave length λ . An observer moves from one source to other with velocity u . Then number of beats heard by him :-

A

$$\frac{2u}{\lambda}$$

B

$$\frac{u}{\lambda}$$

C

$$\sqrt{u\lambda}$$

D

$$\frac{u}{2\lambda}$$

USE CODE **PHEEL** FOR PLUS

126. A vehicle, with a horn of frequency n is moving with a velocity of 30 m/s in a direction perpendicular to the straight line joining the observer and the vehicle. The observer perceives the sound to have a frequency $n + n_1$. Then : (Take velocity of sound in air 330 m/s) :

A

$$n_1 = 10 n$$

B

$$n_1 = -n$$

C

$$n_1 = 0$$

D

$$n_1 = 2n$$

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127. Doppler effect for light differs from that for sound in regards that :

- A the relative frequency shift is smaller for light than for sound.
- B the velocity addition valid for sound is not true for light waves.
- C velocity of light is very large as compared to sound.
- D light waves are electromagnetic waves but sound waves are mechanical.

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128. If a source is moving away from a stationary observer with half of velocity of sound. The frequency observed will be :-

A

one-third

B

doubled

C

halved

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129. A siren emitting sound of frequency 800 Hz is going away, from a static listener, with a speed of 30 m/s. Frequency of sound to be heard by the listener is : (Velocity of sound = 330 m/s) :-

A

286.5 Hz

B

481.2 Hz

C

733.3 Hz

D

644.8 Hz

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130. As temperature increase, difference between apparent doppler frequency and actual frequency

A Decreases

B Remains unchanged

C Increases

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131. An observer moves towards a stationary source of sound with a speed $1/5$ th of the speed of sound. The wavelength and frequency of the source are λ and f respectively. The apparent frequency and wavelength recorded by the observer are respectively :-

A

$1.2f, 1.2\lambda$

B

$1.2f, \lambda$

C

$f, 1.2\lambda$

D

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C

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D

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USE CODE **PHEEL** FOR PLUS

132. Velocity of star is 10^6 m/s and frequency of emitted light is 4.5×10^{14} Hz. If star is moving away, then apparent frequency will be :

A 4.5 Hz.

B 4.5×10^{16} Hz.

C 4.485×10^{14} Hz.

D 4.5×10^8 Hz.

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