PHYSICS

BOOKS - NIKITA PHYSICS (HINGLISH)

STATIONARY WAVES

Mcqs

1. When progressive waves travelling through a medium which are incident normally on a rigid reflecting surface and get reflected with a phase change of

A. $\frac{\pi}{4}$ radian for the formation of stationary waves

B. $\frac{\pi}{2}$ radian for the formation of stationary waves

C. π radian for the formation of stationary waves

D. $\frac{\pi}{3}$ radian for the formation of stationary waves

Answer: C

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2. When progressive waves travelling through a medium which are incident normally on a free end and get reflected with a phase change of

A. $\frac{\pi}{4}$ radian for the formation of stationary waves

B. $\frac{\pi}{2}$ radian for the formation of stationary waves

C. zero

D. $3\frac{\pi}{2}$ radian for the formation of stationary waves

Answer: B

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3. Stationary waves can not be produced in a

A. Thin wire

B. Thick wire

C. Short wire

D. Infinitely long wire

Answer: D

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4. Stationary waves are formed due to super position of two identical progressive waves travelling

A. In opposite direction with same speed

B. In the same direction with different speed

C. Through the medium one after another with the same speed

D. a' and 'c'

Answer: A

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5. In stationary waves , every particles performs

A. S.H.M.

B. S.H.M. except antinode point

C. S.H.M. except node point

D. S.H.M. of all points of medium

Answer: C

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6. In a stationary waves, the period of each oscillating particles is

A. Same

B. Decreases

C. Increases

D. Can not be predicted

Answer: A

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7. In a stationary waves, the amplitude of vibrating paticles

A. Remains constant

B. Zero

C. Varies from particle to particle

D. Maximum

Answer: C

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8. The distance between any two successive nodes or antinodes in stationary waves is

A. λ

B. $\frac{\lambda}{4}$

C. $\frac{\lambda}{2}$

D. $\frac{\lambda}{8}$

Answer: C

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9. The distance between any two successive nodes or antinodes is

A. λ

B. $\frac{\lambda}{4}$

C. $\frac{\lambda}{2}$

D. 2λ

Answer: B

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10. All the particles in a loop of a stationary waves are

A. In opposite phase

B. With phase difference of $\frac{\pi}{2}$ rad

C. In phase

D. Can not be predicted

Answer: C

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11. The velocity of the stationary waves is

A. Zero

B. Increases

C. Constant

D. Decreases

Answer: A

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12. In a stationary waves, the pressure variation is maximum at

A. Antinodes

B. Midway between node and antinode

C. Node

D. Can not be predicted

Answer: C

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13. In a stationary waves, the pressure variation is minimum at

A. Antinodes

B. Midway between node and antinode

C. Node

D. Can not be predicted

Answer: A

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14. The pressure antinode in a stationary waves is a

A. Displacement node

B. Pressure node

C. Displacement antinode

D. Node

Answer: A

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15. The pressure node in a stationary waves is a

A. Displacement antinode

B. Pressure antinode

C. Displacement node

D. Anti Node

Answer: A

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16. The energy can not be transfer in a stationary wave, due to

A. Formation of antinodes

B. The resultant amplitude is zero

C. Formation of node point in the medium

D. Can not be predicted

Answer: C

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17. Particle velocity at the node point in a stationary waves is

A. Maximum

B. Zero

C. Minimum

D. Average velocity

Answer: B

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18. In stationary waves, the maximum strain is at

A. Half the distance form node

B. Displacement antinode

C. Pressure node

D. Node

Answer: D

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19. The adjacent particles in the loop of stationary waves are

A. In opposite phase

B. Phase difference is $\frac{\pi}{2}$ rad

C. Phase difference is $\frac{\pi}{3}$ rad

D. In phase

Answer: D

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20. The antinode is

A. A position of particle which oscillates with maximum amplitude and maximum average speed

B. The mean position of a particle which oscillated with highest amplitude and highest average speed

C. A particle which does not oscillates at all

D. A particle which oscillates with maximum amplitude and lowest average speed

Answer: A

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21. Stationary waves is called standing waves because

A. The particles of the medium remains stationary

B. Particles of the medium do not oscillates at all

C. The wave remains localised to a part of the medium

D. Medium through which it travels is stationary

Answer: C

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22. Standing stationary waves can be obtained in an air column even if the interfering waves are

A. Different frequencies

B. Different amplitudes

C. Different velocities

D. Different wavelength

Answer: B

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23. In a stationary waves, the maximum strees is at

A. Half the distance form node

B. Displacement antinode

C. Pressure node

D. Node

Answer: D

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24. Which of the following statement is not correct in stationary waves ?

A. At a given instant, all particles in a segment are in same phase.

B. All the particles cross the mean position simultaneously.

C. The amplitude of vibration is different for different particles .

D. The time period of vibration is different for different particles

Answer: D

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25. In a stationary waves , energy in a loop is

A. Varies instantaneously

B. Change periodically

C. Depends upon the types of stationary wave

D. Confinet

Answer: D

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26. Velocity of a particle in stationary wave is maximum at

A. Antinodes

B. Node

C. Mid way between node and antinode

D. Can not be predicted

Answer: A

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27. The amplitude of a stationary waves is

A. Constant

B. Varies periodically with distance x

C. Varies periodically with both x and t

D. Varies periodically with time t

Answer: B

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28. The phase difference between two particles at equidistance and which are on either side of a node is

A. 0°

B. 90°

C. 45°

D. 180°

Answer: D

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29. Phase differnce between two particles of a medium lying on the opposite sides of a node is

A. Zero

B. $\frac{\pi}{3}$

C. π

D. 2π

Answer: C

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30. Phase differnce between two particles of a medium lying between two consecutive nodes is

A. $\frac{\pi}{2}$

B. π

C. $\frac{\pi}{3}$

D. Zero

Answer: D

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31. When longitudinal stationary waves are produced in a medium, then the physical characteristics changes at antinode is / are

A. Density only

B. Density and pressure

C. Pressure only

D. Neither density nor pressure

Answer: B

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32. In a longitudinal stationary waves, node is a point of

A. Maximum displacement

B. Maximum density

C. Maximum strain and density

D. Maximum energy

Answer: C

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33. In a stationary wave, displacement

A. Nodes are pressure nodes

B. Nodes are pressure antinodes

C. Nodes are position of atmospheric pressure

D. Antinode are points of constant pressure

Answer: B

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34. In a stationary wave

(A) All the particles of the medium vibrate in phase

(B) All the antinodes vibrate in phase

© All alternate antinodes vibrate in phase

(D) All the particles between consecutive nodes are in phase

A. A and B

B. C and D

C. A and D

D. B and C

Answer: B

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35. When a stationary wave is produced in an isotropic medium

A. Each particle of the medium executive vibration of the same amplitude

B. Amplitude of vibration is maximum at some places

C. Particles of the medium remain stationary

D. The motion of the particle is not periodic

Answer: B

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36. Stationary waves are called, "stationary" because in it

A. Everything remains at rest

B. The particles of the medium are not disturbed at all

C. The particles of the medium are only slightly disturbed

D. There is no flow of energy along the waves

Answer: D

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37. A person hears lounder sound at a point in a stationary wave at

A. Node

B. Antinode

C. Midway between node and antinode

D. Neither node nor the antinode

Answer: A

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38. Velocity of sound in air 300m/s. If the distance between the two successive nodes of a stationary wave of frequency 1000 Hz will be

A. 10 cm

B. 15 cm

C. 20 cm

D. 30 cm

Answer: B

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39. The equation $y=4\cos\left(\frac{2\pi x}{50}\right)\sin(100\pi t)$ represents a stationary wave, where x and y are in cm, and 't' is in s. Then a node occurs at a distance of origin

A. 12.5 cm

B. 50 cm

C. 20 cm

D. $100 / 2\pi$ cm

Answer: A

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40. A wave of length $2m$ is superimposed on its reflected wave to form a stationary wave. A node is located at $x = 3m$, the next node will be located at x equals to

A. 3.25m

B. 3.75m

C. 3.50m

D. 4m

Answer: D

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41. The equation of a stationary wave is

$$y = -4\sin\left(\frac{\pi x}{5}\right)\cos(100\pi t).$$

Amplitude the progressive wave which produced the stationary wave is

A. 1m

B. 4m

C. 2m

D. 8m

Answer: C

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42. The frequency of the progressive wave which form the stationary wave

$y = -4\sin\left(\frac{\pi x}{5}\right)\cos(100\pi t)$ and the distance between two consecutive nodes are

A. 50Hz, 5m

B. 5Hz, 50m

C. 50Hz, 10m

D. 50Hz, 2.5m

Answer: A

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43. The velocity of progressive wave which produces the stationary wave,

$y = 2\sin\left(\frac{\pi x}{100}\right)\cos(\pi t)m$

A. 100 m/s

B. 1 m/s

C. 50 m/s

D. 1000 m/s

Answer: A

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44. In a stationary wave of frequency 200 Hz, the distance between a node and a neighbouring antinode is 0.4m . What the wavelength and velocity of the wave ?

A. 1.6 m, 320 m/s

B. 2.0 m, 360 m/s

C. 1.8m, 340 m/s

D. 2.2 m, 380 m/s

Answer: A

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45. Two identical waves each of frequency 10Hz, are travelling in opposite directions in a medium with a speed of 20 cm/s . Then the distance between adjacent nodes is

A. 1cm

B. 1.2 cm

C. 1.5 cm

D. 2.0 cm

Answer: A

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46. The paritcle displacement (in cm) in a stationary wave is given by $y(x, t) = 2\sin(0.1\pi x)\cos(100\pi t)$. The distance between a node and the next antinode is

A. 2.5 cm

B. 5 cm

C. 7.5 cm

D. 10 cm

Answer: B

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47. The frequency of the above stationary wave is

A. 100Hz

B. 50Hz

C. 314Hz

D. 150Hz

Answer: B

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48. Standing waves are produced by the superposition of two waves

$y_1 = 0.05 \sin(3\pi t - 2x)$ and $y_2 = 0.05 \sin(3\pi t + 2x)$

Where x and y are in metres and t is in second. What is the amplitude of the particle at $x = 0.5$ m ? (Given, $\cos 57.3^\circ = 0.54$)

A. 2.7 cm

B. 5.4 cm

C. 9.98 cm

D. 0.10 cm

Answer: B

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49. The equation of the standing wave is

$$y = 0.02\cos\left(\frac{2\pi x}{60}\right)\sin(150\pi t) \text{ m.}$$

Then the amplitude of vibration of a particle at a distance of 10 m from the origin is

A. Zero

B. 0.02m

C. 0.01m

D. 0.04m

Answer: C

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50. The maximum velocity of the particle in the above problem at a distance of 10 m is

A. 1.5 m/s

B. 4.713 m/s

C. Zero m/s

D. 3 m/s

Answer: B

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51. Two simple harmonic progressive waves is represented by

$$y_1 = 0.01 \sin 2\pi \left(\frac{t}{0.01} - \frac{x}{0.4}\right) \text{ and}$$
$$y_2 = 0.01 \sin 2\pi \left(\frac{t}{0.01} + \frac{x}{0.4}\right),$$

where all quantities are expressed in SI units. The waves combine to form a stationary wave, the equation of the stationary wave is

A. $y = 0.02 \frac{\cos(2\pi x)}{0.4} \frac{\sin(2\pi t)}{0.01}$

B. $y = 0.02 \frac{\cos(2\pi x)}{0.4} \cos\left(\frac{2\pi t}{0.01} + \frac{\pi}{2}\right)$

C. $y = 0.02 \sin\left(\frac{2\pi x}{0.4} + \frac{\pi}{2}\right) \frac{\sin(2\pi t)}{0.01}$

D. All of the above

Answer: D

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52. The amplitude of S.H.M. at antinodes of the problem No. 51 is

A. 0.01 m

B. $\left(\sqrt{3}/2\right) \times 0.02m$

C. 0.02m

D. 0.02×1.714

Answer: C

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53. The amplitude of S.H.M. at x=0.05 m is

A. 0.02 m

B. 0.01 m

C. 0.0141m

D. 1.414 m

Answer: C

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54. The distance between a node the next antinode is

A. 0.01 m

B. 0.02 m

C. 0.0141 m

D. 0.1 m

Answer: D

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55. The distance between two adjacent antinodes is

A. 0.01m

B. 0.02m

C. 0.0141 m

D. 0.2 m

Answer: D

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56. The equation of a stationary wave is given by

$y = 6\sin(\pi)/(x)\cos 40\pi t$ Where y and x are given in cm and time t in second. Then the amplitude of progressive wave is

A. 3cm

B. 6cm

C. 12cm

D. 2cm

Answer: A

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57. In the previous Q. The wavelength of the component progressive wave is

A. 6cm

B. 3cm

C. 12cm

D. 40cm

Answer: A

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58. In the Q.89 the frequency of the component progressive wave is

A. 20Hz

B. 40Hz

C. 1/20Hz

D. 1/40Hz

Answer: A

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59. The value of amplitude at an antinode , on an undamped one dimensional stationary wave of wavelength 1.2 m, is 5mm. Then the value of amplitude of particle at a distance of 15cm from an antinode is

A. 3.535 mm

B. 0.707 mm

C. 5 mm

D. 7.07 mm

Answer: A

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60. The value of amplitude at an antinode , on an undamped one dimensional stationary wave of wavelength 1.2 m, is 5mm. Then the value of amplitude of particle at a distance of 10cm from an node is

A. 5mm

B. 7.07mm

C. 2.5mm

D. 1mm

Answer: C

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61. The equation of a vibrating string is

$y = 0.01 \cos 4\pi \times \sin 200\pi t$

Where all quantities are expressed in SI units. Then the amplitude of component wave is

A. 0.05m

B. 0.005m

C. 0.1m

D. 0.01m

Answer: B

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62. The velocity of the component wave is

A. 50 m/s

B. 100m/s

C. 500 m/s

D. 250m/s

Answer: A

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63. A wave disturbance in a medium is described by $y(x,t) = 0.02\cos\left(50\pi t + \frac{\pi}{2}\right)\cos(10\pi x)$ where x and y are in metre and t is in second . Which of the following is correct ?

A. A, C and D

B. A, B and C

C. A and B only

D. A, B, C and D

Answer: D

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64. A wave of length $2m$ is superimposed on its reflected wave to form a stationary wave. A node is located at $x = 3m$, the next node will be located at x equals to

A. 4m

B. 3.75m

C. 3.50m

D. 3.25m

Answer: C

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65. Two wires whose lengths are in ratio 3:2 are stretched with equal tension and give equal frequency . If the radii of the wires are in the ratio 3:2, then the ratio of densities of the wires is

A. $81:16$

B. $4:9$

C. $16:81$

D. $9 : 4$

Answer: C

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66. Two sound waves each of frequency 500Hz are travelling along the same line in opposite direction . If the speed of sound in air is 350 m/s. find the distance between the consecutive antinodes of the resulting stationary wave.

A. 0.15m

B. 0.25m

C. 0.35m

D. 0.45m

Answer: C

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67. If a wave is propagated along the stretched string in the form

A. Longitudinal wave

B. Electromagnetic wave

C. Transverse wave

D. All of the above

Answer: C

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68. The simplest mode of a vibration of the string is

A. First harmonic

B. Fundamental mode a vibrations

C. First overtone

D. Both a and b

Answer: D

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69. In a simple harmonic mode of vibration, on a string

A. One loop is formed

B. Half loop is formed

C. Two loops are formed

D. Three loops are formed

Answer: A

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70. The lowest frequency of the vibrating string is

A. Fundamental frequency

B. Threshold frequency

C. First frequency

D. a and b

Answer: D

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71. The maximum or thershold wavelength of transverse stationary wave on a string of length l is

A. l

B. 2l

C. $\frac{l}{2}$

D. 4l

Answer: B

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72. Stading waves can be produced

(A) On a string clamed at both ends.

(B) On a string clamed at one end and free at the other.

(C) When incident wave gets reflected from a wall.

(D) When two identical waves with a phase difference of π are moving in the same direction

The correct statements are

A. A and B

B. B and C

C. A, B and C

D. All of the above

Answer: C

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73. In law of length , the fundamental frequency of vibrating string is

A. Inversely proportional to vibrating length

B. Directly proportional to the vibrating length

C. Directly proportional to the square root of vibrating length

D. Inversely proportional to square root of vibrating length

Answer: A

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74. In law of tension, the fundamental frequency of vibrating string is

A. Inversely proportional of square root of tension

B. Directly proportional to the square root of tension

C. Directly proportional to the square of tension

D. Inversely proportional to density

Answer: B

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75. In law of linear density, the fundamental frequency of vibrating string is

A. Inversely proportional to linear density of the string

B. Inversely proportional ot square root of mass per unit length of the string

C. Directly proportional to linear density of the string

D. Directly proportional to square root of lineat density of the string

Answer: B

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76. For a constant vibrating length, density of the material and tension in the string the fundamental frequency of the vibrating stringis

A. Inversely proportional to radius of the vibrating string

B. Inversely proportional to the diameter of the wire

C. Both a and b

D. Inversely proportional to the length

Answer: C

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77. The difference between two successive odd harmonics of vibrating string is equal to

A. Fundamental frequency

B. Zero overtone

C. Twice the fundamental frequency

D. a and c

Answer: C

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78. Two identical wires of different materials are stretched by the same tesion. Velocity of transverse wave in both the string is

A. Same

B. Different

C. Zero

D. Infinite

Answer: B

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79. A sitar wire is replaced by another wire of same length and material but of three times the earlier radius. If the tension in the wire remains the same, by what factor will the frequency change ?

A. Nine - times

B. Three times

C. One - third

D. One - ninth

Answer: C

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80. A sonometer wire is generally mounted over a large hollow sound box. This increases the

A. Frequency of the sound

B. Velocity of the same

C. Intensity of the sound

D. Wavelength of the sound

Answer: C

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81. A sonometer is plucked at 1/4 of its length . The most prominent would be

A. Eight

B. Fourth

C. Third

D. Second

Answer: D

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82. A brick hung a somometer wire . If the brick is immersed in oil then its frequency will

A. Increase

B. Decrease

C. Remain unchanged

D. Increases due to viscosity of oil

Answer: B

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83. To raise the pitch of a stringed musical instrument the player can

A. Loosen the string

B. Tightened the string

C. Shorten the string

D. Both b and c

Answer: D

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84. If the tension of a string is doubled, the fundamental frequency changes will be

A. Twice

B. $\sqrt{2}$ times

C. 4 times

D. 5 times

Answer: B

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85. In the fundamental mode of vibration on a stretched string, the number of antinodes are

A. One

B. Two

C. Three

D. None

Answer: A

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86. The transverse displacement of a string clamped at its both ends is given by

$y(x, t) = 0.06 \sin\left(\frac{2\pi}{3}x\right)\cos(l20\pi t)$ where x and y are in m and t in s. The length of the string is 1.5 m and its mass is 3×10^{-2} kg. The tension in the string is

A. 648 N

B. 724 N

C. 832 N

D. 980 N

Answer: A

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87. A standing wave having 3 nodes and 2 antinodes are formed between two rigid supports of length 1m. Then the wavelength of the standing wave is

A. 0.5m

B. 1.0m

C. 0.75m

D. 0.25m

Answer: B

88. In the third of vibrations of the string, the distance between extreme end nodes is 2m, then the position of the nodes from the ends will be

A. 0.667m

B. 0.333m

C. 0.50m

D. 0.25m

Answer: A

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89. Four wires of identical lengths, diameters and materials are stretched on a sonometer box. The ratio of their tension $1:4:9:16$. The ratio of their fundamental frequencies is

A. 16:9:4:1

B. 1:2:3:4

C. 4:3:2:1

D. 1:4:9:16

Answer: B

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90. A wire having a linear density $0.1kg/m$ is kept under a tension of $490N$. It is observed that it resonates at a frequency of $400Hz$. The next higher frequency is $450Hz$. Find the length of the wire.

A. 0.4m

B. 0.7m

C. 0.6m

D. 0.49m

Answer: B

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91. The speed of longitudinal waves in a thin brass rod is 3480 m/s . If the rod is clamed at one end and gives a fundamental frequency of 435 Hz, then the length of the rod will be

A. 4m

B. 2m

C. 1m

D. 0.5m

Answer: B

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92. The tension in a wire is decreased by 19% The percentage decrease in frequency will be

A. 0.81

B. 0.0019

C. 0.1

D. 0.019

Answer: C

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93. If the vibration length of a string is increased by 20% then its first overtone frequency in comparison to the original first overtone frequency will decrease by

A. 0.4

B. 0.16

C. 0.2

D. 0.32

Answer: B

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94. Two wires of the same diameter and material have length 1.2m and 2m. They emit the same fundamental frequency. If the shorter wire is stretched by a force of 36 kg wt , then the tension of longer wire will be

A. 18 kg wt

B. 100 kg wt

C. 50 kg wt

D. 72 kg wt

Answer: B

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95. A wire under a tension vibrates with fundamental frequency of 256 Hz . What should be the fundamental frequency of the wire if its length is half, thickness twice and one - fourth of the tension ?

A. 128 Hz

B. 64 Hz

C. 200 Hz

D. 96 Hz

Answer: A

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96. The speed of a transverse wave on stretched sting is 500 m/s when the tension is 2 kg wt, then the velocity of transverse waves in the same string when the tension is changed to 8 kg wt is

A. 1000 m/s

B. 250 m/s

C. 500 m/s

D. 125 m/s

Answer: A

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97. A wire having a linear density of 10^{-3} kg/m is stretched between two rigid supports. The tension in the wire is 25.6N . If the observed that the wire resonates at a frequency of 480 Hz and the next harmonic is found to be 640 Hz, then the length of the wire will be

A. 0.25m

B. 0.5m

C. 0.33m

D. 0.625m

Answer: B

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98. There are two strings of same material same diameter and length l and 2l stretched under same tension . If the strings are plucked and released, velocities of transverse waves on the two strings will be in the ratio

A. $1:2$

B. $2:1$

C. $1:\sqrt{2}$

D. $1:1$

Answer: D

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99. If the tension in a wire is decreased by 9% , then the percentage decrease in frequency will be

A. 0.1

B. 0.045

C. 0.09

D. 0.019

Answer: B

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100. A wire having a linear density of 0.05 kg/m is stretched between two rigid supports. The tension in the wire is 4.5×10^7 dyne . If the observed that the wire resonates at a frequency of 420 Hz and the next higher frequency at which the wire resonates is 490 Hz, then the length of the wire would be

A. 75 cm

B. 21.4 cm

C. 214m

D. 114m

Answer: C

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101. Two wires of radii r and $2r$ are welded together end to end . The combination is used as a sonometer wire and is kept under a tension T. The welded point lies midway between the bridges. The ratio of the number of loops formed in the wires , such that the joint is a node when the stationary waves are set up in the wire is

A. $2:1$

B. $1:2$

C. $1 : \sqrt{2}$

D. $\sqrt{2} : 1$

Answer: B

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102. A metal wire of diameter 1mm is held on two knife edges separated by a distance of 50cm . The tension in the wire is 100 N. the wire vibrates with its fundamental frequency and a vibrating tuning fork together produce 5 beat/s. The tension in the wire is the reduced to 81N. When the two are excited , beat are heard at the same rate, then the frequency of the fork will be ,

A. 45 Hz

B. 95 Hz

C. 100 Hz

D. 50 Hz

Answer: B

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103. A piano wire having a diameter of $0.90mm$ is replaced by another wire of the same material but with a diameter of $0.93mm$ .If the tension of the wire is kept the same , then the percentage change in the frequency of the fundamental tone is

A. 0.03

B. 0.003

C. $+3.2\%$

D. -3.26%

Answer: D

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104. The linear density of a vibrating string is $1.3 \times 10^{-4} kg/m$ A transverse wave is propagating on the string and is described by the equation $y = 0.021 \sin(x + 30t)$ where x and y are measured in meter and tt in second the tension in the string is :-

A. 0.48 N

B. 1.20 N

C. 0.117 N

D. 4.8 N

Answer: C

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105. The fundamental frequency of vibration of a wire fo certain length is 200 Hz. What will be the fundamental frequency of vibration, if the tension is made double and length of the wire is also doubled ?

A. 141.1 Hz

B. 200 Hz

C. 281.0 Hz

D. 400 Hz

Answer: A

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106. A string of linear density 0.2kg/m is stretched with a force of 500 N. If a transverse wave of wavelength 4m and amplitude

$(1/\pi)$ metre is travelling along it, then the speed of the wave will be

A. 50m/s

B. 62.5m/s

C. 12.5m/s

D. 250m/s

Answer: A

Watch Video Solution

107. With the data of the above problem, the frequency with which the string vibrates is

A. 50Hz

B. 12.5 Hz

C. 62.5 Hz

D. 2500 Hz

Answer: B

View Text Solution

108. If a string is stretched with a weight 4 kg then the fundamental frequency is equal to 256 Hz. What weight is needed to produce its octave?

A. 4kg wt

B. 12 kg wt

C. 16 kg wt

D. 24 kg wt

Answer: C

Watch Video Solution

109. Two wires of same material of length l and 2l vibrate with frequencies 100 Hz and 150 Hz respectively. The ratio of their tensions is

A. $2:3$

B. $3:2$

C. $1:9$

D. $1:3$

Answer: C

Watch Video Solution

110. The fundamental frequency of string stretched with a weight of 16kg is 512 Hz. The weight required to produce its octave is

A. 4 kg wt

B. 12kg wt

C. 64 kg wt

D. 24 kg wt

Answer: C

Watch Video Solution

111. 30 cm length of the wire gives note of frequency 300 Hz when plucked in the middle . What length of the wire will produce a note a frequency 400 Hz for constant tension ?

A. 15cm

B. 22.5cm

C. 45cm

D. 60cm

Answer: B

Watch Video Solution

112. The third ovetone produced by vibrating string of length 0.5m, is 1200 Hz. Then the velocity of the wave is

A. 400 m/s

B. 600 m/s

C. 300m/s

D. 1200 m/s

Answer: C

Watch Video Solution

113. If an addition of 75 kg wt to the vibrating string rises the pitch is an octave of the original pitch, then the tension in the string is

A. 50 kg wt

B. 100 gk wt

C. 75 kg wt

D. 25 kg wt

Answer: D

Watch Video Solution

114. A string of length 0.5m and linear density 10^{-4} kg/m is stretched under a tension of 100 N. If the frequency of the vibration of the string is 4000 Hz, how many loops are formed on the string?

A. 1

B. 4

C. 2

D. 6

Answer: B

Watch Video Solution

115. A string fixed at both ends is vibrating in the lowest mode of vibration for which a point at quarter of its length from one end is a point of maximum vibration . The note emitted has a frequency of $100Hz$. What will be the frequency emitted when it vibrates in the next mode such that this point is again a point of maximum vibratin ?

A. 50 Hz

B. 200 Hz

C. 100 Hz

D. 300 Hz

Answer: D

Watch Video Solution

116. A steel wire of length 1m is stretched between two rigid supports. The wire is vibrating in its fundamental mode with a frequency 100 Hz. The maximum acceleration at the mid point of the wire is 986 m/s^2 . Then the amplitude of vibration at the midpoint is

A. 25 cm

B. 0.5 cm

C. 0.25 cm

D. 50 cm

Answer: C

Watch Video Solution

117. The diameter of a stretched string is increased 3% keeping the other parameters constant then the velocity

A. 3% increases

B. 1.5% increases

C. 3% decreases

D. 1.5 Increases

Answer: C

Watch Video Solution

118. A string is taken and stretched so that it elongates by 2% . Then its fundamental frequency

A. Increase by 2%

B. Increase by 1%

C. Decrease by 2%

D. Decrease by 1%

Answer: C

Watch Video Solution

Watch Video Solution

119. The linear density of a stretched string is increased by 1%. Then the change in fundamental frequency of string is

A. Increase by 0.5%

B. Increase by 1%

C. Decrease by 0.5%

D. Decrease by 1%

Answer: C

Watch Video Solution

120. The radius of stretched sring is decreased by 1% . Then the change in fundamental frequency

A. Decrease by 1%

B. Increase by 2%

C. Increase by 1%

D. Decrease by 1%

Answer: C

Watch Video Solution

121. String B has twice the length , twice the diameter twice the tension and twice the density of string A. Then the overtone of B that will be in unison will A is

A. 1^{st}

B. 3^{rd}

C. 2^{nd}

D. 4^{th}

Answer: B

Watch Video Solution

122. A mass of 10m long wire is 100gm. If a tension of 100N is applied, what is the time taken by transverse wave to travel from one end to the other end of the wire ?

A. 0.1 s

B. 0.3 s

C. 0.2 s

D. 0.4 s

Answer: A

Watch Video Solution

123. Two stretched wires of same length, diameter and same material are in unison. Then tension in one is increased by 2% and 2 beat/s are heard . What was the frequency of the note produced when they were in unison ?

A. 400 Hz

B. 200 Hz

C. 300 Hz

D. 100 Hz

Answer: B

Watch Video Solution

124. The frequency of tuning fork A is 2% more than the frequency of a standard tuning fork. The frequency of a tuning fork B is 3% less than the frequency of the same standard tuning fork. If 6 beat/s are heard when the tuning fork A and B are excited , then frequency of A will be

A. 120Hz

B. 122.4Hz

C. 116.Hz

D. 130Hz

Answer: B

Watch Video Solution

125. The wavelength of the notes produced by two forks of frequency 256 Hz and 512 Hz, then the ratio of their wavelength is

A. $2:1$

B. $\sqrt{2}:1$

C. $1:2$

D. $1:\sqrt{2}$

Answer: A

Watch Video Solution

126. Two wires of the same diameter and material have length 1.2m and 2m. They emit the same fundamental frequency. If the shorter wire is stretched by a force of 16 kg wt , then the tension of longer wire is

A. 18 kg wt

B. 50 kg wt

C. 44.44 kg wt

D. 72 kg wt

Answer: C

Watch Video Solution

127. A wire under a tension vibrates with fundamental frequency of 256 Hz . What should be the fundamental frequency of the wire if its length is half, thickness twice and one - fourth of the tension ?

A. 128 Hz

B. 200 Hz

C. 64 Hz

D. 96 Hz

Answer: A

Watch Video Solution

128. An open pipe emits harmonics in the ratio of

A. $1:2:3$

B. $1:5:9:$

C. $1:3:5$

D. $2:4:6$

Answer: A

Watch Video Solution

129. A sonometer wire of length 100cm has a fundamental frequency of 320 Hz. Then the velocity of the transverse wave is

A. 640 m/s

B. 320 m/s

C. 160 m/s

D. 480 m/s

Answer: A

Watch Video Solution

130. The speed of a wave in a certain medium is $960m/s$. If 3600 waves pass over a certain point of the medium in 1 min, the wavelength is

A. 6m

B. 32m

C. 16m

D. 8m

Answer: C

Watch Video Solution

131. The string of monochord , vibrates 100 times a second. Its length is doubled and its tension is altered unitl it makes 150 vib/s . What is the ratio of the new tension to the string increases by a force ?

A. $1:9$

B. $9:1$

C. $1:3$

D. $3:1$

Answer: B

Watch Video Solution

132. What tension should be there in a string of length 0.8m and of mass $5 \times 10^{-3} kg$, if it vibrates with fundamental frequency of 100 Hz?

A. 100N

B. 160N

C. 140N

D. 120N

Answer: B

Watch Video Solution

133. The frequency of the note produced by a sonometer wire will be increased by 10%, if the tension is increased by

A. 0.1

B. 1

C. 0.5

D. 0.21

Answer: D

Watch Video Solution

134. The frequency of vibration of 20cm length of a sonometer wire (linear density is 0.0294 gm/cm) under a tension 3kg wt is

A. 750 Hz

B. 500 Hz

C. 250 Hz

D. 125 Hz

Answer: C

Watch Video Solution

135. The velocity of transverse wave in a stretched string is proportional to

A. T

B. m

C. T^2

D. $m^{-1/2}$

Answer: D

Watch Video Solution

136. A stretched wire 60cm long emits a fundamental frequency of 240 Hz. By how much the length should be shortened so that it emits a fundamental note of 360 Hz?

A. 40cm

B. 20cm

C. 60cm

D. 10cm

Answer: B

Watch Video Solution

137. A sonometer wire resonates with a given tuning fork forming a standing wave with five antinodes between the two bridges when a mass of $9kg$ is suspended from the wire. When this mass is replaced by a mass 'M' kg, the wire resonates with the same tuning fork forming three antinodes for the same positions of the bridges. Find the value of M.

A. 25kg

B. 5kg

C. 12.5kg

D. 1/25kg

Answer: A

Watch Video Solution

138. In an experiment with sonometer, a tuning fork of frequency 256 Hz resonates with a length of 25 cm and another tuning fork resonates with a length of 16 cm. Tension of the string remaining constant, the frequency of the second tuning fork is –

A. 163.84 Hz

B. 400Hz

C. 320Hz

D. 204.8Hz

Answer: B

Watch Video Solution

139. The tension of a stretched string is increased by 69%. In order to keep its frequency of vibration constant, its length must be increased by :

A. 0.2

B. 0.3

C. $\sqrt{69}\%$

D. 0.69

Answer: B

Watch Video Solution

140. A copper wire is held at two ends by rigid supports. At $40^\circ C$, the wire is just taut with negligible tension . The speed of transverse wave in the wie at $10^\circ C$ is

$(\alpha = 7 \times 10^{-4} / ^\circ C, y = 2.1 \times 10^{11} N / m^2, \text{density} = 9000 kg / m^3)$

A. 491m/s

B. 79m/s

C. 700m/s

D. 49.1m/s

Answer: C

Watch Video Solution

141. Two different wire A and B of same cross sectional area are joined to form a composite wire of length 1.5m of which wire A is 0.6 m and the rest is wire B. The densities of A and B are in the ratio 1:4 when the joint in the wire is a node , then the number of loops formed in A and B are in the ratio

A. $2:3$

B. $3:2$

C. $1:2$

D. $1:3$

Answer: D

Watch Video Solution

142. The linear density of a vibrating string is 2×10^{-4} kg/m. A transverse wave is propagating on the string and is described by the equation y=0.021 sin (x + 30 t) where x and y are in metre and t is in second. The tension in the string is

A. 0.18N

B. 0.12N

C. 0.021N

D. 1.8N

Answer: A

Watch Video Solution

143. In brass the velocity of longitudinal wave is 100 times the velocity of transverse wave if $Y = 1 \times 10^{11} N/m^2$, then stress in the wire is

A. $1 \times 10^{13} Nm^{-2}$

B. $1 \times 10^{9} Nm^{-2}$

C. $1 \times 10^{11} Nm^{-2}$

D. $1 \times 10^{7} Nm^{-2}$

Answer: D

Watch Video Solution

144. A metal wire is held at the two ends of rigid supports at $20^\circ C$, the wire is just . The speed of transverse wave in this wire at $25^\circ C$ will be

$$\left(\alpha = 16 \times 10^{-6} {}^\circ C^{-1}, Y = 2 \times 10^{11} N/m^2, \rho = 8000k\frac{g}{m^3}\right)$$

A. $141.4ms^{-1}$

B. $12ms^{-1}$

C. $240ms^{-1}$

D. $1200ms^{-1}$

Answer: A

Watch Video Solution

145. A string of length 10.0 m and mass 1.25kg stretched with a tension of 50N. If a transverse pulse is created at one end of the string, how long does it take to reach the other end ?

A. 0.5s

B. 1.0s

C. 1.5s

D. 2.0s

Answer: A

Watch Video Solution

146. A wire 214 cm long is to be divided into three segments which produce frequency in the ratio 5:6::7 . How should the length of the segments be

A. 80cm , 74cm , 60cm

B. 84cm , 70cm , 60cm

C. 84cm, 70cm, 64cm

D. 80cm,74cm,64cm

Answer: B

Watch Video Solution

147. A somometer wire produces 2 beats per second with a tuning fork, when the length of the wire is either 102cm or 104 cm . The frequency of the tuning fork is

A. 206 Hz

B. 204 Hz

C. 200 Hz

D. 198 Hz

Answer: A

Watch Video Solution

148. A sonometer wire is stretched by a hanging metal bob. Its fundamental frequency is n_1. When the bob is completely immersed in water, the frequency becomes n_2 . The relative density of the metal is

A. $\dfrac{n^2}{n_1^2 - n_2^2}$

B. $\dfrac{n_2^2}{n_1^2 - n_2^2}$

C. $\dfrac{n_1}{n_1 - n_2}$

D. $\dfrac{n_2}{n_1 - n_2}$

Answer: A

Watch Video Solution

149. A sonometer is set on the floor of a lift. When the lift is at rest, the sonometer wire vibrates with fundamental frequency 256 Hz. When the lift goes up with acceleration a $= \frac{9g}{16}$, the frequency of vibration of the same wire changes to

A. 512 Hz

B. 320 Hz

C. 256 Hz

D. 204 Hz

Answer: B

Watch Video Solution

150. A fork gives 5 beats with a 40cm length of sonometer wire. If the length of the wire is shortened by 1cm, the number of beats is still the same. The frequency of the fork is

A. 385 Hz

B. 320Hz

C. 395Hz

D. 400 Hz

Answer: C

Watch Video Solution

151. Two identical wires have a fundamental frequency of 100Hz, when kept under the same tension . If the tension of one of the wires is increased by 21% , the number of beats produced is

A. 11

B. 10

C. 9

D. 8

Answer: B

Watch Video Solution

152. A given length of sonometer wire is in resonance with a tuning fork. If the length of the wire is reduced by 4% the wire vibration with the fork produces 8 beats per second. The frequency of the tuning fork is

A. 200Hz

B. 192Hz

C. 208Hz

D. 196Hz

Answer: B

Watch Video Solution

153. The fundamental frequency of a sonometer wire increases by 5Hz, if the tension is increased by 21% . The fundamental frequency of the sonometer wire is a Hz is

A. 45

B. 50

C. 100

D. 55

Answer: B

Watch Video Solution

154. Length of a sonometer wire is either 95 cm or 100 cm. In both the cases a tuning fork produces 4 beats then the frequency of tuning fork is :-

A. 156

B. 152

C. 148

D. 160

Answer: A

Watch Video Solution

155. The frequency of an open pipe increases with

A. Decrease in temperature

B. The no change in temperature

C. Increase in temperature

D. Can not be predicted

Answer: C

Watch Video Solution

156. A tuning fork is excited and placed on a tube a larger booming sound is heard because of

A. Doppler's effect

B. Free vibrations

C. Resonance

D. Forced vibration

Answer: C

Watch Video Solution

Watch Video Solution

157. What is the shortest length of open organ pipe which resonates with a fundamental frequency 'n' ?

A. 21

B. v/2n

C. 41

D. v/4n

Answer: B

Watch Video Solution

158. What is the shortest length of a pipe open at one end and closed to other end resonates with the fundamental frequency n ?

A. 21

B. v/2n

C. 41

D. v/4n

Answer: D

Watch Video Solution

159. On blowing a pipe harder it produces a frequency double the fundamental frequency , the pipe is

A. Open at both ends

B. Both open and closed

C. Open at one end and closed to other end

D. Can not be predicted

Answer: A

Watch Video Solution

160. When an air column in a tube open at both the ends is set into vibration with

A. Odd harmonics are present

B. Some harmonics are present

C. All harmonic are present

D. Even harmonics are present

Answer: C

Watch Video Solution

161. When temperature of air column bounded by the tube increases , then the frequency of the vibration of air column

A. Decreases

B. Remains same

C. Increases

D. becomes zero

Answer: C

Watch Video Solution

162. The waves set up in pipes open at both the ends are

A. Longitudinal

B. Transverse

C. Longitudinal stationary

D. a and c

Answer: D

Watch Video Solution

163. An open pipe of length $2m$ is dipped in water . To what depth x is to be immersed in water so that it may resonate with a tuning fork of frequency $170Hz$ when vibrating in its overtone . Speed of sound in air is $340m/s$

A. 0.5m

B. 0.75m

C. 1m

D. 1.5m

Answer: A

Watch Video Solution

164. An organ pipe of length 0.4m is open at both ends . The speed of sound in air is $340ms^{-1}$. The fundamental frequency is

A. 400Hz

B. 425Hz

C. 450Hz

D. 475Hz

Answer: B

Watch Video Solution

165. n_1 and n_2 are the fundamental frequency of two open pipes of same diameter . If these two are joined end to end to form as single pipe, the fundamental frequency of the new pipe formed is

A. $n_1 + n_2$

B. $\frac{n_1 + n_2}{2}$

C. $\frac{n_1 n_2}{n_1 + n_2}$

D. $\frac{n_1 + n_2}{n_1 n_2}$

Answer: C

Watch Video Solution

166. An organ pipe P_1 open at one end vibrating in its first harmonic and another pipe P_2 open at ends vibrating in its third

harmonic are in resonance with a given tuning fork. The ratio of the length of P_1 to that P_2 is

A. $6:1$

B. $2:3$

C. $1:6$

D. $3:2$

Answer: C

Watch Video Solution

167. A long glass tube is held vertically in water. A tuning fork is struck and held over the tube. Strong resonances are observed at two successive lengths $0.50m$ and $0.84m$ above the surface of water. If the velocity of sound is $340m/s$, then the frequency of the tuning fork is

A. 128Hz

B. 256Hz

C. 284Hz

D. 500Hz

Answer: D

Watch Video Solution

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

A. Increase

B. Decrease

C. Remain constant

D. None of these

Answer: A

Watch Video Solution

169. A tuning fork of frequency $500 H_Z$ is sounded on a resonance tube . The first and second resonances are obtined at $17 cm$ and $52 cm$. The velocity of sound is

A. 350 m/s

B. 520 m/s

C. 700 m/s

D. 170 m/s

Answer: A

Watch Video Solution

170. An open pipe resonates to a frequency n_1 and closed pipe to a frequency n_2. If they are joined to form a longer closed pipes , then its fundamental frequency of resonance will be

A. $\frac{n_1 n_2}{2n_2 + n_1}$

B. $\frac{2n_2 n_1}{2n_2 + n_1}$

C. $\frac{2n_2 n_1}{n_1 + n_2}$

D. $\frac{n_2 + 2n_1}{n_1 n_2}$

Answer: A

Watch Video Solution

171. A cylinderical tube open at both ends, has a fundamental frequency f in air. The tube is dipped vertically in water so that half of it is in water. The fundamental frequency of air column is now

A. n/2

B. n

C. 2n

D. 4n

Answer: B

Watch Video Solution

172. A closed pipe has certain frequency. Now its length is halved. Considering the end correction, its frequency will now become

A. Double

B. More than double

C. Less than double

D. Four time

Answer: C

Watch Video Solution

173. The two organ pipes of same length and material, but of different radii. The loss of sound will be

A. More from a wider pipe

B. More from a narrow pipe

C. Same for both

D. None of these

Answer: A

Watch Video Solution

174. A closed organ pipe has a frequency $'n'$. If its length is doubled and radius is halved , its frequency nearly becomes .

A. n/2

B. n/3

C. n

D. 2n

Answer: A

Watch Video Solution

175. Two organ pipes produce 5 beat/s at $10^\circ C$. When the temperature rises to $20^\circ C$ then the number of beats produce will be

A. 5

B. More than 5

C. Less than 5

D. Depends upon length of pipes

Answer: B

Watch Video Solution

176. The end correction for the vibrations of air column in a tube of circular cross section will be more , if the tube is

A. Made thinner

B. Widened

C. Made shorter

D. Made longer

Answer: B

Watch Video Solution

177. An open organ pipe of length L vibrates in its fundamental mode. The pressure variation is maximum

A. The two ends

B. Middle of pipe

C. Distance l/4 inside the ends

D. The distance l/8 inside the ends

Answer: B

Watch Video Solution

178. The room temperature charges by a small amount from T to $T + \Delta T$ (on Kelvin scale). The fundamental frequency of organ pipe changes from f to $f + \Delta f$, then

A. $\frac{\Delta T}{T}$

B. $\frac{1}{2}\frac{\Delta T}{T}$

C. $2\frac{\Delta T}{T}$

D. $\frac{-\Delta T}{T}$

Answer: B

Watch Video Solution

179. Flute is an example of

A. A pipe open at one end and closed to other end

B. Pipe open at both the ends

C. A pipe closed at one end

D. Neither a and b

Answer: B

Watch Video Solution

180. The lengths of two organ pipes open at both ends are L and $L+d$. If they are sounde together, then the beat frequency will be

A. $\dfrac{YV}{2l(l+y)}$

B. $\dfrac{YV}{2l^2}$

C. $\dfrac{YV}{2l^2(l+y)}$

D. $\dfrac{2l^2}{YV}$

Answer: A

Watch Video Solution

181. Two closed organ pipes have lengths L and $L + X$. When two pipes are sounded together , the beat frequency is

A. $\frac{YV}{4l(l+y)}$

B. $\frac{YV}{2l(l+y)}$

C. $\frac{YV}{2l^2(l+y)}$

D. $\frac{2l^2}{YV}$

Answer: A

Watch Video Solution

182. If oil of density higher than that of water is used in place of water in a resonance tube its frequency will be

A. Decrease

B. Increase

C. Remain constant

D. Can not be predicted

Answer: C

Watch Video Solution

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

A. Decrease

B. Increase

C. Remain the same

D. Can not be predicted

Answer: D

Watch Video Solution

184. Water is slowly drained out in a cylindrical tube then the fundamental frequency of vibration of the column will be

A. Continuously decreases

B. Continuously increases

C. Remain same

D. First increases, later on decreases

Answer: A

Watch Video Solution

185. Melodious sound is in

A. A closed organ pipe

B. Kundt's tube

C. A open organ pipe

D. All of the above

Answer: C

Watch Video Solution

186. In resonance tube experiment, first resonance occurs for the length of air - column equal to 25 cm with a tuning fork of frequency 340 Hz. If the length of the air column is decreased by 1cm , the frequency of beats will be

A. 28Hz

B. 7Hz

C. 14Hz

D. 9Hz

Answer: C

Watch Video Solution

187. Two tuning forks n_1 and n_2 when sounded together produces 5 beats per second . If the fork n_1 is in resonance with a closed tube of length 8cm and other n_2 is resonance with an open tube of length 16.5cm the frequency n_1 will be

A. 165Hz

B. 140Hz

C. 140Hz

D. 145Hz

Answer: A

Watch Video Solution

188. If the end correction of an open tube is 0.3 cm, then the diameter of the tube will be

A. 1cm

B. 0.3cm

C. 0.5cm

D. 3cm

Answer: C

Watch Video Solution

189. The fundamental frequency of an open and closed organ pipe of the same length is in the ratio

A. $2:1$

B. $1/2:2$

C. $1:2$

D. $2:1/2$

Answer: A

Watch Video Solution

Watch Video Solution

190. A pipe produces notes of frequencies 300Hz, 600Hz, 900 Hz , the pipe is

A. Open at one end

B. Open at both the ends

C. a and b

D. Kund's tube

Answer: B

Watch Video Solution

191. Two air columns producing their fundamental notes , give rise to 3 beat/s . If the air column vibrates in third harmonics , then the number of beat/s will be

A. 3

B. 9

C. 6

D. 7

Answer: B

Watch Video Solution

192. An open organ pipe of length is 50 cm, if the velocity of sound in air is 320m/s , then the frequency of its fundamental note will be

A. 160Hz

B. 480Hz

C. 320Hz

D. 640Hz

Answer: C

Watch Video Solution

193. If the length of the closed pipe whose fundamental frequency is equal to that of open pipe of length 60cm will be

A. 20cm

B. 24cm

C. 28cm

D. 30cm

Answer: D

Watch Video Solution

194. An open pipe resonates to a fundamental frequency 300 Hz and closed pipe to a fundamental frequency 150Hz. If they are joined to form a longer closed tube, then the fundamental frequency of resonance will be

A. 72Hz

B. 75Hz

C. 45Hz

D. 47Hz

Answer: B

Watch Video Solution

195. The end correction of the open pipe is

A. 0.3d

B. 0.6d

C. $(l_2 - 3l_1)/2$

D. Both a and b

Answer: B

Watch Video Solution

196. The sequence of harmonics of a pipe open at one end and closed to the other end are 250Hz and 350Hz . If the velocity of sound in air is 340m/s, then the resonating length of the air column in its fundamental mode will be

A. 17.0m

B. 1.70m

C. 3.4m

D. 34m

Answer: B

Watch Video Solution

197. If the speed of sound in air is 320m/s, then the fundamental frequency of an closed pipe of length 50cm , will be

A. 320Hz

B. 160Hz

C. 640Hz

D. 960Hz

Answer: B

Watch Video Solution

Watch Video Solution

198. The fundamental frequency of an open organ pipe is 300Hz. The first overtone of this has same frequency as that of first overtone of a closed organ pipe. If speed of sound is 330m/s, then the length of closed of organ pipe will be

A. 41cm

B. 37cm

C. 31cm

D. 80cm

Answer: A

Watch Video Solution

199. What will be the length of the closed pipe of produce resonance with sound waves of wavelength 66cm ?

A. 33cm

B. 16.5cm

C. 37cm

D. 48cm

Answer: B

Watch Video Solution

200. When an open is producing third harmonic mode, then number of modes will be

A. 1

B. 2

C. 3

D. 4

Answer: C

Watch Video Solution

201. Two organ pipes, each closed at one end, give 5 beats s^{-1} when emitting their fundamental notes. If their lengths are in the ratio $50 : 51$, their fundamental frequencies are

A. 250, 255

B. 255, 260

C. 260, 265

D. 265, 270

Answer: A

Watch Video Solution

202. A cylindrical tube containing air is open at both ends. If the shortest length of the tube for a resonance with a fork is 20cm, the next shortest length for resonance with the same fork will be

A. 60cm

B. 40cm

C. 90cm

D. 80cm

Answer: B

Watch Video Solution

203. A pipe closed at one end produces a fundamental note of frequency 412 Hz. If it is cut into two pieces of equal lengths , then the fundamental frequencies produced by the two pieces would be

A. 206Hz, 412Hz

B. 824Hz, 1684Hz

C. 412Hz, 824Hz

D. 206Hz, 824Hz

Answer: B

Watch Video Solution

204. A fork of frequency 256Hz resonates with a closed organ pipe of length 25.4cm. If the length of the pipe is increased by 2mm then the number of beat/s will be

A. 4

B. 1

C. 2

D. 3

Answer: C

Watch Video Solution

205. A tuning fork of frequency n resonates with a closed organ pipe when the length of the shortest air columns are a and b respectively, then the speed of sound in air will be

A. n(a-b)

B. $\frac{n(b-a)}{2}$

C. $2n(b+a)$

D. 2n(b-a)

Answer: D

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206. An open organ pipe has fundamental frequency 100 Hz. What frequency will be produced if its one end is closed ?

A. 100, 200, 300

B. 50, 150, 250

C. 50, 100, 200, 300

D. 50, 100, 150

Answer: B

Watch Video Solution

207. 5 beat/s are produced on blowing together two closed organ pipes of the same diameter but of different lengths. If shorter pipe of length 10cm and speed of sound in air 300m/s , then the length of longer pipe , will be

A. 10.06cm

B. 11.22cm

C. 15cm

D. 30cm

Answer: A

Watch Video Solution

208. In an air column , resonances occurs at 25cm and 77cm. If the frequency of the fork is 325 Hz, then the velocity of sound in air will be

A. 364 m/s

B. 357 m/s

C. 338 m/s

D. 346 m/s

Answer: C

Watch Video Solution

209. In the above problem, end correction is

A. 1cm

B. 0.5cm

C. 4cm

D. 2cm

Answer: A

View Text Solution

210. A closed organ pipe has fundamental frequency 100Hz. What frequencies will be produced, if its other ends is also opend ?

A. 200, 400, 600....

B. 200, 300, 400, 500....

C. 100, 300, 500, 700......

D. 100, 200, 300, 400....

Answer: A

Watch Video Solution

211. What will be the lowest resonance frequencies produced in an open pipe of effective length 0.68 m ? (Velocity of sound in air =340m/s)

A. 125 , 325 Hz

B. 250, 500 Hz

C. 125, 250 Hz

D. 250, 750Hz

Answer: B

Watch Video Solution

212. Air is blown at the mouth of a tube of length 25 cm and diameter equal to 2 cm open at both ends. If velocity of sound in air is $330ms^{-1}$, the sound emitted will have all the frequencies in the group

A. 330, 990, 1690 Hz

B. 302, 664, 1320 Hz

C. 660, 1320, 1980Hz

D. 660 , 1000 , 3300 Hz

Answer: C

Watch Video Solution

213. If an air column of length 5cm resonates with a stretched string of length 40cm, then the length of the same air column which will resonates with 60cm of the same string at the same tension will be

A. 100cm

B. 75cm

C. 50cm

D. 48cm

Answer: B

Watch Video Solution

214. In a resonance tube experiment, the first resonance is obtained when the level of water in the tube is at 26cm from the open ened. Then the next resonance may be obtained , when the level of water will be

A. 32cm

B. 48cm

C. 47cm

D. 80cm

Answer: D

Watch Video Solution

215. If the frequency of the first overtone of a closed organ pipe of length 33cm is equal to the frequency of the first overtone of an organ pipe, then the length of the open organ pipe will be

A. 33cm

B. 22cm

C. 44cm

D. 88cm

Answer: C

Watch Video Solution

216. Two tuning forks A and B gives 6 beat/s. The fork A resonates with a closed end air column of length 15cm and the fork B with an open air column of length 30.5cm . If the air in both the cases vibrates in the air fundamental modes, then the frequencies of fork A and B will be

A. 354 and 360Hz

B. 366 and 360Hz

C. 360 and 354 Hz

D. 360 and

Answer: B

Watch Video Solution

217. A closed organ pipe and an open organ pipe have their first overtones identical in frequency . Their lenghts are in the ratio

A. $1:2$

B. $2:3$

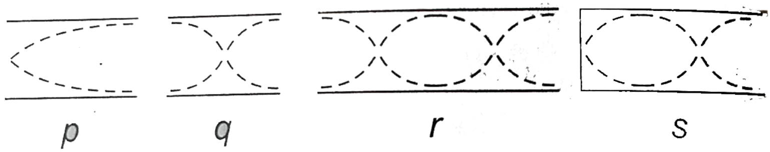
C. $3:4$

D. $4:5$

Answer: C

Watch Video Solution

218. The vibrations of four air columns are represented in the adjoining figures. The ratio of frequencies $n_p : n_q : n_r : n_s$ is



A. $12:6:3:4$

B. $1:2:4:3$

C. $4:2:3:1$

D. $6:2:3:4$

Answer: B

Watch Video Solution

219. An organ pipe P_1 closed at one vibrating in its first overtone and another pipe P_2. Open at both ends vibrating in third overtone are in resonance with a given tuning fork. The ratio of the length of P_1 to that of P_2 is

A. $8/3$

B. $3/8$

C. $1/2$

D. $3/2$

Answer: B

Watch Video Solution

220. If an open pipe is suddenly closed with the result that the second overtone of the closed pipe is found to be higher in frequency by 100 Hz than the first overtone of the original pipe, then the fundamental frequency of open pipe will be

A. 100Hz

B. 300Hz

C. 150Hz

D. 200Hz

Answer: D

Watch Video Solution

221. The fundamental frequency of an open end pipe is 300 Hz, when air is at a temperature of $27^{\circ} C$. If the temperature increases to $29^{\circ} C$, then the frequency becomes

A. 299 Hz

B. 300 Hz

C. 301 Hz

D. 302 Hz

Answer: C

Watch Video Solution

222. The first obertone of an open organ pipe beats with the first overtone of a closed organ pipe with a beat frequency of 2.2 Hz. The fudamental frequency of clos3ed organ pipe is 110 Hz. Find length of the open pipe. (Given, sound in air =330 m/s)

A. 1.0067m only

B. 0.9937m only

C. 1.0067 or 0.9937m

D. 0.75m

Answer: C

Watch Video Solution

223. The length of a given open end and closed end pipes are l_0 and l_c respectively. If both the pipes emit same fundamental notes, then the ratio l_0/l_c is

A. $\sqrt{2}:1$

B. $2:1$

C. $1:2$

D. $1:\sqrt{2}$

Answer: B

Watch Video Solution

224. For a certain organ pipe , three successive resonance frequencies are observed at 255 Hz, 425Hz, 595Hz respectively, then the pipe is

A. A pipe closed at one end with fundamental frequency 85 Hz

B. Closed at one end with fundamental frequency 255Hz

C. Open at both the ends with fundamental frequency 85Hz

D. Open at both the ends with fundamental frequency 255Hz

Answer: A

Watch Video Solution

225. For a certain organ pipe , three successive resonance frequencies are observed at 170 Hz, 255Hz, 340Hz respectively, then the pipe is

A. Open end pipe with fundamental frequency 85Hz

B. Open end pipe with fundamental frequency 170Hz

C. Closed at one end pipe with fundamental frequency 85Hz

D. Closed at one end pipe with fundamental frequency 170 Hz

Answer: A

Watch Video Solution

226. A glass tube of $1.0m$ length is filled with water . The water can be drained out slowly at the bottom of the tube . If a vibrating tuning fork of frequency $500c/s$ is brought at the upper end of the tube and the velocity of sound is $330m/s$, then the total number of resonances obtained will be

A. 4

B. 3

C. 2

D. 1

Answer: B

Watch Video Solution

227. A pipe closed at one end open at the other end, resonates with sound waves of frequency 135 Hz and also 165 Hz, but not with any wave of frequency intermediate between these two. Then, the frequency of the fundamental note is

A. 30Hz

B. 15Hz

C. 60Hz

D. 7.5Hz

Answer: B

Watch Video Solution

228. A pipe of length 2cm is open at both the ends which harmonic mode of the pipe is resonantly excited by a source of frequency 425Hz ? (Speed of sound v= 340m/s)

A. First harmonic

B. Second harmonic

C. Third harmonic

D. Fourth harmonic

Answer: B

Watch Video Solution

229. The frequency of third overtone of a pipe closed at one end , is in unison with the fifth overtone of a pipe open at both the ends. Then the ratio of length of the pipe closed at one end to the open at both the ends is

A. $7/12$

B. $12/7$

C. $5/12$

D. $24/7$

Answer: A

Watch Video Solution

230. If the two tubes of lengths 50cm and 51cm closed at one end produce 7 beats in two second, when sounded to their fundamental notes neglecting end correction , then velocity of sound in air will be

A. 350m/s

B. 352m/s

C. 354m/s

D. 357m/s

Answer: D

Watch Video Solution

231. A tuning fork of frequency 340Hz vibrated above a cylindrical hallow tube closed at one end. The height of the tube is 120cm .

Water is slowly poured in it. What is the minimum height of water required for resonance ?

A. 95cm

B. 25cm

C. 45cm

D. 105cm

Answer: C

Watch Video Solution

232. A tuning fork of frequency 340Hz is vibrated above a cylindrical hallow tube closed at one end . Poured in it. What is the maximum height of water required for resonance ?

A. 95cm

B. 25cm

C. 45cm

D. 105cm

Answer: A

Watch Video Solution

233. The time required for the sound wave to reach up to the closed end of a pipe filled with air medium is 0.02s. What will be the frequency of vibration of air column ?

A. 20Hz

B. 12.5Hz

C. 10Hz

D. 15Hz

Answer: B

Watch Video Solution

234. The value of end correction for the pipe open at both the ends is a

(If the d is the inner diameter of the tube and r is the radius of the tube .)

A. e=0.6d

B. e=1.2r

C. Both a and b

D. Neither a nor b

Answer: C

Watch Video Solution

235. Two successive resonance frequencies in an open organ pipe are 1944 Hz and 2592 Hz. Find the length of the tube. The speed of sound in air is $324ms^{-1}$.

A. 25cm

B. 100cm

C. 50cm

D. 12.5cm

Answer: A

Watch Video Solution

236. Stationary waves are setup in an air column. Velocity of sound in air is $330ms^{-1}$ and frequency is $165Hz$. The distance between two successive nodes is

A. 2m

B. 1m

C. 0.5m

D. 4m

Answer: B

Watch Video Solution

237. Stationary waves are setup in an air column. Velocity of sound in air is $330 ms^{-1}$ and frequency is $165 Hz$. The distance between two successive nodes is

A. 2m

B. 1m

C. 0.5m

D. 4m

Answer: B

Watch Video Solution

238. Two similar organ pipes when sounded together produce 7 beat/s, if their lengths are in the ratio 50:51 , then their frequency are in the ratio

A. $50 : 51$

B. $51 : 50$

C. $25 : 24$

D. $1 : 4$

Answer: B

Watch Video Solution

239. Second overtone of a closed pipe of length , 1m is in unison with third overtone of an open pipe , then the length of the open pipe will be

A. 1.6 m

B. 0.625 m

C. 0.8 m

D. 3.2 m

Answer: A

Watch Video Solution

240. The minimum length of a pipe closed at one end is 18cm, when a tuning fork of 480 Hz is used. If the inner diameter of the tube is 3.34 cm, then the velocity of sound in air will be nearly

A. 350m/s

B. 640m/s

C. 340m/s

D. 365m/s

Answer: D

Watch Video Solution

241. A pipe 30 cm long is open at both ends. Which harmonic mode of the pipe is resonantly excited by a 1.1 kHz source ? (Take speed of sound in air $= 330ms^{-1}$)

A. 1

B. 3

C. 2

D. 4

Answer: C

Watch Video Solution

242. If pipe open at both the ends has an effective length of 0.5m, then the frequency of the note which is octave its fundamental frequency will be (Velocity of sound in air is 340m/s)

A. 170Hz

B. 340Hz

C. 510Hz

D. 680Hz

Answer: D

Watch Video Solution

243. The maximum number of overtones emitted by an open organ pipe of length 15cm that can be heard by a person with normal hearing (velocity of sound in air is 330m/s) will be

A. 16

B. 17

C. 18

D. 19

Answer: B

Watch Video Solution

244. An open organ pipe of length L vibrates in its fundamental mode. The pressure variation is maximum

A. Two ends

B. Middle of the pipe

C. Distance L/4 inside

D. Distance L/8 inside

Answer: B

Watch Video Solution

245. An air column closed at one end and resonates with tuning fork of frequency n when its lengths are 45cm and 99cm and other length in between these values the wavelength of sound in the air column is

A. 180cm

B. 108cm

C. 54cm

D. 36cm

Answer: C

Watch Video Solution

246. Two organ pipes give 4 beat/s when sounded together at $27^\circ C$, then the number of beat/s at $127^\circ C$ will be

A. 4.8

B. 4.6

C. 4

D. 5

Answer: B

Watch Video Solution

247. Frequency of an open organ pipe is 300 Hz. The first overtone of this pipe is same as the first overtone of closed organ pipe. What is the length of closed organ pipe ? (Speed of sound is 336m/s.)

A. 11cm

B. 42cm

C. 21cm

D. 84cm

Answer: B

Watch Video Solution

248. A glass tube of length 1m is filled with water . The water can be drained out slowly at the bottom of the tube . If a vibrating tuning fork of frequency 250Hz is brought at the upper end of the tube and the velocity of sound is 330 m/s , then the total number of resonance obtained will be

A. 4

B. 3

C. 2

D. 1

Answer: D

Watch Video Solution

249. A cylindrical pipe of length 29.5cm closed at one end is found to be in resonance when a tuning fork of frequency 864Hz is sounded near the open end. Then the mode of vibration of the air in the pipe is (Velocity of sound in air is 340m/s.)

A. 2

B. 4

C. 3

D. 5

Answer: C

Watch Video Solution

250. The fundamental frequency of an open pipe of length 34cm and how many harmonics may be heard by a person having normal hearing ?

A. 100Hz, 10

B. 300 Hz, 30

C. 200 Hz, 20

D. 500 Hz, 40

Answer: D

Watch Video Solution

251. When an open pipe is vertically dipped in water 8cm is inside the water, then the fundamental frequency of air column is 400Hz. If it is 6cm inside the water then fundamental frequency of the air column is 300Hz. Then the length of the tube will be

A. 22cm

B. 14cm

C. 20cm

D. 16cm

Answer: B

Watch Video Solution

252. Two closed organ pipes give 10 beats between the fundamental when sounded together. If the length of the shorter pipe is $1m$ then the length of the longer pipe will be (speed of sound in air is $340ms^{-1}$)

A. 2.87m

B. 1.13m

C. 0.87m

D. 2.13m

Answer: B

Watch Video Solution

253. The length of pipe 4cm in diameter and open at both ends when it is set into vibrations by a tuning fork of frequency 288Hz. (v=332m/s)

A. 85.23cm

B. 75.23cm

C. 65.23cm

D. 55.23cm

Answer: D

Watch Video Solution

254. The harmonics which are present in a pipe open at one end are

A. Odd harmonics

B. Even harmonics

C. Even as well as odd harmonics

D. None of these

Answer: A

Watch Video Solution

255. An open tube resonates to a frequency of 156 Hz. When it is dipper so that $(1/4)^{th}$ of its length is under water , to what frequency does it resonate ?

A. 150.6Hz

B. 160.6Hz

C. 170.6Hz

D. 180.6Hz

Answer: C

Watch Video Solution

256. Fundamental frequency of pipe is 100 Hz and other two frequencies are 300 Hz and 500 Hz then

A. Pipe is open at both the ends

B. Pipe is closed at both the ends

C. One end open and another end is closed

D. None of the above

Answer: C

Watch Video Solution

257. An open tube is in resonance with string (frequency of vibration of tube is n 0). If tube is dipped in water so that 75% of length of tube is inside water, then the ratio of the frequency of tube to string now will be

A. 1

B. 2

C. $\frac{2}{3}$

D. $\frac{3}{2}$

Answer: B

Watch Video Solution

258. A body is set into vibrations with a strong external force, the vibration is

A. Free vibration

B. Resonant vibration

C. Forced vibration

D. Damped vibrations

Answer: C

Watch Video Solution

259. In forced vibration, the body vibrates with the

A. Same frequency of external force

B. Different frequency of external force

C. Exactly half of external force frequency

D. Same and different frequencies of external force frequency

Answer: A

Watch Video Solution

260. In forced vibration , amplitude

A. Changes continuously

B. Remains constant

C. First decreases gradually and finally becomes zero

D. Changes irregularity

Answer: B

Watch Video Solution

261. In freee vibrations, the body vibrates with

A. Frequency of external force

B. Its own natural frequency

C. Exactly equal to half to the external force

D. Nothing can be said

Answer: B

Watch Video Solution

262. The integral multiple of fundamental frequencies are

A. Harmonics

B. Resonance

C. Overtones

D. Forced vibration

Answer: A

Watch Video Solution

263. The integral multiple of fundamental frequencies . Which are actully present in the sound is

A. Harmonics

B. Resonance

C. Overtones

D. Forced vibration

Answer: C

Watch Video Solution

264. In resonance , the frequency of a body is

A. Greater than external periodic force frequency

B. Less than external periodic force frequency

C. Exactly equal to external periodic force frequency

D. Can not be predicted

Answer: C

Watch Video Solution

265. At resonance, the amplitude of forced oscillations is

A. Minimum

B. Equal to amplitude of periodic force

C. Maximum

D. Can not be predicted

Answer: C

Watch Video Solution

266. The harmonics that accompanied with the fundamental frequency of a vibrating stretched string are

A. All harmonics

B. Odd harmonics

C. Even harmonics

D. Multiple of three

Answer: A

Watch Video Solution

267. In resonance

A. The energy released by the vibrating body is maximum

B. Energy absorbed by the vibrating body is maximum

C. Neither energy absorbed by the vibrating body nor energy released

D. Can not be predicted

Answer: B

Watch Video Solution

268. In free vibrations, energy

A. Changes continuously

B. Remains constant

C. Gradually decreases with time

D. a and c

Answer: C

Watch Video Solution

269. 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. Second

B. Fourth

C. Third

D. Eighth

Answer: A

Watch Video Solution

270. The natural frequency of the body depends upon

A. Dimensions and elastic property of the body

B. Only on the dimension of the vibrating body s

C. Elastic property of the body only

D. Can not be predicted

Answer: A

Watch Video Solution

271. The frequency of natural vibrations of a body is determined by

A. Elasticity of body

B. Inertia

C. Both elasticity and inertia

D. None of these

Answer: C

Watch Video Solution

272. The frequency of vibration of due to elasticity are independent of

A. Modulus of elasticity

B. Restoring force

C. Amplitude

D. None of the above

Answer: C

Watch Video Solution

273. Resonance takes place when the applied frequency is .... the natural frequency of the system

A. Greater than

B. Less than

C. Equal to

D. Either a or b depending on system

Answer: C

Watch Video Solution

274. The acceleration of body executing free damping vibration is

A. Constant

B. Changes

C. Increasing

D. Decreasing

Answer: D

Watch Video Solution

275. The physical quantity that remains constant during damped vibrations

A. Frequency

B. Angular frequency

C. Frictional froce initial phase

D.

Answer: D

Watch Video Solution

276. The cause of damping in an oscillatory motion is

A. Restoring force

B. Friction

C. Both

D. None of these

Answer: B

Watch Video Solution

277. Resonance is a special case of

A. Forced oscillations

B. Damped oscillations

C. Free oscillations

D. Natural oscillations

Answer: A

Watch Video Solution

278. The phenomenon of setting a body into vibrations by a strong periodic force is called

A. Free vibration

B. Forced vibrations

C. Resonant vibrations

D. None of these

Answer: B

Watch Video Solution

279. In a sonometer , the waves produced are

A. Longitudinal

B. Transverse progressive

C. Transverse stationary and polarised

D. Transverse, stationary and unpolarised

Answer: C

Watch Video Solution

280. Sonometer is based on the principle of

A. Forced vibration

B. Free vibrations

C. Resonance

D. All of the above

Answer: C

Watch Video Solution

281. Sonometer is used

A. To determine the frequency of tuning fork

B. To verify the laws of vibrating string

C. To determine the velocity of longitudinal waves

D. Both a and b

Answer: D

Watch Video Solution

282. A wire is under tension and emitting its fundamental frequency . If the wire is replaced by another wire of the same material and same tension but it is thicker , then the fundamental frequency of vibration will

A. Same

B. Decrease

C. Increase

D. Can not be predicted

Answer: B

Watch Video Solution

283. Monocord is based on the principle of

A. Resonance

B. Forced vibrations

C. Free vibration

D. All of these

Answer: A

Watch Video Solution

284. If the sonometer wire is vibrating in the second overtone, then there will be formation of

A. Two nodes and two antinode

B. One node and two antinode

C. Four nodes and three antinodes

D. Three nodes and three antinodes

Answer: C

Watch Video Solution

285. A sonometer wire of density ρ and radius r is held between two bridges at a distance L apart . Tension in the wire is T. then the fundamental frequency of the wire will be

A. $n = \frac{1}{2L}\sqrt{\pi r^2 / T\rho}$

B. $n = \frac{1}{2L}\sqrt{T / \pi r^2}$

C. $n = \frac{1}{2L}\sqrt{\rho T / \pi r^2}$

D. $n = \frac{1}{2L}\sqrt{T / \pi r^2 \rho}$

Answer: D

Watch Video Solution

286. A stretched sonometer wire is in unison with a tuning fork. When the length of the wire is decreased by 1% 6 beats/s are heard, then the frequency of the tuning fork is

A. 594 Hz

B. 606 Hz

C. 600 Hz

D. 612 Hz

Answer: A

Watch Video Solution

287. The tension in a sonometer wire is increased to nine times. Then the fundamental frequency of the wire is

A. 9 times

B. 3 times

C. 1/3 times

D. 1/9 times

Answer: B

Watch Video Solution

288. A sonometer wire , $100cm$ in length has fundamental frequency of $330Hz$. The velocity of propagation of tranverse waves along the wire is

A. 330 m/s

B. 660 m/s

C. 990 m/s

D. 115 m/s

Answer: B

Watch Video Solution

289. A tuning fork of frequency 1024 Hz is used to produce vibrations on a sonometer wire of natural frequency 256 Hz. Then the wire will vibrate in

A. First mode

B. Second mode

C. Fourth mode

D. Third mode

Answer: C

Watch Video Solution

290. Tension applied to a wire of length 1m and its mass 1g, if it is to vibrate with the fundamental frequency of 50 Hz, will be

A. 100N

B. 10N

C. 50N

D. 2.5N

Answer: B

Watch Video Solution

291. A wire of length 20cm is stretched by a load of 1kg wt. if the linear density of the wire is 0.01 gm/cm, then the speed of the transverse waves on the wire will be

A. 99 m/s

B. 3.13m/s

C. 9.8m/s

D. 10m/s

Answer: A

Watch Video Solution

292. The length of the stretched sonometer wire is 1m, if the fundamental frequency are in the ratio 1:2 . Where should be the bridge be placed to divide the wire two segments ?

A. $\frac{1}{3}:\frac{2}{3}$

B. $\frac{2}{3}:\frac{1}{3}$

C. $\frac{3}{2}:3$

D. $2:3$

Answer: B

Watch Video Solution

293. If a sonometer wire of length 110 cm fixed horizontally under a constant tension, then the bridge be placed below the wire so that the two segments can emits note whose frequency are in the ratio 3:2, is

A. 44cm and 66 cm

B. 66 cm and 44cm

C. 25cm and 75cm

D. 41.5 cm and 58.5 cm

Answer: A

Watch Video Solution

294. The length of a sonometer wire between two fixed ends is 110cm. Where should the two bridges the placed so as to divide the wire into three segments, whose fundamental frequencies are in the ration$1:2:3$?

A. 60cm, 30cm and 20cm

B. 20cm, 30cm and 60cm

C. 30cm, 20cm and 60cm

D. 60cm, 20cm and 30cm

Answer: A

Watch Video Solution

295. If a tuning produces 5 beat/s with a sonometer wire of lengths 40cm and 44cm , other factor remaining unchanged, then the frequency of the tuning fork will be

A. 80Hz

B. 88Hz

C. 100Hz

D. 105Hz

Answer: D

Watch Video Solution

296. A stretched sonometer wire is in unison with a tuning fork. When length of wire is increase by 1%, the number of beats heard per second is 5. then, the frequency of the fork is

A. 500 Hz

B. 505 Hz

C. 255 Hz

D. 250 Hz

Answer: B

Watch Video Solution

297. A tuning fork of frequency 200Hz is in unison with a sonometer wire . The number of beats heard per second when the tension is increased by 1% will be

A. 1

B. 2

C. 4

D. 0.5

Answer: A

Watch Video Solution

298. A sonometer wire is in unison with a tuning fork. When the length of the wire is increased by 2% , the number of beats heard per second is 5, then the frequency of the fork will be

A. 245Hz

B. 250Hz

C. 255Hz

D. 260Hz

Answer: C

Watch Video Solution

299. A knife edge divides a sonometer wire in two parts which differ in length by 2mm. The length of the wire is 1m. The two parts of the string when sounded together produce on beat per second, then the frequency of the smaller and the longer parts of the wire in Hz will be

A. 250.5 and 249.5

B. 249.5 and 250.5

C. 124.5 and 125.4

D. 125.4 and 124.5

Answer: A

Watch Video Solution

300. A stone in hung in air from a wire which is stretched over a sonometer . The bridges of the sonometer are $40cm$ apart when the wire is in unison with a tuning fork of frequency $256Hz$. When the stone is completely immersed in water , the length between the bridges is $22cm$ for re - establishing unison . The specific gravity of the material of the stone is

A. 0.767

B. 1.38

C. 0.983

D. 9.23

Answer: B

Watch Video Solution

301. Frequency of a sonometer wire is n. Now its tension is increased 4 times and its length is doubled then new frequency will be

A. n/2

B. n

C. 2n

D. 4n

Answer: B

Watch Video Solution

302. When the string of the sonometer of length l between the bridges vibrates in the first overtone, then the antinode formed from one end of the string will be

A. $\frac{\lambda}{2}$

B. $\frac{\lambda}{4}$ and $\frac{3\lambda}{4}$

C. $\frac{\lambda}{6}, \frac{3\lambda}{6}$ and $\frac{5\lambda}{6}$

D. $\frac{\lambda}{8}, \frac{3\lambda}{8}$ and $\frac{7\lambda}{8}$

Answer: B

Watch Video Solution

303. Length of a sonometer wire is either 95 cm or 100 cm. In both the cases a tuning fork produces 4 beats then the frequency of tuning fork is :-

A. 156Hz

B. 148Hz

C. 152Hz

D. 160Hz

Answer: A

Watch Video Solution

304. Two wires made up of the same material are of equal lengths but their diameter are in the ratio 1:2 . On stretching each of these two strings by the same tension , then the ratio of the fundamental frequency of these strings is

A. $1:4$

B. $1:2$

C. $2:1$

D. $4:1$

Answer: C

Watch Video Solution

305. A sonometer wire of length 114 cm is fixed at both the ends. Where should the two bridges be placed so as to divide the wire into three segments whose fundamental frequencies are in the ratio $1:3:4$?

A. 24cm and 72cm

B. 72cm and 96cm

C. 18cm and 72cm

D. 18cm and 24cm

Answer: B

Watch Video Solution

306. A sonometer wire carries a brass weight of density 8 gm/cc at its free end and has a fundamental frequency 320 Hz, when the brass weight is completely immersed in water , then new frequency will be

A. 340Hz

B. 320Hz

C. 280Hz

D. 300Hz

Answer: D

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307. A sonometer wire of length 65cm is in resonance with a tuning fork of frequency N. If the length of the wire is decreased by 1cm and it is vibrated with the same tuning fork, 8 beats/s are heard, then the frequency of the tuning fork will be

A. 256Hz

B. 384Hz

C. 480Hz

D. 512Hz

Answer: D

Watch Video Solution

308. Two forks A and B when sounded together produce four beats s^{-1}. The fork A is in unison with 30 cm length of a sonometer wire and B is in unison with 25 cm length of the same wire at the same tension. The frequencies of the forks are

A. 24Hz, 28Hz,

B. 20Hz, 24Hz

C. 26Hz, 30Hz

D. 16Hz, 20Hz

Answer: B

Watch Video Solution

309. One metre long sonometer wire is stretched with a force of 4kg wt, another wire of same material and diamter is arranged along a side. The second wire is stretched with a force of 16kg wt. if the length of the second wire is in its second harmonic is the same as fifth harmonic of the first wire, then the length of the second wire will be

A. 40cm

B. 40cm

C. 80cm

D. 70cm

Answer: C

Watch Video Solution

310. Two wires are fixed on a sonometer with their tensions are in the ratio 8:1, the length are in the ratio 36,35, the diameters in the ratio 4:1 and densities in the ratio 1:2. If the note of higher pitch has a frequency of 360Hz, then the frequency of other string will be

A. 370Hz

B. 345

C. 350Hz

D. 425

Answer: C

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Watch Video Solution

311. A stretched string is in unison with a tuning fork of frequency 392Hz. If the length of the string is decreased by 2% , then the number of beats heard per second will be

A. 2

B. 4

C. 8

D. 16

Answer: C

Watch Video Solution

312. In a sonometer wire, the tension is maintained by suspending a 50.7 kg mass from the free end of the wire. The suspended mass has a volume of 0.0075 m 3. The fundamental frequency of the wire is 260 Hz . If the suspended mass is completely submerged in water, the fundamental frequency will become (take $g = 10ms^{-2}$)

[

A. 220 Hz

B. 230 Hz

C. 240 Hz

D. 260 Hz

Answer: C

Watch Video Solution

313. A wire under certain tension is in unison with a tuning fork when tension in the wire is increased by 2%, 3 beats/second are produced. Find the frequency of tuning fork.

A. 300Hz

B. 297Hz

C. 303Hz

D. 306Hz

Answer: A

Watch Video Solution

314. Two identical strings of a stringed musical instrument are in unison when stretched with the same tension. The tension in one string is increased by 1%, the musician hears 4 beat/s, then the frequency of the note when the string were in unison , will be

A. 796Hz

B. 800Hz

C. 804Hz

D. 808Hz

Answer: B

Watch Video Solution

315. The fundamental frequency of a sonometer wire increases by 5Hz , if it's tension is increased by 21% . How will the frequency be affected, if its length is increased by 10% ?

A. 55Hz

B. 45.45Hz

C. 40.45Hz

D. 48.32Hz

Answer: B

Watch Video Solution

316. A wire is under a tension of 32N and length between the two bridges in 1m. If the length of the sample wire is 10m and its mass is 2 g, then the fundamental frequency of the wire will be

A. 400Hz

B. 200Hz

C. 100Hz

D. 800Hz

Answer: B

Watch Video Solution

317. A wire under tension vibrates with a frequency of 450Hz. What would be the fundamental frequency, if the wire were half as long, twice as thick and under one fourth tension ?

A. 225Hz

B. 190Hz

C. 247Hz

D. 174Hz

Answer: A

Watch Video Solution

318. A sonometer wire of length 100cm has fundamental frequency of 320Hz. Then the velocity of the transverse waves is ,

A. 640 m/s

B. 160 m/s

C. 320 m/s

D. 480 m/s

Answer: A

Watch Video Solution

319. The frequency of the note produced by a sonometer wire will be decreased by 10%, if the tension is increased by

A. 0.1

B. 0.5

C. 1

D. 0.21

Answer: D

Watch Video Solution

320. The frequency of vibration of 20cm length of a sonometer wire (linear density is 0.0294 gm/cm) under a tension 3kg wt is (g= $980cm/s^2$)

A. 750Hz

B. 250Hz

C. 500Hz

D. 125Hz

Answer: B

Watch Video Solution

321. A stretched wire 60cm long emits a fundamental frequency of 240 Hz. By how much the length should be shortened so that it emits a fundamental note of 360 Hz?

A. 40cm

B. 60cm

C. 20cm

D. 10cm

Answer: C

Watch Video Solution

322. The string of monochord , vibrates 100 times a second. Its length is doubled and its tension is altered unitl it makes 150 vib/s . What is the ratio of the new tension to the old tension ?

A. $1:9$

B. $2:3$

C. $9:1$

D. $3:2$

Answer: C

Watch Video Solution

323. A sonometer wire is in unison with a tuning fork keeping the tension unchanged, the length of the wire between the bridges is doubled . Then the tuning fork will be still in resonance with the wire provided the wire vibrates in

A. 4 segments

B. 6 segments

C. 3 segments

D. 2 segments

Answer: D

View Text Solution

324. The frictionless pulley in melde's experiment plays the role of

A. Change in tension in the string

B. Loops are not clearly formed

C. Effective tension on the string will be greater than the applied tension

D. Can not be predicted

Answer: A

Watch Video Solution

325. The number of loops in perpendicular position in melde's experiment in equal to

A. Twice the number of loops in parallel position

B. The number of loops in parallel position

C. Half times the number of loops is parallel position

D. Can not be predicted

Answer: A

Watch Video Solution

326. Melde's experiment in perpendicular positon , the frequency of the string in equal to

A. Twice the frequency of the fork

B. Half times the frequency of the fork

C. Is exactly equal frequency of the tuning fork

D. Quadrupled the frequency of the fork

Answer: C

Watch Video Solution

327. The frequency of vibrating string, in melde's experiment in parallel position is equal to

A. Twice the frequency of the fork

B. Half times the frequency of the fork

C. Is exactly equal frequency of the tuning fork

D. Quadrupled the frequency of the fork

Answer: B

Watch Video Solution

328. In parallel position of melde's experiment, string vibrates

A. Twice the frequency of tuning fork

B. half the frequency of tuning fork

C. Is equal to the frequency of tuning fork

D. One fourth of frequency of tuning fork

Answer: B

Watch Video Solution

329. The frequency of the vibrating tuning fork in parallel position in melde's experiment is

A. $n = \frac{P}{2l}\sqrt{\frac{T}{m}}$

B. $n = \frac{P}{4l}\sqrt{\frac{T}{m}}$

C. $n = \frac{P}{l}\sqrt{\frac{T}{m}}$

D. $n = \frac{2P}{l}\sqrt{\frac{T}{m}}$

Answer: C

Watch Video Solution

330. The frequency of the vibrating tuning fork in perpendicular position in melde's experiment is

A. $n = \frac{P}{2l}\sqrt{\frac{T}{m}}$

B. $n = \frac{P}{4l}\sqrt{\frac{T}{m}}$

C. $n = \frac{P}{l}\sqrt{\frac{T}{m}}$

D. $n = \frac{2P}{l}\sqrt{\frac{T}{m}}$

Answer: A

Watch Video Solution

331. The number of loops in parallel position in melde's experiment in equal to

A. Twice number of loops in perpendicular position

B. Half of the number of loops in perpendicular position

C. The number of loops in perpendicular position

D. 4 times number of loops in perpendicular position

Answer: B

Watch Video Solution

332. A student performs the melde's experiment in parallel and perpendicular position and draws the conclusion .

A) number of loops in perpendicular position is equal to twice the number of loops in parallel position

B) the wavelength in perpendicular position is equal to twice the wave length of the wave in parallel position

C) of the period of the wave on the string in parallel position

D) the ratio of frequency of vibrating string in parallel to perpendicular position is 2:1

The correct statement is / are

A. A and D

B. A and C

C. A, B, C and D

D. A, C and D

Answer: B

View Text Solution

333. In melde's experiment, when tension in the string is 100gm wt and the tuning fork vibrates transversely , then the number of loops are 4. then the string in turned through 90°, so that is vibrates longitudinally. What is the extra tension required to form one loop in the string ?

A. 1500

B. 200

C. 300

D. 400

Answer: C

Watch Video Solution

334. In melde's experiment, 3 loops are formed when a mass of 25gm is put in a pan. If the number of loops changes to 6, then the mass in the pan will be (mass of empty pan $m_0 = 7gm$)

A. 0gm

B. 1gm

C. 2gm

D. 0.5gm

Answer: B

Watch Video Solution

335. In Melde's experiment the srting vibrates in 4 loops when a 50 g weight is placed on the pan of weight 15 g.How much weight must be added or removed to make the string vibrate in 6 loops ?

A. 7gm

B. 36gm

C. 21gm

D. 29gm

Answer: B

Watch Video Solution

336. If there are six loops for 1 m length in transverse mode of melde's experiment, then the number of loops in longitudinal mode under identical conditions would be

A. 3

B. 6

C. 12

D. 8

Answer: A

Watch Video Solution

337. In melde's experiment , 3 loops are formed of by putting a weight of 8gm in a massless pan. Then the weight required to form two loops is

A. 18gm

B. 8gm

C. 36gm

D. 24gm

Answer: A

Watch Video Solution

338. In melde's experiment, the number of loops on the string changes from 5 to 4 , when the tension ine the string is increased by 0.018gm wt , then the initial tension in the string will be

A. 3.2kg wt

B. 0.032kg wt

C. 0.018kg wt

D. 1.8 kg wt

Answer: B

Watch Video Solution

339. In melde's experiment, the tuning fork was arranged in parallel position and the string was stretched by a weight of 4×10^{-3} kg and mass per unit length of the string is $9.8 \times 10^{-5} kg/m$. If 4 loops were formed on a length 80cm of the string, then the frequency of the fork will be

A. 50Hz

B. 100Hz

C. 10Hz

D. 25Hz

Answer: B

Watch Video Solution

340. In melde's experiment in perpendicular position , 6 loops are obtained when a mass of 6gm is put in the pan. When the arrangement is changed to parallel position without disturbing other setup, a mass of 14.75 gm is to be put in the pan to obtain 2 loops . then the mass of the pan will be

A. 2gm

B. 1gm

C. 1.8gm

D. 0gm

Answer: B

Watch Video Solution

341. In an experiment , it was found that a string vibrated in 5 loops when 100gm was placed in the pan. What must be placed in the pan to make the string vibrate in 10 loops ?

A. 100gm

B. 50gm

C. 75gm

D. 25gm

Answer: D

Watch Video Solution

342. The condition for first resonance in a resonating air column closed at one end is

A. l+e=$\lambda/2$

B. $l+2e=\lambda/2$

C. $l+e=\lambda/4$

D. $l+2e=\lambda/4$

Answer: C

Watch Video Solution

343. In a resonance tube experiment, two resonating lengths are taken , because

A. One reading is not suffcient

B. Average is to be calculated s

C. End correction is eliminated

D. To minimise the error

Answer: C

Watch Video Solution

344. If oil of density higher than that of water is used in place of water in a resonance tube its frequency will be

A. Decrease

B. Increase

C. Remain the same

D. Can not say

Answer: C

Watch Video Solution

345. In a resonance tube experiment ,a tuning fork resonates with an air column produces first resonating length of 12.5cm and second resonating length of 40cm . Then the end correction is

A. 1cm

B. 1.25cm

C. 3cm

D. 0.12cm

Answer: B

Watch Video Solution

346. If the end correction of closed organ pipe is 0.3 cm then the diameter of the tube will be

A. 0.05m

B. 0.5m

C. 1cm

D. 3cm

Answer: C

Watch Video Solution

347. In a resonance column first and second resonance are obtained at depths 22.7 cm and 70.2 cm. The third resonance will be obtained at a depth of

A. 117.7cm

B. 92.9cm

C. 115.5cm

D. 113.5cm

Answer: A

Watch Video Solution

348. For a resonance tube, the air columns for the first and the second resonance differ in length by $31.5cm$. The wavelength of the wave is

A. 31.5cm

B. 63.0cm

C. 126.0cm

D. 252.0cm

Answer: B

Watch Video Solution

349. In a resonance tube experiment, the first resonating length of air column is 0.2m and second resonating length of air column is 0.62 m, then the inner diameter of the tube is

A. 2.33cm

B. 3.33cm

C. 1.33cm

D. 04.44cm

Answer: B

Watch Video Solution

350. Which of the following is the example of transverse wave

A. Sound waves

B. Compressional waves in a string

C. Vibration of string

D. None of these

Answer: A

Watch Video Solution

351. An organ pipe P_1 closed at one vibrating in its first overtone and another pipe P_2. Open at both ends vibrating in third overtone are in resonance with a given tuning fork. The ratio of the length of P_1 to that of P_2 is

A. $1:2$

B. $1:3$

C. $3 : 4$

D. $3 : 8$

Answer: D

Watch Video Solution

352. If the length of the vibrating string is kept constant , then frequency of the string will be directly proportional to

A. $\sqrt{T}$

B. T

C. $\frac{1}{T}$

D. $\sqrt{\frac{1}{T}}$

Answer: A

Watch Video Solution

Watch Video Solution

353. If the length of a closed organ pipe is 1m and velocity of sound is 330 m/s , then the frequency for the second note is

A. $4 \times \frac{330}{4} Hz$

B. $3 \times \frac{330}{4} Hz$

C. $2 \times \frac{330}{4} Hz$

D. $2 \times \frac{4}{330} Hz$

Answer: B

Watch Video Solution

354. A steel rod 100 cm long is clamped at its centre. The fundmental frequency of longitudinal viberations of the rod are given to be 2.53kHz. What is the speed of sound is steel?

A. 5.06km/s

B. 6.06km/s

C. 7.06km/s

D. 8.06km/s

Answer: A

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355. The true statement about stationary waves is

A. Dispalcement at nodes is maximum

B. Displacement at antinodes is minimum

C. Displacement at nodes is zero and that at antinodes is maximum

D. None of these

Answer: C

Watch Video Solution

356. The term 0.3d, where d being inner diameter of tube is called as

A. Laplace's correction

B. Rayleigh's correction

C. Radiation correction

D. Epoch

Answer: B

Watch Video Solution

357. What is phase difference between two waves, if the resultant amplitude due to their superposition is same as that of the waves?

A. $\pi/2$

B. π

C. $2\pi/3$

D. $\pi/4$

Answer: C

Watch Video Solution

358. In a resonance tube experiment, two successive resonances are heard at 15 cm 48 cm. End correction will be

A. 1.5cm

B. 3cm

C. 2.5cm

D. 1cm

Answer: A

Watch Video Solution

359. An organ pipe open at one end is vibrating in first overtone and is in resonance with another pipe open at both ends and vibrating in third harmonic. The ratio of length of two pipes is–

A. $2:1$

B. $1:4$

C. $1:1$

D. $1:2$

Answer: D

Watch Video Solution

360. 4 loops are formed in 80cm of wire . Then the wavelength of wave is

A. 20cm

B. 80cm

C. 160cm

D. 40cm

Answer: D

Watch Video Solution

361. The velocity of wave in a stretched string is proportional to

A. $\sqrt{T}$

B. T

C. $1/T$

D. $1/\sqrt{T}$

Answer: A

Watch Video Solution

362. Transverse position in melde's experiment is changed to parallel position , if length of string remaining the same and tension is made half. If in perpendicular position 4 loops are formed, then the number of loops formed in parallel position

A. 1

B. 2

C. 3

D. 4

Answer: B

Watch Video Solution

363. In a pipe open at both the ends the distance between node and antinode is

A. $\lambda / 4$

B. $\lambda / 2$

C. $(3\lambda) / 2$

D. None of these

Answer: A

Watch Video Solution

364. The harmonics which are present in a pipe open at one end are

A. Odd harmonics

B. Even harmonics

C. Even as well as odd harmonics

D. None of these

Answer: A

Watch Video Solution

365. In Melde's experiment, the string vibrates in 4 loops when a 50 gram weight is placed in the pan of weight 15 gram . To make the string to vibrates in 6 loops the weight that has to be removed from the pan is

A. 0.0007 kg wt

B. 0.0021kg wt

C. 0.0036 kg wt

D. 0.0029kg wt

Answer: C

Watch Video Solution

366. A sonometer wire of length $l_1$is in reasonance with a frequency 250 Hz. If the length of wire is increasesed then 2 beats per second are heard. What is ratio of the lengths of the wire ?

A. 125:124

B. 250:313

C. $5:3$

D. $41:57$

Answer: A

Watch Video Solution

367. The length of vibrating wire is 60cm and frequency is 110Hz. When the length is decreased frequency is 110Hz. When the length is decreased by 5 cm, then the number of beats produced is

A. 10

B. 6

C. 5

D. 8

Answer: A

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368. Length of 0.3 m wire vibrates in fundamental mode at frequency 480Hz. Then the velocity of sound wave in air is

A. 330m/s

B. 320m/s

C. 300m/s

D. 288m/s

Answer: D

Watch Video Solution

369. Speed of sound is air is 340 m/s. The length of air column is 34 cm. The frequency of 5^{th} overtone of pipe closed at one end is

A. 2000Hz

B. 2750Hz

C. 2500Hz

D. 2800Hz

Answer: B

Watch Video Solution

370. What is nature of waves on stretched sonometer wire ?

A. Transverse progressive polarised

B. Longitudinal progressive polarised

C. Transverse stationary polarised

D. Upolarised

Answer: C

Watch Video Solution

371. If the length of an open organ pipe is 33.3cm , then the frequency of fifth overtone will be

A. 3000Hz

B. 2500Hz

C. 1500Hz

D. 1250Hz

Answer: A

Watch Video Solution

372. A wire of length L, density ρ and young's modulus Y produces an elongation 1 in wire by applying load, then frequency of wire is

A. $\frac{1}{2L}\sqrt{\frac{Yl}{\rho l}}$

B. $\frac{1}{2L}\sqrt{\frac{YL}{\rho l}}$

C. $\frac{1}{L}\sqrt{\frac{YL}{\rho l}}$

D. $\frac{1}{L}\sqrt{\frac{Yl}{\rho L}}$

Answer: A

Watch Video Solution

373. A string is stretched within two rigid ends. It is vibrated in a node of first overtone. Which of the following is formed at a middle point of a string ?

A. Antinodes

B. Node

C. Either node or antinode

D. Neither node nor the antinode

Answer: B

Watch Video Solution

374. The fundamental frequency of a closed pipe , if its first overtone is unison with a tuning fork of 480Hz is

A. 120Hz

B. 320Hz

C. 160Hz

D. 240Hz

Answer: C

Watch Video Solution

375. If the fifth overtone of a closed pipe is in unison with the fifth overtone of an open pipe, then the ratio of the length of closed pipe to open pipe will be

A. $12/11$

B. $11/12$

C. $5/6$

D. $6/5$

Answer: B

Watch Video Solution

376. A pipe of lengths 10 cm, closed at one edn, has frequency equal to half the 2^{nd} overtone of another pipe open at the ends. The lengths of the open pipe is

A. 10cm

B. 20cm

C. 35cm

D. 30cm

Answer: D

Watch Video Solution

377. The speed of a transverse wave (v) along a stretched string is given by

A. $\sqrt{\frac{T}{m}}$

B. $\sqrt{\frac{m}{T}}$

C. $\sqrt{\frac{P}{E}}$

D. $\sqrt{1. m}$

Answer: A

Watch Video Solution

378. In Melde's experiment in parallel position the mass of the pan is M_0. When a mass m_1 is kept in the pan, the number of loops formed is p_1. For the mass m_2, the number of loops, formed is p_2. Then the mass of the pan M_0, in terms of m_1, m_2, p_1 and p_2 is given by

A. $\dfrac{m_1 p_2^2 - m_2 p_1^2}{p_1^2 - p_2^2}$

B. $\dfrac{m_2 p_2^2 - m_1 p_1^2}{p_1^2 - p_{2-}^2}$

C. $\dfrac{p_1^2 - p_2^2}{m_2 p_2^2 - m_1 p_1^2}$

D. $\dfrac{p_2^2 - p_1^2}{m_1 p_2^2 - m_1 p_1^2}$

Answer: B

Watch Video Solution

379. A stationary wave incident on rigid wall. Then the distance between wall and first antinode is (velocity of wave is 36 m/s and frequency 72Hz)

A. 1/2m

B. 1/4m

C. 1/8m

D. 1m

Answer: C

Watch Video Solution

380. The frequency of open organ pipe is

A. $\dfrac{v}{2l + 0.4d}$

B. $\dfrac{v}{2l + 0.6d}$

C. $\dfrac{v}{2l + 0.8d}$

D. $\dfrac{v}{2l + 1.2d}$

Answer: D

Watch Video Solution

381. $y = 3\cos 100\pi(2t - x)$, the value of λ is

A. 4cm

B. 6cm

C. 2cm

D. 1cm

Answer: C

Watch Video Solution

382. In open organ pipe, first overtone produced is of such frequency that length of the pipe is equal to

A. $\lambda/4$

B. $\lambda/3$

C. $\lambda/2$

D. λ

Answer: D

Watch Video Solution

383. The tension of a stretched string is increased by 69%. In order to keep its frequency of vibration constant, its length must be increased by :

A. 0.2

B. 0.3

C. $\sqrt{69}\,\%$

D. 0.69

Answer: B

Watch Video Solution

384. Keeping the length of the pipe constant if diameter of the pipe increased twice , then frequency of pipe will

A. Slightly increases

B. Slightly decreases

C. Remains constant

D. Increases four times

Answer: B

Watch Video Solution

385. If the frequency of first harmonic of a closed pipe is in unison with the third harmonic of an open pipe. Then, the ratio of lengths of the pipe closed at one end to the open at both the ends is

A. $1/12$

B. $3/4$

C. $1/6$

D. $6/7$

Answer: C

Watch Video Solution

386. A transverse wave is propagating along a string of length l. when string elongated by l/20 cm, velocity of wave is v. what will be its velocity when it is elongatd by l/10 ?

A. 2v

B. v

C. $2\sqrt{2}v$

D. $\sqrt{2}v$

Answer: D

Watch Video Solution

387. If oil of density higher than that of water is used in place of water in a resonance tube its frequency will be

A. Decrease

B. Increase

C. Remain the same

D. Can not say

Answer: C

Watch Video Solution

388. The stirng stretched by tension T and length L vibrates in resonance with a tuning fork of frequency n. the tension in the stretched string is increased by 69% and length of string reduced by 35%. Then, the frequency of vibrating string is

A. n

B. 1.5n

C. 2n

D. n/2

Answer: C

Watch Video Solution

389. n_1 is the frequency of the pipe closed at one 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. $\frac{n_1 n_2}{2n_2 + n_1}$

B. $\frac{2n_1 n_2}{2n_2 + n_1}$

C. $\frac{2n_2 n_1}{n_1 + n_2}$

D. $\dfrac{n_2 + 2n_1}{n_1 n_2}$

Answer: A

Watch Video Solution

390. The value of end correction for an open organ pipe of radius r is ________ .

A. 0.3r

B. 0.6r

C. 0.9r

D. 1.2r

Answer: D

Watch Video Solution

391. The fundamental frequency of transverse vibration of a stretched string of radius r is proportional to

A. r^{-2}

B. r^{-1}

C. $r^{-1/2}$

D. r^2

Answer: B

Watch Video Solution

392. In a sonometer experiment the bridges are separted by a fixed distance the wire which is slightly elastic emits a tone of frequency n when held by tension T If the tension is increased to 4T the tone emitted by the wire will be of frequency

A. n

B. 2n

C. slightly greater than 2n

D. Slightly less than 2n

Answer: D

Watch Video Solution

393. An open and closed organ pipe have the same length the ratio pth mode of frequency of vibration of air in two pipe is

A. p(2p+1)

B. 2p/2p-1

C. p

D. 1

Answer: B

Watch Video Solution

394. In a pipe opened at both ends n_1 and n_2 be the frequencies corresponding to vibrating lengths L_1 and L_2 respectively .The end correction is

A. $\dfrac{n_1 l_1 - n_1 l_2}{2(n_1 - n_2)}$

B. $\dfrac{n_2 l_2 - n_1 l_1}{2(n_2 - n_1)}$

C. $\dfrac{n_2 l_2 - n_1 l_1}{2(n_1 - n_2)}$

D. $\dfrac{n_1 l_1 - n_2 l_2}{n_1 - n_2}$

Answer: C

Watch Video Solution

395. The length and diameter of a metal wire is doubled the fundamental frequency of vibration will change from n to (tension being kept constant and material of both the wires is same)

A. n/4

B. n/8

C. n/12

D. n/16

Answer: A

Watch Video Solution

396. A sonometer wire vibrates with frequency n_1 in air under suitable load of specific gravity σ . When the load is immersed in water , the frequency of vibration of wire n_2 will be .....

A. $n_1\sqrt{\dfrac{\sigma+1}{\sigma}}$

B. $n_1\sqrt{\dfrac{\sigma-1}{\sigma}}$

C. $n_1\sqrt{\dfrac{\sigma}{\sigma+1}}$

D. $n_1\sqrt{\dfrac{\sigma}{\sigma-1}}$

Answer: B

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