EdLoop

EdLoop EAPCET

PHYSICS · EAPCET (EAMCET)

Waves

Previous Year Questions with answers

206 questions · **142** papers · **2010–2026** · newest paper first

Step-by-step solutions for every question: free in the EdLoop EAPCET app (Google Play) · pyq.edloop.in

What is in this PDF: every Waves question we hold from past AP and TS EAPCET (called EAMCET until 2020 in Andhra Pradesh and 2023 in Telangana) papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

Step-by-step solutions for every question are free in the EdLoop EAPCET app (Google Play) and on app.edloop.in. More chapters: pyq.edloop.in/free-pdfs/

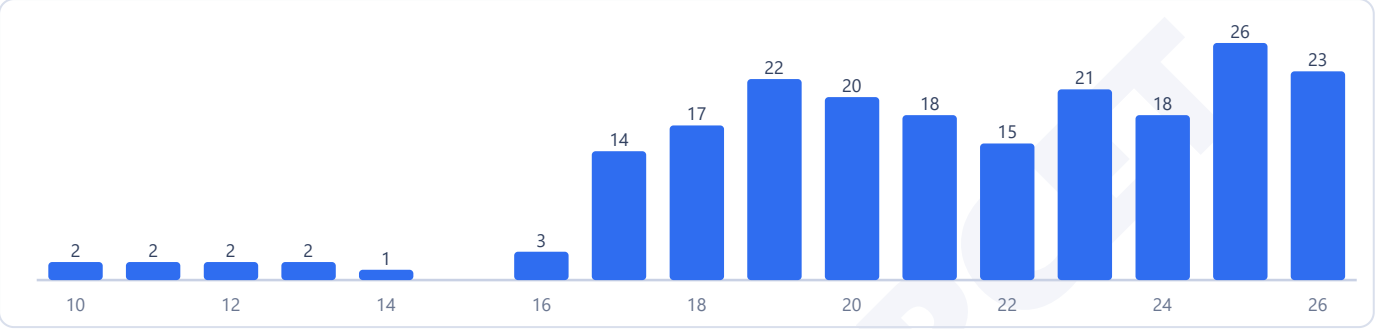
EdLoop EA

Chapter at a glance

3.3%	206	75 of 77	206 / 0
of Physics questions, 2022–2026	questions, 2010–2026	papers asked it, 2022–2026	MCQ / numerical, 2010–2026

Trend. Rising: 1.5 questions per paper in 2024–2026 against 1.2 in 2022–2023.

Questions per year



Counts are the questions we hold: 206 in 142 papers. 2 questions in this chapter came back in more than one paper.

Most-asked topics in this chapter (2010–2026)

Wave Motion	56
Doppler Effect	52
Sound Waves	52
Superposition & Standing Waves	46

How often it comes up

Mechanical waves and acoustics provide a regular stream of questions in Class 11 physics. Our collection of AP and TS EAPCET papers spanning 2022 to 2026 records 103 questions from Waves across 77 papers. That corresponds to an average of 1.3 questions per paper, representing 3.3% of all physics questions in that recent window. Looking at the full historical record from 2010 to 2026, Waves accounted for 206 questions across 149 papers, maintaining an average of 1.4 questions per paper and a 3.5% subject share. Across the earlier testing period from 2010 to 2021, our archive records 103 questions across 72 papers, representing 1.4 questions per paper and a 3.6% share. In the last three exam years from 2024 to 2026, the chapter provided 67 questions across 46 papers, registering a 3.6% share. Historical comparisons indicate that the subject share from 2024 to 2026 is about the same when weighed against the early 2010–2021 papers, and about the same when compared with the recent 2022–2026 period.

State-level distributions indicate stronger emphasis in Telangana. Between 2022 and 2026, AP EAPCET papers in our set contributed 52 questions across 48 papers, with 47 papers featuring at least one question (1.1 per paper, 2.7% share). Over the same window, TS EAPCET contributed 51 questions across 29 papers in our set, with 28 papers carrying questions (1.8 per paper, 4.4% share). Waves has appeared every year since 2022, though two papers in our collection omitted it, so it was not present in all 77 sittings. The chapter ranks 14th of 28 physics chapters by question share between 2022 and 2026. The busiest single sitting in our collection was 2025, which saw 26 questions across 16 papers.

Most-asked topics

Questions distribute across four balanced themes:

- **Wave Motion**: Recent papers included 29 questions, out of 56 questions across the full archive. It tests the wave equation $y = A \sin(k x - \omega t + \varphi)$, wave speed on stretched strings, longitudinal versus transverse propagation,

and energy transport.

- **Sound Waves**: This area provided 29 questions between 2022 and 2026 and 52 questions overall. Key concepts involve speed of sound via Laplace's correction, organ pipes open at one or both ends, end corrections, and beats.
- **Doppler Effect**: Examiners set 23 questions in the recent five-year span, contributing to 52 questions across all years in our archive. It tests apparent frequency shifts when source, observer, and medium move along the line of sight.
- **Superposition & Standing Waves**: A pool of 22 questions appeared recently, out of 46 questions in the complete record. Topics cover stationary waves on strings, nodes and antinodes, resonance tubes, and harmonic frequencies.

What the questions look like

Organ pipe problems are a fixture of every exam season. Questions regularly compare the fundamental or overtone frequencies of an open organ pipe with a closed pipe of identical or differing length. Another classic problem involves a vibrating sonometer wire tuned to a tuning fork: raising or lowering string tension slightly produces beats, requiring students to determine the original or altered frequency of the wire.

Doppler effect problems remain prominent in both state exams. Standard configurations involve a moving vehicle sounding a horn while approaching a stationary observer or rigid wall, where the observer hears both direct sound and reflected echoes, creating beats. In progressive wave kinematics, examiners supply an analytical wave equation and ask for maximum particle velocity, wave velocity, or the phase difference between two points separated by a given spatial distance.

How to practise it

Start by mastering progressive wave relations: wave velocity $v = f \lambda = \omega / k$, where angular wave number $k = 2 \pi / \lambda$. Remember that maximum particle velocity is $v_{max} = \omega A$, while wave propagation speed on a string under tension T and linear mass density μ is $v = \sqrt{(T / \mu)}$. For sound in an ideal gas, use Laplace's formula $v = \sqrt{(\gamma P / \rho)} = \sqrt{(\gamma R T / M)}$.

Next, memorize standing wave mode frequencies thoroughly. For a string fixed at both ends or an open organ pipe of length L, resonant frequencies form an integer harmonic series $f_n = n v / (\text{two } L)$. For a pipe closed at one end, only odd harmonics exist: $f_n = (\text{two } n - 1) v / (\text{four } L)$. Incorporate acoustic end corrections when specified, where each open end adds an effective length proportional to inner radius r.

Finally, master the Doppler equation for sound. Write the comprehensive formula $f_{observed} = f_{source} \times (v \pm v_{medium} \pm v_{observer}) / (v \pm v_{medium} \pm v_{source})$. Set up positive coordinate axes from source toward observer to maintain consistent sign conventions, especially when factoring in wind velocity or wall reflections.

EdLoop EAPCET

Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

An observer moves towards a stationary source of sound with a velocity one fourth of the velocity of sound. Then the percentage of increase in the apparent frequency observed by the observer

(A) 25%
(B) 20%
(C) 30%
(D) 50%

Answer: (A) 25% · The council's preliminary key

Q2 AP EAPCET 2026 · 18 May · Shift 2 MCQ

A sound source of $1000\ Hz$ frequency approaches the observer with speed $20\ ms^{-1}$. The observed frequency of sound is nearly
(speed of sound in air = $340\ ms^{-1}$)

(A) $1060\ Hz$
(B) $940\ Hz$
(C) $1020\ Hz$
(D) $1000\ Hz$

Answer: (A) $1060\ Hz$ · The council's preliminary key

Q3 AP EAPCET 2026 · 18 May · Shift 2 MCQ

How fast a person should drive his car so that the red signal of light appears green?
(wavelengths of red and green colours are 6200Å and 5400Å respectively)

(A) $1.5 \times 10^8\ ms^{-1}$
(B) $7 \times 10^7\ ms^{-1}$
(C) $3.9 \times 10^7\ ms^{-1}$
(D) $2 \times 10^8\ ms^{-1}$

Answer: (C) $3.9 \times 10^7\ ms^{-1}$ · The council's preliminary key

Q4 AP EAPCET 2026 · 15 May · Shift 1 MCQ

A car is approaching a cliff at a constant speed. It sounds a horn when it is at $0.9\ km$ from the cliff. The reflected sound of the horn is heard by car driver after 5 sec. The speed of the car is
[Velocity of sound in air is $330\ ms^{-1}$]

EdLoop EAPCET

(A) $20\ ms^{-1}$
(B) $30\ ms^{-1}$
(C) $40\ ms^{-1}$
(D) $50\ ms^{-1}$

Answer: (B) $30\ ms^{-1}$ · The council's preliminary key

Q5 AP EAPCET 2026 · 15 May · Shift 2 MCQ

A wire of density $9 \times 10^3\ \mathrm{kg\ m^{-3}}$ is stretched between two clamps of 1 m apart and is subjected to an extension of 4.9×10^{-4} m. The lowest frequency of transverse vibrations in the wire is (Young's modulus of the material of the wire $Y = 9 \times 10^{10}\ \mathrm{Nm^{-2}}$)

(A) 40 Hz
(B) 35 Hz
(C) 30 Hz
(D) 25 Hz

Answer: (B) 35 Hz · The council's preliminary key

Q6 AP EAPCET 2026 · 14 May · Shift 1 MCQ

A person at rest hears an electric siren which is stationary. Now the person accelerates at $2\,ms^{-2}$ along a straight line path. The distance travelled by him when he hears the frequency of the siren as 94% of its initial value is (speed of sound in air = $330\,ms^{-1}$)

(A) $49\ m$
(B) $98\ m$
(C) $147\ m$
(D) $196\ m$

Answer: (B) $98\ m$ · The council's preliminary key

Q7 AP EAPCET 2026 · 14 May · Shift 2 MCQ

Two vibrating tuning forks produce progressive waves given by $y_1 = 2\sin(500\pi t - ax)$ and $y_2 = 2\sin(506\pi t - bx)$. Number of beats produced per minute is

(A) 360
(B) 180
(C) 60
(D) 3

Answer: (B) 180 · The council's preliminary key

Q8 AP EAPCET 2026 · 13 May · Shift 1 MCQ

Two identical strings A and B of same material are having tensions T_A and T_B respectively. If their fundamental frequencies are $450\ Hz$ and $300\ Hz$, then T_A/T_B is

(A) $\frac{4}{9}$
(B) $\frac{2}{9}$
(C) $\frac{6}{4}$
(D) $\frac{9}{4}$

Answer: (D) $\frac{9}{4}$ · The council's preliminary key

Q9 AP EAPCET 2026 · 13 May · Shift 2 MCQ

Ten tuning forks are arranged in increasing order of frequency. Any two nearest tuning forks produce 4 beats per second. The highest frequency of tuning fork is twice that of the lowest possible, then the highest and lowest frequencies, in Hz, are respectively

(A) 80 and 40
(B) 100 and 60
(C) 72 and 32
(D) 72 and 36

Answer: (D) 72 and 36 · The council's preliminary key

Q10 AP EAPCET 2026 · 12 May · Shift 1 MCQ

Two waves of amplitude 'A' and frequency 'ν' are superimposed with each other. After super position, the maximum intensity is

(A) A
(B) A^2
(C) $2\mathrm{A}$
(D) $4\mathrm{A}^2$

Answer: (D) $4\mathrm{A}^2$ · The council's preliminary key

Q11 AP EAPCET 2026 · 12 May · Shift 2 MCQ

Two identical strings each of length $0.750\ m$ are each tuned exactly to $440\ Hz$. The tension in one of the strings is then increased by $1.0\ \%$. If they are now struck, then the beat frequency between the fundamentals of the two strings is nearly

(A) 1
(B) 2
(C) 3
(D) No beats

Answer: (B) 2 · The council's preliminary key

Q12 TS EAPCET 2026 · 11 May · Shift 1 MCQ

A wire of length 100 cm is clamped between two rigid supports and is made to vibrate in its fundamental mode. If the amplitude at the midpoint of the wire is A, then the distance between two points having amplitude of $\frac{A}{\sqrt{2}}$ is

(A) 50 cm
(B) 60 cm
(C) 40 cm
(D) 25 cm

Answer: (A) 50 cm · The council's preliminary key

Q13 TS EAPCET 2026 · 11 May · Shift 1 MCQ

The lengths of two open pipes are in the ratio 5:6. If 8 beats are heard per second when both the pipes are vibrated in their fundamental modes, then the frequency of third harmonic of the longer pipe is

(A) 144 Hz
(B) 240 Hz
(C) 120 Hz
(D) 60 Hz

Answer: (C) 120 Hz · The council's preliminary key

Q14 TS EAPCET 2026 · 11 May · Shift 2 MCQ

The speed of a progressive transverse wave on a string is $18\,\mathrm{ms}^{-1}$. If the phase difference between two points on the string separated by a distance of 3 cm is 90°, then the frequency of the transverse waves on the string is

(A) 300 Hz
(B) 225 Hz
(C) 75 Hz
(D) 150 Hz

Answer: (D) 150 Hz · The council's preliminary key

Q15 TS EAPCET 2026 · 11 May · Shift 2 MCQ

A source producing sound of frequency 990 Hz and an observer are initially at rest. If both the source and observer start moving simultaneously towards each other with accelerations $2\,\mathrm{ms}^{-2}$ and $4\,\mathrm{ms}^{-2}$ respectively, then the frequency of sound heard by the observer at a time of $\mathrm{t} = 5\mathrm{s}$ is

(Speed of sound in air $= 340\,\mathrm{ms}^{-1}$)

(A) 960 Hz
(B) 1080 Hz
(C) 1050 Hz
(D) 900 Hz

Answer: (B) 1080 Hz · The council's preliminary key

Q16 TS EAPCET 2026 · 10 May · Shift 1 MCQ

A wire of length 1.2 m is subjected to a tension of 240 N. If the frequencies of two successive modes of vibration of the wire are 200 Hz and 250 Hz, then the mass of the wire is

(A) 10 g
(B) 20 g
(C) 30 g
(D) 40 g

Answer: (B) 20 g · The council's preliminary key

Q17 TS EAPCET 2026 · 10 May · Shift 1 MCQ

Two observers A and B are moving towards a stationary source of sound with speeds $0.8V_0$ and $0.6V_0$ respectively, where V_0 is the speed of sound in air. The ratio of the frequencies of the sound heard by the observers A and B is

(A) $4:3$
(B) $9:8$
(C) $1:1$
(D) $2:3$

Answer: (B) $9:8$ · The council's preliminary key

Q18 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If a 200 cm long steel rod clamped at its middle is vibrated in its fundamental mode with a frequency of 1.25 kHz, then the speed of longitudinal waves in the rod is

EdLoop EAPCET

(A) $1.25\ \text{kms}^{-1}$
(B) $2.5\ \text{kms}^{-1}$
(C) $5\ \text{kms}^{-1}$
(D) $6.25\ \text{kms}^{-1}$

Answer: (C) $5\ \text{kms}^{-1}$ · The council's preliminary key

Q19 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If a source of sound initially at rest is moving away from a stationery observer with an acceleration of $11\ \text{ms}^{-2}$, then the time taken for the frequency of sound heard by the observer to become 10 % less than the frequency of source is
(Speed of sound in air $= 330\ \text{ms}^{-1}$)

(A) $4.4\ \text{s}$
(B) $1.1\ \text{s}$
(C) $2.2\ \text{s}$
(D) $3.3\ \text{s}$

Answer: (D) $3.3\ \text{s}$ · The council's preliminary key

Q20 TS EAPCET 2026 · 9 May · Shift 1 MCQ

If sound waves of frequency 169 Hz incident horizontally on a perfectly rigid vertical wall, then the shortest distance from the wall at which the air particle will have maximum amplitude of vibration is
(Speed of sound in air $= 338\ \text{ms}^{-1}$)

(A) 50 cm
(B) 25 cm
(C) 100 cm
(D) 75 cm

Answer: (A) 50 cm · The council's preliminary key

Q21 TS EAPCET 2026 · 9 May · Shift 1 MCQ

Two stationary sources P and Q produce sounds of equal frequency of 170 Hz. The velocity with which an observer has to move from source P towards source Q such that 8 beats are to be heard per second by the observer is
(Speed of sound in air $= 340\ \text{ms}^{-1}$)

EdLoop EAPCET

(A) $20\,\mathrm{ms}^{-1}$
(B) $16\,\mathrm{ms}^{-1}$
(C) $4\,\mathrm{ms}^{-1}$
(D) $8\,\mathrm{ms}^{-1}$

Answer: (D) $8\,\mathrm{ms}^{-1}$ · The council's preliminary key

Q22 TS EAPCET 2026 · 9 May · Shift 2 MCQ

The length of an open pipe is half of the length of another closed pipe. When the two pipes are vibrated, four nodes are formed in both the cases. The ratio of the frequencies of the open and the closed pipes is

(A) $1:1$
(B) $16:7$
(C) $16:3$
(D) $7:3$

Answer: (B) $16:7$ · The council's preliminary key

Q23 TS EAPCET 2026 · 9 May · Shift 2 MCQ

A source of sound of frequency 660 Hz and an observer are moving towards each other with speeds of 31 kmph and 23 kmph respectively. If the wind blows with a speed of 5 kmph from observer towards the source, then the frequency of the sound heard by the observer is

(Speed of sound in air $= 340\ \mathrm{ms}^{-1}$)

(A) 630 Hz
(B) 660 Hz
(C) 690 Hz
(D) 720 Hz

Answer: (C) 690 Hz · The council's preliminary key

Q24 AP EAPCET 2025 · 27 May · Shift 1 MCQ

A sound wave of frequency 500 Hz travels between two points X and Y separated by a distance of 600 m in a time of 2 s. The number of waves between the points X and Y are

(A) 1000
(B) 1500
(C) 300
(D) 600

Answer: (A) 1000 · The council's preliminary key

EdLoop EAPCET

Q25 AP EAPCET 2025 · 26 May · Shift 1 MCQ

When both source of sound and observer approach each other with a speed equal to 10% of the speed of sound, then the percentage change in frequency heard by the observer is nearly

(A) 33.3%
(B) 12.2%
(C) 22.2%
(D) 11.1%

Answer: (C) 22.2% · The council's preliminary key

Q26 AP EAPCET 2025 · 26 May · Shift 1 MCQ

If the magnetic field in a plane progressive wave is represented by the equation $B_y = 2 \times 10^{-7} \sin(0.5 \times 10^3 x + 1.5\pi \times 10^{11} t)$ T, then the frequency of the wave is (In the equation time t is in second)

(A) 75×10^9 Hz
(B) 150×10^9 Hz
(C) 75×10^7 Hz
(D) 150×10^7 Hz

Answer: (A) 75×10^9 Hz · The council's preliminary key

Q27 AP EAPCET 2025 · 26 May · Shift 2 MCQ

The equation of a transverse wave propagating along a stretched string of length 80 cm is $y = 1.5 \sin\{(5 \times 10^{-3} x) + 20t\}$, here 'x' and 'y' are in cm and the time 't' is in second. If the mass of the string is 3 g, then the tension in the string is

(A) 12 N
(B) 4 N
(C) 6 N
(D) 8 N

Answer: (C) 6 N · The council's preliminary key

Q28 AP EAPCET 2025 · 24 May · Shift 1 MCQ

If a travelling wave is given by $y(x, t) = 0.5 \sin(70.1x - 10\pi t)$, where x and y are in metre, the time t is in second, then the frequency of the wave is

EdLoop EAPCET

(A) 6 Hz
(B) 7 Hz
(C) 4 Hz
(D) 5 Hz

Answer: (D) 5 Hz · The council's preliminary key

Q29 AP EAPCET 2025 · 24 May · Shift 1 MCQ

The path difference between two waves given by the equations $y_1 = a_1 \sin\left(\omega t - \frac{2\pi x}{\lambda}\right)$ and $y_2 = a_2 \sin\left(\omega t - \frac{2\pi x}{\lambda} + \phi\right)$ is

(A) $\left(\frac{\lambda}{\pi}\phi\right)$
(B) $\frac{\lambda}{\pi}\left(\phi - \frac{\pi}{2}\right)$
(C) $\frac{\lambda}{2\pi}\phi$
(D) $\frac{\lambda}{2\pi}\left(\phi - \frac{\pi}{2}\right)$

Answer: (C) $\frac{\lambda}{2\pi}\phi$ · The council's preliminary key

Q30 AP EAPCET 2025 · 23 May · Shift 1 MCQ

In a closed organ pipe, the number of nodes formed in fifth and ninth harmonics are respectively

(A) 5, 9
(B) 3, 5
(C) 5, 7
(D) 2, 4

Answer: (B) 3, 5 · The council's preliminary key

Q31 AP EAPCET 2025 · 23 May · Shift 2 MCQ

If two progressive sound waves represented by $y_1 = 3\sin 250\pi t$ and $y_2 = 2\sin 260\pi t$ (where displacement is in metre and time is in second) superimpose, then the time interval between two successive maximum intensities is

(A) 0.1 s
(B) 0.4 s
(C) 0.5 s
(D) 0.2 s

Answer: (D) 0.2 s · The council's preliminary key

Q32 AP EAPCET 2025 · 22 May · Shift 1 MCQ

A steel wire of length 81 cm has a mass of 5×10^{-3} kg. If the wire is under a tension of 50 N, then the speed of transverse waves on the wire is

(A) $100\ \text{m s}^{-1}$
(B) $105\ \text{m s}^{-1}$
(C) $90\ \text{m s}^{-1}$
(D) $60\ \text{m s}^{-1}$

Answer: (C) $90\ \text{m s}^{-1}$ · The council's preliminary key

Q33 AP EAPCET 2025 · 22 May · Shift 2 MCQ

When a stretched wire of fundamental frequency f is divided into three segments, the fundamental frequencies of these three segments are f_1, f_2 and f_3 respectively. Then the relation among f_1, f_2, f_3 and f is
(Assume tension is constant)

(A) $\sqrt{f} = \sqrt{f_1} + \sqrt{f_2} + \sqrt{f_3}$
(B) $f = f_1 + f_2 + f_3$
(C) $\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2} + \frac{1}{f_3}$
(D) $\frac{1}{\sqrt{f}} = \frac{1}{\sqrt{f_1}} + \frac{1}{\sqrt{f_2}} + \frac{1}{\sqrt{f_3}}$

Answer: (C) $\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2} + \frac{1}{f_3}$ · The council's preliminary key

Q34 AP EAPCET 2025 · 21 May · Shift 1 MCQ

Two sound waves of wavelengths 99 cm and 100 cm produce 10 beats in a time of t seconds. If the speed of sound in air is 330 m s^{-1}, then the value of t in seconds is

(A) 12
(B) 9
(C) 6
(D) 3

Answer: (D) 3 · The council's preliminary key

Q35 AP EAPCET 2025 · 21 May · Shift 1 MCQ

In a plane electromagnetic wave, the magnetic field is given by $\vec{B} = 3 \times 10^{-7} \sin(100\pi x + 10^{12}t)$ T, then the wavelength of the wave is (In the equation x is in metre and t is in second)

(A) 0.02 m
(B) 0.2 m
(C) 0.4 m
(D) 0.04 m

Answer: (A) 0.02 m · The council's preliminary key

Q36 AP EAPCET 2025 · 21 May · Shift 2 MCQ

The speed of a stationary wave represented by the equation

$$y = 0.7 \sin\left(\frac{7\pi}{4}x\right)\cos(350\pi t)$$

is

(In the given equation x and y are in metre and t is in second)

(A) $100\ \mathrm{m\,s^{-1}}$
(B) $150\ \mathrm{m\,s^{-1}}$
(C) $160\ \mathrm{m\,s^{-1}}$
(D) $200\ \mathrm{m\,s^{-1}}$

Answer: (D) $200\ \mathrm{m\,s^{-1}}$ · The council's preliminary key

Q37 AP EAPCET 2025 · 21 May · Shift 2 MCQ

For an observer on the earth, if a spectral line of wavelength 6600 Å emitted by a star is found to be red shifted by 22 Å, then the star is

(A) receding away from earth with a speed of $9 \times 10^5\ \mathrm{m\ s^{-1}}$
(B) receding away from earth with a speed of $10 \times 10^5\ \mathrm{m\ s^{-1}}$
(C) moving towards earth with a speed of $9 \times 10^5\ \mathrm{m\ s^{-1}}$
(D) moving towards earth with a speed of $10 \times 10^5\ \mathrm{m\ s^{-1}}$

Answer: (B) receding away from earth with a speed of $10 \times 10^5\ \mathrm{m\ s^{-1}}$ · The council's preliminary key

Q38 TS EAPCET 2025 · 4 May · Shift 1 MCQ

An air column in a tube of length 50 cm, closed at one end is vibrating in its fifth harmonic. The phase difference between a particle at the open end and a particle at 42 cm from the open end is

(A) 90°
(B) 180°
(C) 0°
(D) 270°

Answer: (C) 0° · The council's preliminary key

Q39 TS EAPCET 2025 · 4 May · Shift 1 MCQ

A metal rod of length 125 cm is clamped at its midpoint. If the speed of the sound in the metal is $5000\,\mathrm{ms^{-1}}$, then the fundamental frequency of the longitudinal vibrations of the rod is

EdLoop EAPCET

(A) 2 kHz
(B) 20 kHz
(C) 0.2 kHz
(D) 200 kHz

Answer: (A) 2 kHz · The council's preliminary key

Q40 TS EAPCET 2025 · 4 May · Shift 2 MCQ

The air columns in two tubes closed at one end vibrating in their fundamental modes produce 2 beats per second. The number of beats produced per second when the same tubes are vibrated in their fundamental mode with their both ends open are

(A) 1
(B) 2
(C) 3
(D) 4

Answer: (D) 4 · The council's preliminary key

Q41 TS EAPCET 2025 · 4 May · Shift 2 MCQ

A car moving towards a cliff emits sound of frequency 'n'. If the difference in frequencies of the horn and its echo heard by the driver of the car is 10 % of 'n', then the speed of the car is nearly

(Speed of sound in air is $336\,\mathrm{ms}^{-1}$)

(A) $16\,\mathrm{ms}^{-1}$
(B) $18\,\mathrm{ms}^{-1}$
(C) $30\,\mathrm{ms}^{-1}$
(D) $33\,\mathrm{ms}^{-1}$

Answer: (A) $16\,\mathrm{ms}^{-1}$ · The council's preliminary key

Q42 TS EAPCET 2025 · 3 May · Shift 1 MCQ

A sound wave of frequency 210 Hz travels with a speed of 330 ms^{-1} along the positive x-axis. Each particle of the wave moves a distance of 10 cm between the two extreme points. The equation of the displacement function (s) of this wave is (x in metre, t in second)

(A) $s(x,t) = 0.10\sin[4x - 1320t]\ \mathrm{m}$
(B) $s(x,t) = 0.05\sin[4x - 1320t]\ \mathrm{m}$
(C) $s(x,t) = 0.05\sin[1320x - 4t]\ \mathrm{m}$
(D) $s(x,t) = 0.10\sin[1320x - 4t]\ \mathrm{m}$

Answer: (B) $s(x,t) = 0.05\sin[4x - 1320t]\ \mathrm{m}$ · The council's preliminary key

Q43 TS EAPCET 2025 · 3 May · Shift 1 MCQ

A string vibrates in its fundamental mode when a tension T_1 is applied to it. If the length of the string is decreased by 25% and the tension applied is changed to T_2, the fundamental frequency of the string increases by 100%, then $\frac{T_2}{T_1} =$

(Linear density of the string is constant)

(A) $\frac{3}{8}$
(B) $\frac{2}{3}$
(C) $\frac{8}{9}$
(D) $\frac{9}{4}$

Answer: (D) $\frac{9}{4}$ · The council's preliminary key

Q44 TS EAPCET 2025 · 3 May · Shift 2 MCQ

Two tuning forks of frequencies 320 Hz and 323 Hz are vibrated together. The time interval between a maximum sound and its adjacent minimum sound heard by an observer is

(A) $\frac{1}{6}$ s
(B) $\frac{1}{3}$ s
(C) $\frac{1}{12}$ s
(D) $\frac{1}{9}$ s

Answer: (A) $\frac{1}{6}$ s · The council's preliminary key

Q45 TS EAPCET 2025 · 3 May · Shift 2 MCQ

The frequency of sound heard by an observer moving towards a stationary source with certain speed is n_1 and if the observer moves away from the same source with same speed, the frequency of sound heard by the observer is n_2. If the speed of sound in air is $340\,\mathrm{ms}^{-1}$ and $n_1 : n_2 = 71 : 65$, then speed of observer is

(A) 36 kmph
(B) 27 kmph
(C) 15 kmph
(D) 54 kmph

Answer: (D) 54 kmph · The council's preliminary key

Q46 TS EAPCET 2025 · 2 May · Shift 1 MCQ

The fundamental frequency of transverse wave of a stretched string subjected to a tension T_1 is 300 Hz. If the length of the string is doubled and subjected to a tension of T_2, the fundamental frequency of the transverse wave in the string becomes 100 Hz, then $\mathrm{T}_2 : \mathrm{T}_1$ =

(Linear density of the string is constant)

EdLoop EAPCET

(A) $1:2$
(B) $3:4$
(C) $2:3$
(D) $4:9$

Answer: (D) $4:9$ · The council's preliminary key

Q47 TS EAPCET 2025 · 2 May · Shift 1 MCQ

Two sound waves each of intensity I are superimposed. If the phase difference between the waves is $\frac{\pi}{2}$, then the intensity of the resultant wave is

(A) 2 I
(B) 3 I
(C) 4 I
(D) I

Answer: (A) 2 I · The council's preliminary key

Q48 TS EAPCET 2025 · 2 May · Shift 2 MCQ

If the lengths of the open and closed pipes are in the ratio of $2:3$, then the ratio of the frequencies of the third harmonic of the open pipe and the fifth harmonic of the closed pipe is

(A) $3:5$
(B) $9:5$
(C) $2:3$
(D) $4:9$

Answer: (B) $9:5$ · The council's preliminary key

Q49 TS EAPCET 2025 · 2 May · Shift 2 MCQ

The equation of a transverse wave propagating on a stretched string is given by $y = 3\sin(4x + 200t)$, where x and y are in metre and the time 't' is in second. If the tension applied to the string is 500 N, the linear density of the string is

(A) $0.25\ \text{kg m}^{-1}$
(B) $0.4\ \text{kg m}^{-1}$
(C) $0.2\ \text{kg m}^{-1}$
(D) $0.1\ \text{kg m}^{-1}$

Answer: (C) $0.2\ \text{kg m}^{-1}$ · The council's preliminary key

Q50 AP EAPCET 2024 · 23 May · Shift 1 MCQ

The frequency of fifth harmonic of a closed pipe is equal to the frequency of third harmonic of an open pipe. If the length of the open pipe is 72 cm, then the length of the closed pipe is

(A) 60 cm
(B) 45 cm
(C) 30 cm
(D) 75 cm

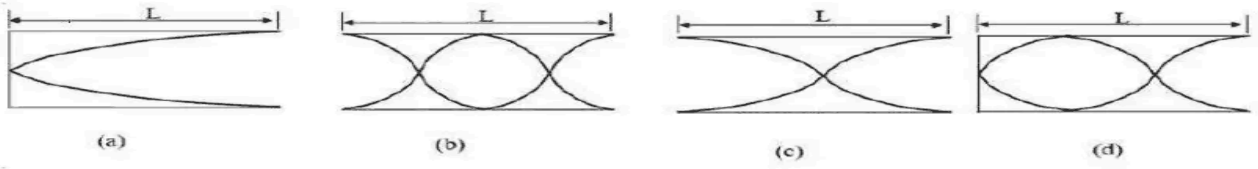
Answer: (A) 60 cm · The council's preliminary key

Q51 AP EAPCET 2024 · 22 May · Shift 1 MCQ

The vibrations of four air columns are shown below. The ratio of frequencies is

(see the figure above)

The vibrations of four air columns are shown below. The ratio of frequencies is
క్రింది పటంలో నాలుగు వాయుస్థంబాల కంపనాలు చూపబడినవి వాటి పౌనఃపున్యాల నిష్పత్తి



Options :

1. 1 : 2 : 3 : 4
2. 1 : 3 : 2 : 4
3. 1 : 4 : 3 : 2
4. 1 : 4 : 2 : 3

(A) $1 : 2 : 3 : 4$
(B) $1 : 3 : 2 : 4$
(C) $1 : 4 : 3 : 2$
(D) $1 : 4 : 2 : 3$

Answer: (D) $1 : 4 : 2 : 3$ · The council's preliminary key

Q52 AP EAPCET 2024 · 22 May · Shift 2 MCQ

The fundamental frequency of an open pipe is 100 Hz. If the bottom end of the pipe is closed and $\frac{1}{3}$rd of the pipe is filled with water, then the fundamental frequency of the pipe is

(A) 200 Hz
(B) 100 Hz
(C) 75 Hz
(D) 150 Hz

Answer: (C) 75 Hz · The council's preliminary key

Q53 AP EAPCET 2024 · 21 May · Shift 1 MCQ

A car sounding a horn of frequency 1000 Hz passes a stationary observer. The ratio of frequencies of the horn noted by the observer before and after passing of the car is $11 : 9$. The speed of car is (Speed of sound $v = 340\ \mathrm{ms}^{-1}$)

(A) $34\ \mathrm{ms}^{-1}$
(B) $17\ \mathrm{ms}^{-1}$
(C) $170\ \mathrm{ms}^{-1}$
(D) $340\ \mathrm{ms}^{-1}$

Answer: (A) $34\ \mathrm{ms}^{-1}$ · The council's preliminary key

Q54 AP EAPCET 2024 · 20 May · Shift 1 MCQ

If the frequency of a wave is increased by 25%, then the change in its wavelength is (medium not changed)

(A) 20% increase
(B) 20% decrease
(C) 25% increase
(D) 25% decrease

Answer: (B) 20% decrease · The council's preliminary key

Q55 AP EAPCET 2024 · 20 May · Shift 2 MCQ

A pipe with 30 cm Length is open at both ends. Which harmonic mode of the pipe resonates a 1.65 kHz source? (Velocity of sound in air = 330 ms^{-1})

(A) 2
(B) 3
(C) 3.5
(D) 2.5

Answer: (B) 3 · The council's preliminary key

Q56 AP EAPCET 2024 · 19 May · Shift 2 MCQ

The speed of a wave on a string is $150\ \mathrm{ms}^{-1}$ when the tension is 120 N. The percentage increase in the tension in order to raise the wave speed by 20% is

(A) 44
(B) 40
(C) 22
(D) 20

Answer: (A) 44 · The council's preliminary key

Q57 AP EAPCET 2024 · 18 May · Shift 1 MCQ

Two stretched strings A and B when vibrated together produce 4 beats per second. If the tension applied to the string A increased, the number of beats produced per second is increased to 7. If the frequency of string B is 480 Hz initially, the frequency of string A is

(A) 473 Hz
(B) 476 Hz
(C) 484 Hz
(D) 487 Hz

Answer: (C) 484 Hz · The council's preliminary key

Q58 TS EAPCET 2024 · 11 May · Shift 1 MCQ

The tension applied to a metal wire of one metre length produces an elastic strain of 1%. The density of the metal is $8000\ \mathrm{kgm^{-3}}$ and Young's modulus of the metal is $2 \times 10^{11}\ \mathrm{Nm^{-2}}$. The fundamental frequency of the transverse waves in the metal wire is

(A) $500\ \mathrm{Hz}$
(B) $375\ \mathrm{Hz}$
(C) $250\ \mathrm{Hz}$
(D) $125\ \mathrm{Hz}$

Answer: (C) $250\ \mathrm{Hz}$ · The council's preliminary key

---

Q59 TS EAPCET 2024 · 11 May · Shift 1 MCQ

Two closed pipes when sounded simultaneously in their fundamental modes produce 6 beats per second. If the length of the shorter pipe is 150 cm, then the length of the longer pipe is

(Speed of sound in air = $336\ \mathrm{ms^{-1}}$)

(A) 168 cm
(B) 184 cm
(C) 176 cm
(D) 192 cm

Answer: (A) 168 cm · The council's preliminary key

EdLoop EAPCET

Q60 TS EAPCET 2024 · 10 May · Shift 1 MCQ

The difference between the fundamental frequencies of an open pipe and a closed pipe of same length is $100\ \text{Hz}$. The difference between the frequencies of the second harmonic of the open pipe and the third harmonic of the closed pipe is

(A) $100\ \text{Hz}$
(B) $150\ \text{Hz}$
(C) $200\ \text{Hz}$
(D) $250\ \text{Hz}$

Answer: (A) $100\ \text{Hz}$ · The council's preliminary key

Q61 TS EAPCET 2024 · 10 May · Shift 1 MCQ

The displacement equations of sound waves produced by two sources are given by $y_1 = 5\sin 400\pi t$ and $y_2 = 8\sin 408\pi t$, where 't' is time in seconds. If the waves are produced simultaneously, the number of beats produced per minute is

(A) 4
(B) 8
(C) 120
(D) 240

Answer: (D) 240 · The council's preliminary key

Q62 TS EAPCET 2024 · 10 May · Shift 2 MCQ

The path difference between two particles of a sound wave is 50 cm and the phase difference between them is 1.8π. If the speed of sound in air is $340\ \text{ms}^{-1}$, the frequency of the sound wave is

(A) 672 Hz
(B) 306 Hz
(C) 612 Hz
(D) 340 Hz

Answer: (C) 612 Hz · The council's preliminary key

Q63 TS EAPCET 2024 · 10 May · Shift 2 MCQ

A source at rest emits sound waves of frequency 102 Hz. Two observers are moving away from the source of sound in opposite directions each with a speed of 10 % of the speed of sound. The ratio of the frequencies of sound heard by the observers is

(A) $9 : 11$
(B) $1 : 1$
(C) $7 : 9$
(D) $2 : 3$

Answer: (B) $1 : 1$ · The council's preliminary key

Q64 TS EAPCET 2024 · 9 May · Shift 1 MCQ

A car travelling at a speed of 54 kmph towards a wall sounds horn of frequency 400 Hz. The difference in the frequencies of two sounds, one received directly from the car and other reflected from the wall noticed by a person standing between the car and the wall is
(speed of sound in air is 335 ms^{-1})

(A) 35.9 Hz
(B) 20 Hz
(C) 70 Hz
(D) Zero

Answer: (D) Zero · The council's preliminary key

Q65 TS EAPCET 2024 · 9 May · Shift 1 MCQ

The speed of a transverse wave in a stretched string 'A' is 'v'. Another string 'B' of same length and same radius is subjected to same tension. If the density of the material of the string 'B' is 2% more than that of 'A', then the speed of the transverse wave in string 'B' is

(A) $\sqrt{1.04}\,v$
(B) $\sqrt{1.02}\,v$
(C) $\frac{v}{\sqrt{1.04}}$
(D) $\frac{v}{\sqrt{1.02}}$

Answer: (D) $\frac{v}{\sqrt{1.02}}$ · The council's preliminary key

Q66 TS EAPCET 2024 · 9 May · Shift 2 MCQ

A boy standing on a platform observes the frequency of a train horn as it passes by. The change in the frequency noticed as the train approaches and recedes him with a velocity of 108 kmph is (speed of sound in air = 330 ms^{-1})

(A) 18.33%
(B) 16.67%
(C) 21.27%
(D) 15.23%

Options (2) or (1) were accepted. More than one answer was accepted. · The council's preliminary key

Q67 TS EAPCET 2024 · 9 May · Shift 2 MCQ

If three sources of sound of frequencies $(n-1)$, n and $(n+1)$ are vibrated together, the number of beats produced and heard per second respectively are

(A) 4 and 2
(B) 4 and 4
(C) 2 and 2
(D) 2 and 4

Answer: (A) 4 and 2 · The council's preliminary key

Q68 AP EAPCET 2023 · 19 May · Shift 1 MCQ

During the propagation of a longitudinal wave, in the region of compressions and rarefactions

(A) density varies
(B) density remains constant
(C) there is heat transfer
(D) Boyle's law is obeyed

Answer: (A) density varies · The council's preliminary key

Q69 AP EAPCET 2023 · 18 May · Shift 1 MCQ

The mass of one mole of a gas is 22.4×10^{-3} kg and its specific heat ratio is 1.6. The speed of sound in the gas at STP is nearly

(A) 402
(B) 292
(C) 302
(D) 312

Answer: (A) 402 · The council's preliminary key

Q70 AP EAPCET 2023 · 18 May · Shift 2 MCQ

The equation of a stationary wave is $y = 20\sin(\pi x)\cos(\omega t)$, where x, y are in metre and t is in second. The distance between a node and its adjacent antinode is

(A) 25 cm
(B) 100 cm
(C) 50 cm
(D) 200 cm

Answer: (C) 50 cm · The council's preliminary key

Q71 AP EAPCET 2023 · 17 May · Shift 1 MCQ

The ratio of radii of two wires is $1:2$ and the density of their materials are in the ratio $1:4$. If same tension is applied to both the wires then the ratio of the speed of transverse waves produced in them is

(A) $1:16$
(B) $16:1$
(C) $1:4$
(D) $4:1$

Answer: (D) $4:1$ · The council's preliminary key

Q72 AP EAPCET 2023 · 17 May · Shift 2 MCQ

A standing wave having 3 nodes and 2 antinodes is formed between two atoms having a distance $1.21\ \text{Å}$ between then. The wavelength of the standing wave is

(A) $1.21\ \text{Å}$
(B) $2.42\ \text{Å}$
(C) $6.05\ \text{Å}$
(D) $3.63\ \text{Å}$

Answer: (A) $1.21\ \text{Å}$ · The council's preliminary key

Q73 AP EAPCET 2023 · 16 May · Shift 1 MCQ

The amplitude of a wave, represented by displacement equation $y = \frac{1}{\sqrt{a}}\sin\omega t \pm \frac{1}{\sqrt{b}}\cos\omega t$ will be

(A) $\frac{a+b}{ab}$
(B) $\frac{\sqrt{a}+\sqrt{b}}{ab}$
(C) $\frac{\sqrt{a}\pm\sqrt{b}}{ab}$
(D) $\sqrt{\frac{a+b}{ab}}$

Answer: (D) $\sqrt{\frac{a+b}{ab}}$ · The council's preliminary key

Q74 AP EAPCET 2023 · 16 May · Shift 2 MCQ

Beats are produced by frequencies v_1 and v_2 $(v_1 > v_2)$. The duration of time between two successive minima is

(A) $\frac{1}{v_1 + v_2}$
(B) $\frac{2}{v_1 - v_2}$
(C) $\frac{2}{v_1 + v_2}$
(D) $\frac{1}{v_1 - v_2}$

Answer: (D) $\frac{1}{v_1 - v_2}$ · The council's preliminary key

Q75 AP EAPCET 2023 · 15 May · Shift 1 MCQ

Small amplitude progressive wave in a stretched string has a speed of $100\ \mathrm{cms}^{-1}$, and frequency 100 Hz. The phase difference between two points 2.75 cm apart on the string, in radians, is

(A) 0
(B) $11\frac{\pi}{2}$
(C) $\frac{\pi}{4}$
(D) $\frac{3\pi}{8}$

Answer: (B) $11\frac{\pi}{2}$ · The council's preliminary key

Q76 AP EAPCET 2023 · 15 May · Shift 2 MCQ

A string of length 'L' is stretched by $\frac{L}{20}$ and the speed of transverse waves along it is 'v'. The speed of wave when it is stretched by $\frac{L}{10}$ will be

(assume that Hooke's law is applicable)

(A) $2\mathrm{v}$
(B) $\frac{\mathrm{v}}{\sqrt{2}}$
(C) $\mathrm{v}\sqrt{2}$
(D) $4\mathrm{v}$

Answer: (C) $\mathrm{v}\sqrt{2}$ · The council's preliminary key

Q77 TS EAMCET 2023 · 14 May · Shift 1 MCQ

Among the following statements, the correct statement for a wave is

(A) Transverse waves cannot propagate through all media
(B) Longitudinal waves can propagate through solids only
(C) Transverse waves can propagate through solids
(D) Longitudinal waves can propagate through vacuum

Answer: (C) Transverse waves can propagate through solids · The council's preliminary key

Q78 TS EAMCET 2023 · 14 May · Shift 1 MCQ

A source and an observer move away from each other with same velocity of $10\ \mathrm{ms}^{-1}$ with respect to ground. If the observer finds the frequency of sound coming from the source as 1980 Hz, then actual frequency of the source is
(speed of sound in air = $340\ \mathrm{ms}^{-1}$)

(A) 1950 Hz
(B) 2100 Hz
(C) 2132 Hz
(D) 2486 Hz

Answer: (B) 2100 Hz · The council's preliminary key

Q79 TS EAMCET 2023 · 14 May · Shift 2 MCQ

A source emitting sound is tied to one end of a string of length 50 cm and is rotated with an angular speed of 40 rad s^{-1} in the horizontal plane. The ratio of the maximum and minimum frequencies of the sound heard by an observer standing at a distance of 10 m from the fixed end of the string is (speed of sound in air = 340 ms^{-1})

(A) 2:1
(B) 4:3
(C) 6:5
(D) 9:8

Answer: (D) 9:8 · The council's preliminary key

Q80 TS EAMCET 2023 · 14 May · Shift 2 MCQ

One end of a string is tied to the ceiling of a lift and a load is attached at the bottom end of the string. When the lift is moving upwards with an acceleration of $2.1\ \mathrm{ms}^{-2}$, the speed of the transverse wave at the lower end of the string is $88\ \mathrm{ms}^{-1}$. If the lift moves downwards with an acceleration of $1.9\ \mathrm{ms}^{-2}$, the speed of the transverse wave at the lower end of the string is ($g = 10\ \mathrm{ms}^{-2}$)

(A) $88\,\mathrm{ms}^{-1}$
(B) $102\,\mathrm{ms}^{-1}$
(C) $119\,\mathrm{ms}^{-1}$
(D) $72\,\mathrm{ms}^{-1}$

Answer: (D) $72\,\mathrm{ms}^{-1}$ · The council's preliminary key

Q81 TS EAMCET 2023 · 13 May · Shift 1 MCQ

If the seventh harmonic of a closed organ pipe is in unison with fourth harmonic of an open organ pipe, then the ratio of length of closed pipe to that of open pipe is

(A) 4:7
(B) 7:4
(C) 8:7
(D) 7:8

Answer: (D) 7:8 · The council's preliminary key

Q82 TS EAMCET 2023 · 13 May · Shift 1 MCQ

An observer moves towards a stationary source of sound, with a speed of one-fifth of the speed of sound. The apparent increase in the frequency heard by the observer is

(A) 16.67%
(B) 2%
(C) 25%
(D) 20%

Answer: (D) 20% · The council's preliminary key

Q83 TS EAMCET 2023 · 13 May · Shift 2 MCQ

A wave is given by $y = 5 \times 10^{-3} \sin\left(12.5\pi x - \frac{\pi}{2}t\right)$. Then its wavelength and time period are respectively
(y and x are in metres and t is in seconds)

(A) 0.04 m, 4 s
(B) 0.16 m, 1 s
(C) 0.04 m, 2 s
(D) 0.16 m, 4 s

Answer: (D) 0.16 m, 4 s · The council's preliminary key

EdLoop EAPCET

Q84 TS EAMCET 2023 · 13 May · Shift 2 MCQ

A tuning fork 'A' of frequency 250 Hz and another tuning fork 'B' of frequency 'x' produced 5 beats per second when vibrated together. If the fork 'B' is waxed and vibrated together with 'A', then 3 beats per second are produced. Then x =

(A) 255 Hz
(B) 245 Hz
(C) 247 Hz
(D) 253 Hz

Answer: (A) 255 Hz · The council's preliminary key

Q85 TS EAMCET 2023 · 12 May · Shift 1 MCQ

A heavy uniform rope is suspended vertically from a ceiling and is in equilibrium. A pulse is generated at the bottom end of the rope as shown. As the pulse travels up the rope, its acceleration at any instant is
(g is acceleration due to gravity)

(see the figure above)

A heavy uniform rope is suspended vertically from a ceiling and is in equilibrium. A pulse is generated at the bottom end of the rope as shown. As the pulse travels up the rope, its acceleration at any instant is
(g is acceleration due to gravity)
ఒక భారీ ఏకరీతి తాడు పైకప్పు నుండి నిలువుగా క్రిందికి వేలాడతీయబడింది మరియు సమతాస్థితిలో ఉంది. చిత్రంలో చూపిన విధంగా తాడు యొక్క క్రింది చివర ఒక తరంగం ఉత్పత్తి చేయబడింది.
తరంగం తాడులో పైకి ప్రయాణిస్తున్నప్పుడు, ఏ క్షణంలోనైనా దాని త్వరణం
(g అనేది గురుత్వ త్వరణం)



Options :

1. Constant and equal to $\frac{g}{2}$
స్థిరంగా ఉంటుంది మరియు $\frac{g}{2}$ కి సమానం

2. Variable but equal to $\frac{g}{2}$ when the pulse is exactly at the middle of the string
స్థిరమైనది కాదు, కానీ తరంగం సరిగ్గా తాడు మధ్యలో ఉన్నప్పుడు $\frac{g}{2}$ కి సమానం

3. Constant and equal to g
స్థిరంగా ఉంటుంది మరియు g కి సమానం

4. Variable but equal to g when the pulse is exactly at the middle of the string.
స్థిరమైనది కాదు, కానీ తరంగం సరిగ్గా తాడు మధ్యలో ఉన్నప్పుడు 'g' కి సమానం.

(A) Constant and equal to $\frac{g}{2}$
(B) Variable but equal to $\frac{g}{2}$ when the pulse is exactly at the middle of the string
(C) Constant and equal to g
(D) Variable but equal to g when the pulse is exactly at the middle of the string.

Answer: (A) Constant and equal to $\frac{g}{2}$ · The council's preliminary key

Q86 TS EAMCET 2023 · 12 May · Shift 1 MCQ

A wave is given by the equation $y = (0.02)\sin(\pi x - 8\pi t)$ then the velocity of the wave is (y and x are in metre and t is in second)

(A) $16\ \text{ms}^{-1}$
(B) $2\ \text{ms}^{-1}$
(C) $8\ \text{ms}^{-1}$
(D) $18\ \text{ms}^{-1}$

Answer: (C) $8\ \text{ms}^{-1}$ · The council's preliminary key

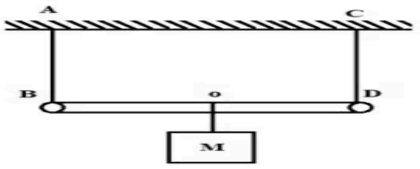
Q87 TS EAMCET 2023 · 12 May · Shift 2 MCQ

A rod of length 'L' and negligible mass is suspended by two identical strings AB and CD as shown in the figure. A mass 'M' is suspended from point 'o' which is at a distance 'x' from B. If the frequency of the first harmonic of AB is equal to the frequency of the second harmonic of CD, then the value of 'x' is

(see the figure above)

A rod of length 'L' and negligible mass is suspended by two identical strings AB and CD as shown in the figure. A mass 'M' is suspended from point 'o' which is at a distance 'x' from B. If the frequency of the first harmonic of AB is equal to the frequency of the second harmonic of CD, then the value of 'x' is

ద్రవ్యరాశి రహిత 'L' పొడవు గల ఒక కడీని సమాన పొడవు గల రెండు తంత్రులు AB, CD లతో పటంలో చూపినట్లు వ్రేలాడదీసారు. B నుండి 'x' దూరంలో ఉన్న బిందువు 'o'వద్ద ద్రవ్యరాశి 'M' ను కడ్డీకి వ్రేలాడదీసారు. AB నందు మొదటి అనుస్వర పౌనఃపున్యము CD నందు రెండవ అనుస్వర పౌనఃపున్యానికి సమానమయిన 'x' విలువ



Options :

1. $\frac{L}{5}$
2. $\frac{2L}{7}$
3. $\frac{3L}{10}$
4. $\frac{L}{9}$

(A) $\frac{L}{5}$
(B) $\frac{2L}{7}$
(C) $\frac{3L}{10}$
(D) $\frac{L}{9}$

Answer: (A) $\frac{L}{5}$ · The council's preliminary key

Q88 TS EAMCET 2023 · 12 May · Shift 2 MCQ

An observer moves towards a stationary source of sound with a speed $\frac{1}{5}$th that of sound. The frequency of the sound emitted by the source is f. The apparent frequency recorded by the observer is

(A) $1.2f$
(B) f
(C) $0.8f$
(D) $2f$

Answer: (A) $1.2f$ · The council's preliminary key

Q89 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

Which of the following wave has the largest wave speed?

(A) $y(x,t) = 2\sin(2x - 2t)$
(B) $y(x,t) = 3\sin(2x - 3t)$
(C) $y(x,t) = 2\sin(3x - 2t)$
(D) $y(x,t) = 3\sin(5x - 2t)$

Answer: (B) $y(x,t) = 3\sin(2x - 3t)$ · The council's preliminary key

Q90 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

A cylindrical 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 new fundamental frequency is

(A) f
(B) $\frac{f}{2}$
(C) 2f
(D) 4f

Answer: (A) f · The council's preliminary key

Q91 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

Two strings A and B produce beat of frequency $\Delta f_1 > 0$. The tension in string A is slightly increased and the beat frequency is found to be $\Delta f_2 > 0$. If the original frequency of A is f_0 and $\Delta f_2 < \Delta f_1$, then the frequency of B is

(A) $f_0 + \Delta f_1$
(B) $f_0 + \Delta f_1 - \Delta f_2$
(C) $f_0 - \Delta f_1$
(D) $f_0 + \frac{(\Delta f_1 + \Delta f_2)}{2}$

Answer: (A) $f_0 + \Delta f_1$ · The council's preliminary key

Q92 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

A wire of length 0.4 m stretched at both ends vibrates 250 times per second. If the length of the wire is increased by 0.1 m and the stretching force is reduced to $1/4^{\text{th}}$ of its original value then the new frequency is

(A) 50 Hz
(B) 75 Hz
(C) 100 Hz
(D) 150Hz

Answer: (C) 100 Hz · The council's preliminary key

Q93 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

The distance between two successive minima of a transverse wave is 2.7 m. Five crests of the wave pass a given point along the direction of travel every 15.0 s. The speed of the wave is

(A) 0.9 m/s
(B) 1.2 m/s
(C) 0.5 m/s
(D) 2.4 m/s

Answer: (A) 0.9 m/s · The council's preliminary key

Q94 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

An open air pipe of length 80 cm has the second harmonic frequency equal to the fundamental frequency of a closed organ air pipe. The length of the closed pipe is

(A) $20\ \text{cm}$
(B) $40\ \text{cm}$
(C) $60\ \text{cm}$
(D) $10\ \text{cm}$

Answer: (A) $20\ \text{cm}$ · The council's preliminary key

Q95 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

Two wires A and B of lengths in the ratio 1:2 and masses in the ratio 2:1 are stretched by same tension. The ratio of the fundamental frequencies of wires A and B is

(A) $2\sqrt{2} : 1$
(B) $1 : \sqrt{2}$
(C) $1 : 1$
(D) $\sqrt{2} : 1$

Answer: (C) $1 : 1$ · The council's preliminary key

Q96 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

Two trains A and B are moving towards each other with speeds $72\ \mathrm{kmh}^{-1}$ and $36\ \mathrm{kmh}^{-1}$ respectively. The train-A whistles at 640 Hz frequency. Before the trains meet, frequency of sound heard by a passenger in Train-B is (Speed of sound in air = $340\ \mathrm{ms}^{-1}$)

(A) 500 Hz
(B) 600 Hz
(C) 700 Hz
(D) 800 Hz

Answer: (C) 700 Hz · The council's preliminary key

Q97 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

A steel wire of length 1.25 m is stretched between two rigid supports. The tension in the wire produces an elastic strain of 0.14%. The fundamental frequency of the wire is
(Density and Young's modules (sic) of steel are $7.7 \times 10^3\ \mathrm{kgm}^{-3}$ and $2.2 \times 10^{11}\ \mathrm{Nm}^{-2}$ respectively)

(A) 20 Hz
(B) 40 Hz
(C) 80 Hz
(D) 160 Hz

Answer: (C) 80 Hz · The council's preliminary key

Q98 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

A string of length 1 m and mass 490 g is put under a tension of 25 N. A wave of frequency 120 Hz is sent along it. The speed of this wave is

(A) $7.14\ \mathrm{ms}^{-1}$
(B) $0.71\ \mathrm{ms}^{-1}$
(C) $0.51\ \mathrm{ms}^{-1}$
(D) $51.0\ \mathrm{ms}^{-1}$

Answer: (A) $7.14\ \mathrm{ms}^{-1}$ · The council's preliminary key

Q99 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

Two open organ pipes of lengths 50 cm and 51 cm are totally immersed in a medium. They are found to give 40 beats in 10 s when each is sounding at its fundamental note. The speed of sound in this medium is

(A) $275\ \mathrm{ms}^{-1}$
(B) $310\ \mathrm{ms}^{-1}$
(C) $258\ \mathrm{ms}^{-1}$
(D) $204\ \mathrm{ms}^{-1}$

Answer: (D) $204\ \mathrm{ms}^{-1}$ · The council's preliminary key

Q100 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

Two cars are moving towards each other at the speed of $50\ \mathrm{m\,s}^{-1}$. If one of the cars blows a horn at a frequency of 250 Hz, the wave length of the sound perceived by the driver of the other car is (Speed of sound in air $= 350\ \mathrm{m\,s}^{-1}$)

(A) 18.7 cm
(B) 105 cm
(C) 75 cm
(D) 10.5 cm

Answer: (B) 105 cm · The council's preliminary key

Q101 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

Among the following, the equation representing a progressive wave is

(A) $y = 2\cos 3x \sin 10t$

(B) $y = 2\sqrt{x - vt}$

(C) $y = 3\sin(5x - 0.5t) + 4\cos(5x - 0.5t)$

(D) $y = \cos x \sin t + \cos 2x \cdot \sin 2t$

(A) A and D
(B) C
(C) A, C, D
(D) B

Answer: (B) C · The council's preliminary key

Q102 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

A body is suspended from a string of length 1 m and mass 2 g. The mass of the body to produce a fundamental mode of 100 Hz frequency in the string is
(Acceleration due to gravity = 10 ms^{-2})

(A) 80 g
(B) 4 kg
(C) 400 g
(D) 8 kg

Answer: (D) 8 kg · The council's preliminary key

Q103 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

Speed of sound in air near room temperature is approximately

(A) $3.4 \times 10^2\ \mathrm{m\,s}^{-1}$
(B) $34\ \mathrm{m\,s}^{-1}$
(C) $34\ \mathrm{km\,s}^{-1}$
(D) $3.4\ \mathrm{km\,s}^{-1}$

Answer: (A) $3.4 \times 10^2\ \mathrm{m\,s}^{-1}$ · The council's preliminary key

Q104 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

An elastic string of length 2 m is fixed at one end. The string starts to vibrate in third overtone with a frequency 1200 Hz. The ratio of frequency of first overtone and fundamental is

(A) $1:1$
(B) $2:1$
(C) $3:1$
(D) $4:1$

Answer: (C) $3:1$ · The council's preliminary key

Q105 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

Speed of a sound in air _____

EdLoop EAPCET

(A) is independent of temperature
(B) increases with pressure
(C) increases with increase in humidity
(D) decreases with increase in humidity

Answer: (C) increases with increase in humidity · The council's preliminary key

Q106 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

At what temperature does the velocity of sound in air increase by 10% in comparision (sic) with velocity at $0^{\circ}\mathrm{C}$?

(A) $45^{\circ}\mathrm{C}$
(B) $57^{\circ}\mathrm{C}$
(C) $27^{\circ}\mathrm{C}$
(D) $18^{\circ}\mathrm{C}$

Answer: (B) $57^{\circ}\mathrm{C}$ · The council's preliminary key

Q107 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

The speed of the sound in Oxygen O_2 at a certain temperature is $460\ \mathrm{m.s^{-1}}$. The speed of the sound in Helium He at the same temperature will be _____ (assume both the gasses to be ideal)

(A) $330\ \mathrm{m.s^{-1}}$
(B) $1420\ \mathrm{m.s^{-1}}$
(C) $500\ \mathrm{m.s^{-1}}$
(D) $650\ \mathrm{m.s^{-1}}$

Answer: (B) $1420\ \mathrm{m.s^{-1}}$ · The council's preliminary key

Q108 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

Two identical sinusoidal waves each of amplitude $10\ mm$, with a phase difference of 90° are travelling with the same direction in a string. The amplitude of the resultant wave is _____

(A) $5\ mm$
(B) $10\sqrt{2}\ mm$
(C) $5\sqrt{2}\ mm$
(D) $20\ mm$

Answer: (B) $10\sqrt{2}\ mm$ · The council's preliminary key

Q109 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

A string is divided into three segments, so that the segment possesses fundamental frequencies in the ratio $1:2:3$. Then, the length of the segments are in the ratio _____

EdLoop EAPCET

(A) $6:3:2$
(B) $4:3:2$
(C) $4:2:1$
(D) $3:2:1$

Answer: (A) $6:3:2$ · The council's preliminary key

Q110 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

What causes the formation of beats in sound?

(A) Dispersion
(B) Reflection
(C) Refraction
(D) Interference

Answer: (D) Interference · The council's preliminary key

Q111 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

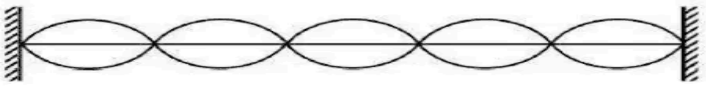
A string fixed at both ends vibrates in 5 loops as shown in the figure. The total number of nodes and antinodes respectively are _____. *(see the figure above)*

AP EAPCET 2021
AP EAPCET 2021

Mandatory : No

A string fixed at both ends vibrates in 5 loops as shown in the figure. The total number of nodes and antinodes respectively are _____

పటములో చూపిన విధముగా రెండు కొనల వద్ద బిగించబడిన ఒక తీగ 5 ఉచ్చులతో కంపిస్తుంది. అయితే, మొత్తము అస్పందన మరియు ప్రస్పందన బిందువుల సంఖ్య వరుసగా _____



Options :

1. 6 & 5
2. 6 & 10
3. 2 & 5
4. 10 & 6

(A) $6 \& 5$
(B) $6 \& 10$
(C) $2 \& 5$
(D) $10 \& 6$

Answer: (A) $6 \& 5$ · The council's preliminary key

Q112 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

The sources of sound A and B produce a wave of $350\ Hz$ in same phase. A particle P is vibrating under an influence of these two waves. If the amplitudes at P produced by the two waves is $0.3\ mm$ and $0.4\ mm$, the resultant amplitude of the point P will be, when $AP - BP = 25\ cm$ and the velocity of sound is $350\ m.s^{-1}$,

(A) $0.7\ mm$
(B) $0.1\ mm$
(C) $0.2\ mm$
(D) $0.5\ mm$

Answer: (D) $0.5\ mm$ · The council's preliminary key

Q113 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Match the following:
A) Transverse wave through a steel rod
B) Longitudinal waves in earth's crust
C) Longitudinal waves through a steel rod
D) Ripples
I) $\sqrt{B + \left(\frac{4}{3}\right)\frac{\eta}{\rho}}$
II) $\sqrt{\frac{\eta}{\rho}}$
III) $\sqrt{\frac{2\pi T}{g\lambda}}$
IV) $\sqrt{\frac{\lambda}{\rho}}$

(A) A-II, B-I, C-IV, D-III
(B) A-I, B-III, C-IV, D-II
(C) A-III, B-IV, C-I, D-II
(D) A-II, B-IV, C-I, D-III

Answer: (A) A-II, B-I, C-IV, D-III · The council's preliminary key

Q114 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

A wire vibrates at a fundamental frequency of 500 Hz. A second identical wire produces 5 beats per second with it when the tension in the first wire is slightly decreased. The ratio of the tension in the second wire to the tension in the first wire is approximately equal to:

EdLoop EAPCET

(A) 1.04
(B) 1.01
(C) 1.05
(D) 1.02

Answer: (D) 1.02 · The council's preliminary key

Q115 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

Two identical wires have a fundamental frequency f_0 when kept under the same tension T. If the tension of one wire is increased by ΔT, then the N beats/s occur when both wires oscillate simultaneously. The correct statement is

(A) $\frac{\Delta T}{T} = \left(\frac{f_0 + N}{f_0}\right)^2 - 1$
(B) $\frac{\Delta T}{T} = \left(\frac{f_0}{f_0 - N}\right)^2 - 1$
(C) $\frac{\Delta T}{T} = \left(\frac{f_0 - N}{f_0}\right)^2 + 1$
(D) $\frac{\Delta T}{T} = \left(\frac{f_0 + N}{f_0}\right)^2$

Answer: (A) $\frac{\Delta T}{T} = \left(\frac{f_0 + N}{f_0}\right)^2 - 1$ · The council's preliminary key

Q116 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

A second wave of frequency 200 Hz is travelling in air. The speed of sound in the air is 340 m/s. What is the phase difference at a given instant between two points separated by a distance of 85 cm along the direction of propagation?

(A) π
(B) 2π
(C) $\frac{\pi}{2}$
(D) $\frac{\pi}{4}$

Answer: (A) π · The council's preliminary key

Q117 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

The amplitude of the wave resulting from the superposition of three waves given by $x_1 = A\cos\omega t$, $x_2 = 2A\sin\omega t$ and $x_3 = \sqrt{2}A\cos\left(\omega t + \frac{\pi}{4}\right)$ is

(A) $\sqrt{7}A$
(B) $\sqrt{5}A$
(C) $(3+\sqrt{2})A$
(D) $\sqrt{2}A$

Answer: (B) $\sqrt{5}A$ · The council's preliminary key

Q118 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

Which of the following is not a transverse wave?

(A) Light waves
(B) Sound waves
(C) Waves on a violin string
(D) Water waves

Answer: (B) Sound waves · The council's preliminary key

Q119 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

A wave is represented by the equation $y = (0.02\ \text{m})\sin(5\pi x - 20t)$. The minimum distance between the two particles always having the same speed is. (Assume x and t are in SI units)

(A) 0.02 m
(B) 0.4 m
(C) 0.8 m
(D) 0.2 m

Answer: (D) 0.2 m · The council's preliminary key

Q120 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

Consider a gas with molar mass M. If the sound at frequency f is introduced to a tube of this gas at temperature T then an internal acoustic standing wave is set up with nodes separated by L. The adiabatic constant $(\gamma = C_p/C_v)$ is

(A) $\frac{Mf^2L^2}{RT}$
(B) $\frac{Mf^2L^2}{4RT}$
(C) $\frac{4Mf^2L^2}{RT}$
(D) $\frac{3Mf^2L^2}{2RT}$

Answer: (C) $\frac{4Mf^2L^2}{RT}$ · The council's preliminary key

Q121 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

Two vibrating strings 'A' and 'B' produce beats of frequency 8 Hz. The beat frequency is found to reduce to 4 Hz if the tension in the string 'A' is slightly reduced. If the original frequency of A is 320 Hz, then the frequency of 'B' is

(A) $324\ \text{Hz}$
(B) $312\ \text{Hz}$
(C) $316\ \text{Hz}$
(D) $328\ \text{Hz}$

Answer: (B) $312\ \text{Hz}$ · The council's preliminary key

Q122 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

A wave is represented by $x = 0.4\cos\left(8t - \frac{y}{2}\right)$ where x and y are in meters and t in secs. The speed of the wave is

(A) $0.5\ m.s^{-1}$
(B) $8\ m.s^{-1}$
(C) $16\ m.s^{-1}$
(D) $0.1\ m.s^{-1}$

Answer: (C) $16\ m.s^{-1}$ · The council's preliminary key

Q123 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

A closed organ pipe and an open organ pipe of same length produce 2 beats/sec when they are set into vibrations together in fundamental mode. The length of open pipe is now halved and that of closed pipe is doubled. The number of beats produced will be

(A) 7
(B) 4
(C) 8
(D) 2

Answer: (A) 7 · The council's preliminary key

Q124 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

A source is stationary and the observer is in motion along a line joining the source and the observer. If the frequency heard by the observer is 1% higher than the true frequency, the ratio of velocity of the observer and that of sound in air is:

EdLoop EAPCET

(A) $1 : 100$
(B) $2 : 100$
(C) $3 : 100$
(D) $1 : 10$

Answer: (A) $1 : 100$ · The council's preliminary key

Q125 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

The displacement y (in cm) in case of a simple harmonic wave is given by $y = \frac{10}{\pi} \sin\left(2000\pi t - \frac{\pi x}{17}\right)$. The period and maximum velocity of the particles in the medium will respectively be _____

(A) $10^{-3}\ \mathrm{s},\ 330\ \mathrm{m.s^{-1}}$
(B) $10^{-4}\ \mathrm{s},\ 20\ \mathrm{m.s^{-1}}$
(C) $10^{-3}\ \mathrm{s},\ 200\ \mathrm{m.s^{-1}}$
(D) $10^{-2}\ \mathrm{s},\ 2000\ \mathrm{m.s^{-1}}$

Answer: (C) $10^{-3}\ \mathrm{s},\ 200\ \mathrm{m.s^{-1}}$ · The council's preliminary key

Q126 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

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

(A) $+3\ \%$
(B) $-3\ \%$
(C) $+3.2\ \%$
(D) $-3.2\ \%$

Answer: (D) $-3.2\ \%$ · The council's preliminary key

Q127 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

When the area of cross section of a stretched wire is halved and tension is doubled, the speed of propagation of transverse waves along it becomes k times the initial speed. Then k =

(A) 1
(B) 4
(C) 2
(D) 8

Answer: (C) 2 · The council's preliminary key

Q128 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Two waves of frequency f and amplitude 'a' superimpose with each other. The total intensity is directly proportional to

(A) a
(B) $2a$
(C) $2a^2$
(D) $4a^2$

Options (3) or (4) were accepted. More than one answer was accepted. · The council's preliminary key

Q129 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

On getting reflected at a surface, the intensity of sound is found to be decreased by 20%. If 'A' be the amplitude of the incident sound waves, then the amplitude of reflected sound waves is

(A) $\frac{4}{5}A$
(B) $\frac{2}{\sqrt{5}}A$
(C) $\frac{\sqrt{2}}{5}A$
(D) $\frac{1}{\sqrt{5}}A$

Answer: (B) $\frac{2}{\sqrt{5}}A$ · The council's preliminary key

Q130 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

The distance between the successive node and antinode is _____

(A) λ
(B) $\frac{\lambda}{2}$
(C) $\frac{\lambda}{4}$
(D) $\frac{3\lambda}{4}$

Answer: (C) $\frac{\lambda}{4}$ · The council's preliminary key

Q131 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

A sound source is moving towards a stationary listener with $1/10^{th}$ of the speed of sound. The ratio of apparent to real frequency is _____

(A) $\frac{10}{9}$
(B) $\frac{11}{10}$
(C) $\left(\frac{11}{10}\right)^2$
(D) $\left(\frac{9}{10}\right)^2$

Answer: (A) $\frac{10}{9}$ · The council's preliminary key

Q132 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

On producing the waves of frequency $1000\ Hz$ in a Kundt's tube, the total distance between 6 successive nodes is $85\ cm$. Then, the speed of sound in the gas filled in the tube is

(A) $330\ m.s^{-1}$

(B) $340\ m.s^{-1}$

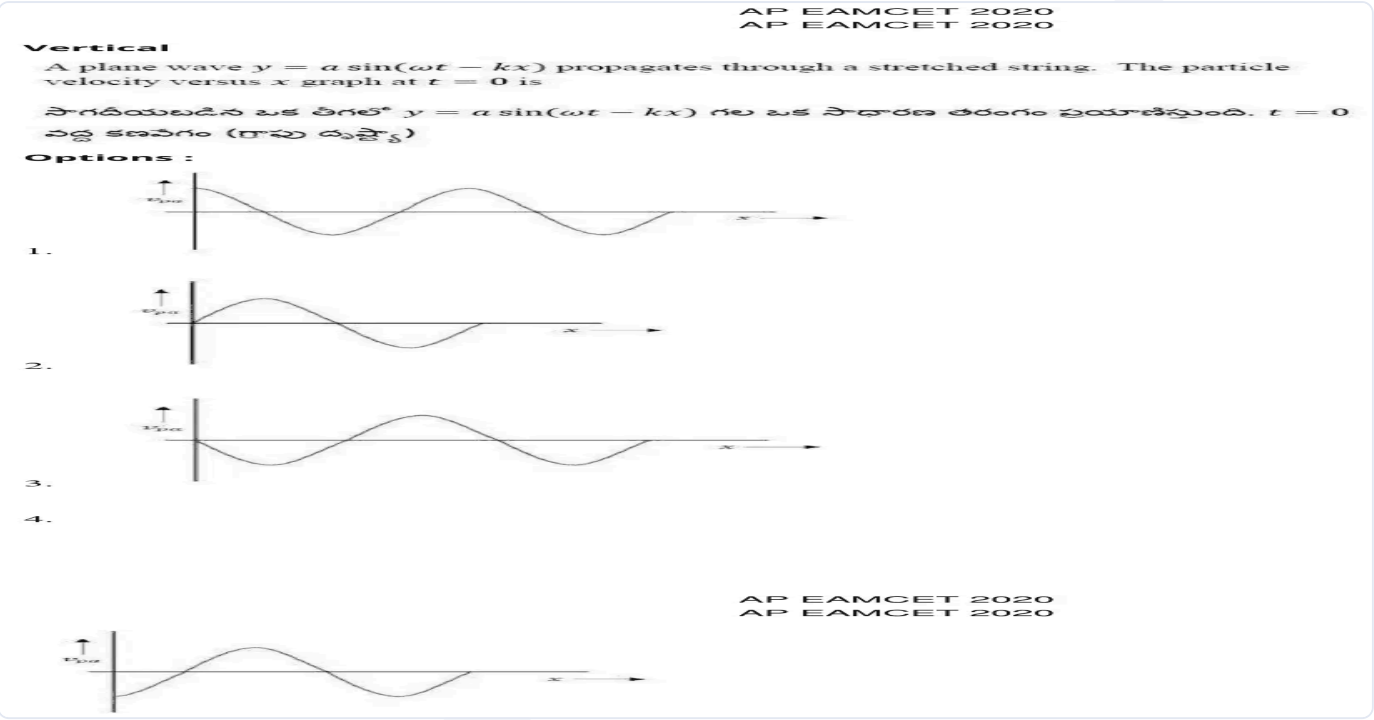
(C) $350\ m.s^{-1}$

(D) $300\ m.s^{-1}$

Answer: (B) $340\ m.s^{-1}$ · The council's preliminary key

Q133 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

A plane wave $y = a\sin(\omega t - kx)$ propagates through a stretched string. The particle velocity versus x graph at $t = 0$ is



(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

Answer: (A) · The council's preliminary key

Q134 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Two tuning forks X and Y are of frequencies 280 Hz and 284 Hz. A third tuning fork Z is of unknown frequency, when X and Z are sounded together certain beats are heard per second. When Y and Z are sounded together beat frequency is found to be thrice as great. The frequency of Z is

(A) 282 Hz
(B) 286 Hz
(C) 280 Hz
(D) 278 Hz

Answer: (D) 278 Hz · The council's preliminary key

Q135 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

What is the phase difference between two particles 25 m apart in a wave represented by equation $y = 0.03\ \sin(\pi\,[2t - 0.01\,x])$ travelling in a medium?

(A) $\pi/8$
(B) $\pi/4$
(C) $\pi/2$
(D) π

Answer: (B) $\pi/4$ · The council's preliminary key

Q136 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

An organ pipe with both ends open has a length L = 25 cm. An extra hole is created at position $\frac{L}{2}$.

The lowest frequency of sound produced is
(Assume speed of sound = 340 m/s)

(A) 680 Hz
(B) 340 Hz
(C) 1360 Hz
(D) 4352 Hz

Answer: (C) 1360 Hz · Official TGCHE final key

Q137 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

Two trucks heading in opposite directions each with speed $0.1\,u$, approach each other. The speed of the sound is u. The driver of first truck sounds his horn of frequency 495 Hz. Let ν_1 and ν_2 are the frequencies heard by the driver of second truck when the trucks approach each other and when the trucks have passed each other. The magnitude of $\nu_1 - \nu_2$ is

(A) 150 Hz
(B) 200 Hz
(C) 220 Hz
(D) 270 Hz

Answer: (B) 200 Hz · Official TGCHE final key

Q138 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

A bus moving with an uniform speed of 72 km/h towards a building blows a horn of frequency 1.7 KHz. If speed of sound in air is 340 m/s, what will be the frequency of echo heard by bus driver?

(A) 1.8 KHz
(B) 2.0 KHz
(C) 1.6 KHz
(D) 1.4 KHz

Answer: (B) 2.0 KHz · Checked by our team

Q139 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

The transverse displacement y(x,t) of a wave on a string is given by $y(x,t) = e^{-(ax^2+bt^2+2\sqrt{ab}\,xt)}$. This represents a

(A) Wave moving in negative x- direction with speed $\sqrt{\frac{b}{a}}$
(B) Standing wave of frequency $\sqrt{b}$
(C) Standing wave of frequency $\frac{1}{\sqrt{b}}$
(D) Wave moving in positive x- direction with speed $\sqrt{\frac{b}{a}}$

Answer: (A) Wave moving in negative x- direction with speed $\sqrt{\frac{b}{a}}$ · Official TGCHE final key

Q140 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

The phase difference between the following two waves y_2 and y_1 is:
$y_1 = a\sin(\omega t - kx)$
$y_2 = b\cos\left(\omega t - kx + \frac{\pi}{3}\right)$

(A) $\frac{\pi}{6}$
(B) $\frac{5\pi}{6}$
(C) $\frac{\pi}{3}$
(D) π

Answer: (B) $\frac{5\pi}{6}$ · Official TGCHE final key

Q141 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

An engine sounding a whistle of frequency 2000 Hz is receding from the stationary observer at 72 km/h. What is the apparent frequency of the observer? The velocity of sound in air is 340 m/s.

(A) 1889 Hz
(B) 2889 Hz
(C) 3889 Hz
(D) 4889 Hz

Answer: (A) 1889 Hz · Official TGCHE final key

Q142 TS EAMCET 2019 · 6 May · Shift 1 MCQ

Two identical sinusoidal waves moving in the same direction along a stretched string, interfere with each other. The phase difference between them is 120°. The amplitudes of both waves are same. If the amplitude of the resultant wave due to interference is 2 mm, the amplitude of each wave is

(A) 1 mm
(B) 2 mm
(C) $\sqrt{3}$ mm
(D) $2\sqrt{3}$ mm

Answer: (B) 2 mm · Official TGCHE final key

Q143 TS EAMCET 2019 · 6 May · Shift 1 MCQ

A whistle of frequency 660 Hz moves in a circle of radius 1 m at an angular speed of 10 rad/s. The highest frequency heard by a listener at a long distance and at rest with respect to the center of the circle is (Let speed of sound = 340 m/s)

(A) 700 Hz
(B) 640 Hz
(C) 720 Hz
(D) 680 Hz

Answer: (D) 680 Hz · Official TGCHE final key

Q144 TS EAMCET 2019 · 4 May · Shift 1 MCQ

Consider two tuning forks with natural frequency 250 Hz. One is moving away and another is moving towards a stationary observer at same speed. If the observer hears beats of frequency 5 Hz, then the speed of the tuning fork is (Given speed of sound wave is 350 m/s)

(A) $2.5\ \mathrm{m/s}$
(B) $3.5\ \mathrm{m/s}$
(C) $5.0\ \mathrm{m/s}$
(D) $2.0\ \mathrm{m/s}$

Answer: (B) $3.5\ \mathrm{m/s}$ · Official TGCHE final key

Q145 TS EAMCET 2019 · 4 May · Shift 1 MCQ

A drone fitted with siren is flying directly away from the drone operator and towards a distant building at a speed of 15 m/s. The siren produces sound of frequency 780 Hz. What is the frequency that the operator hears in the echo reflected from the building [Speed of sound is 340 m/s]

(A) 766 Hz
(B) 800 Hz
(C) 816 Hz
(D) 840 Hz

Answer: (C) 816 Hz · Official TGCHE final key

Q146 TS EAMCET 2019 · 4 May · Shift 2 MCQ

A string of length 100 cm has three resonant frequencies, 120 Hz, 200 Hz and 280 Hz. If a node is formed at the end of the string, the speed of the transverse wave on this string is

(A) 60 m/s
(B) 80 m/s
(C) 100 m/s
(D) 120 m/s

Answer: (B) 80 m/s · Official TGCHE final key

Q147 TS EAMCET 2019 · 3 May · Shift 1 MCQ

Standing waves are produced in a string 16 m long. If there are 9 nodes between the two fixed ends of the string and the speed of the wave is 32 m/s, what is the frequency of the wave?

(A) 5 Hz
(B) 10 Hz
(C) 30 Hz
(D) 20 Hz

Answer: (B) 10 Hz · Official TGCHE final key

Q148 TS EAMCET 2019 · 3 May · Shift 1 MCQ

A highway truck has two horns A and B. When sounded together, the driver records 50 beats in 10 seconds with horn B blowing and the truck moving towards a wall at a speed of 10 m/s, the driver noticed a beat frequency of 5 Hz with the echo. When frequency of A is decreased the beat frequency with two horns sounded together increases. Calculate the frequency of horn A. (Speed of sound = 330 m/s)

(A) 75 Hz
(B) 85 Hz
(C) 90 Hz
(D) 95 Hz

Answer: (A) 75 Hz · Official TGCHE final key

Q149 TS EAMCET 2019 · 3 May · Shift 2 MCQ

A musician on a moving vehicle plays a tone at 880 Hz note. When the vehicle was approaching a listner, he receives it as 888 Hz tone. The speed of the vehicle is (Assume the velocity of sound is 333 m/s)

(A) 6 m/s
(B) 5 m/s
(C) 3 m/s
(D) 1 m/s

Answer: (C) 3 m/s · Official TGCHE final key

Q150 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

Match the following List - I with List - II
A) Transverse wave
B) Longitudinal wave
C) Beats
D) Stationary waves
I) Vibrations parallel to the direction of propagation
II) Vibrations perpendicular to the direction of propagation
III) Superposition of waves travelling in opposite directions
IV) Superposition of waves travelling in same direction
The correct answer is

(A) A-II, B-I, C-III, D-IV
(B) A-II, B-I, C-IV, D-III
(C) A-III, B-IV, C-I, D-II
(D) A-IV, B-I, C-II, D-III

Answer: (B) A-II, B-I, C-IV, D-III · Official APSCHE final key

Q151 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

A police car moving at $22\ \mathrm{ms}^{-1}$ chases a motor cyclist. The police man sounds horn at $176\ \mathrm{Hz}$, while both of them move towards a stationary siren of frequency $165\ \mathrm{Hz}$. If the number of beats heard by the motor cyclist per second is zero, then the speed of motorcycle is
(speed of sound in air $= 330\ \mathrm{ms}^{-1}$)

(A) $33\ \mathrm{ms}^{-1}$
(B) $22\ \mathrm{ms}^{-1}$
(C) $44\ \mathrm{ms}^{-1}$
(D) $11\ \mathrm{ms}^{-1}$

Answer: (B) $22\ \mathrm{ms}^{-1}$ · Official APSCHE final key

Q152 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

When the air column of a resonance tube is vibrated together with a tuning fork, 3 beats are heard per second, either the temperature of the air column is $51\,^{\circ}\mathrm{C}$ or $16\,^{\circ}\mathrm{C}$. The frequency of the tuning fork is

(A) 128 Hz
(B) 98 Hz
(C) 105 Hz
(D) 256 Hz

Answer: (C) 105 Hz · Official APSCHE final key

Q153 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

Two sources A and B are producing notes of frequency 680 Hz. A listner moves from A to B with a constant velocity 'v'. If the speed of sound in air is $340\ \mathrm{ms}^{-1}$, the value of 'v' so that he hears 10 beats per second is

(A) $2.0\ \mathrm{ms}^{-1}$
(B) $2.5\ \mathrm{ms}^{-1}$
(C) $3.0\ \mathrm{ms}^{-1}$
(D) $3.5\ \mathrm{ms}^{-1}$

Answer: (B) $2.5\ \mathrm{ms}^{-1}$ · Official APSCHE final key

Q154 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

A metal wire of length $80\ \mathrm{cm}$, area of cross-section $3\ \mathrm{mm}^2$ and material density $3000\ \mathrm{kg\,m}^{-3}$ is joined to another metal wire of length $60\ \mathrm{cm}$, area of cross-section $1\ \mathrm{mm}^2$ and material density $9000\ \mathrm{kg\,m}^{-3}$. The free ends of the two wires are stretched between two rigid supports and a tension of $40\ \mathrm{N}$ is produced in the wires. The minimum frequency of the tuning fork which can produce stationary waves with the joint of the wires as a node is

(A) $\frac{200}{3}$ Hz
(B) $\frac{400}{3}$ Hz
(C) $\frac{500}{3}$ Hz
(D) $\frac{700}{3}$ Hz

Answer: (C) $\frac{500}{3}$ Hz · Official APSCHE final key

Q155 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

A source producing sound of frequency $720\ \text{Hz}$ is falling freely from the top of a tower of height $20\ \text{m}$. The frequency of sound heard by an observer on the top of the tower when the source just reaches the ground is (Acceleration due to gravity $= 10\ \text{ms}^{-2}$ and speed of sound in air $= 340\ \text{ms}^{-1}$)

(A) $660\ \text{Hz}$
(B) $680\ \text{Hz}$
(C) $740\ \text{Hz}$
(D) $760\ \text{Hz}$

Answer: (B) $680\ \text{Hz}$ · Official APSCHE final key

Q156 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

At a temperature of $27\,^{\circ}\text{C}$, two identical organ pipes produce notes of frequency 140 Hz. If the temperature of one pipe is raised to $57.75\,^{\circ}\text{C}$, the number of beats produced per second is

(A) 7
(B) 5
(C) 3
(D) 9

Answer: (A) 7 · Official APSCHE final key

Q157 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

A source of sound 'S' in the form of a block kept on a smooth horizontal surface is connected to a spring, as shown in the figure. If the spring oscillates with an amplitude of 50 cm along horizontal between the wall and the observer O, the maximum frequency heard by the observer is 12.5% more than the minimum frequency heard by him. If the mass of the source of sound is 100 g, the force constant of the spring is (Speed of sound in air is $340\ \text{ms}^{-1}$)

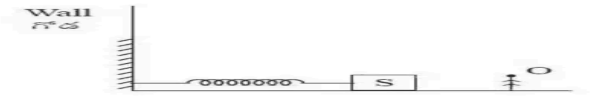
(see the figure above)

EdLoop EAPCET

Question Number : 101 Question Id : 1874634101 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A source of sound 'S' in the form of a block kept on a smooth horizontal surface is connected to a spring, as shown in the figure. If the spring oscillates with an amplitude of 50 cm along horizontal between the wall and the observer O, the maximum frequency heard by the observer is 12.5% more than the minimum frequency heard by him. If the mass of the source of sound is 100 g, the force constant of the spring is
(Speed of sound in air is 340 ms^{-1})

ఒక నునుపైన క్షితిజ సమాంతర తలంపైగల దిమ్మె ఆకారంలో ఉన్న ఒక శబ్ద జనకం 'S' ను పటంలో చూపిన విధంగా ఒక స్ప్రింగ్‌కు కలిపారు. స్ప్రింగ్ 50 cm కంపన పరిమితితో గోడకు మరియు పరిశీలకునకు (O) మధ్య క్షితిజ సమాంతరంగా డోలనాలు చేస్తున్నప్పుడు పరిశీలకుడు విన్న గరిష్ఠ పౌనఃపున్యం కనిష్ఠ పౌనఃపున్యం కంటే 12.5% ఎక్కువ. శబ్ద జనకం యొక్క ద్రవ్యరాశి 100 g అయితే, స్ప్రింగ్ యొక్క బల స్థిరాంకం
(గాలిలో ధ్వని వడి = 340 ms^{-1})



Options :
1. 40 N m^{-1}
2. 80 N m^{-1}
3. 160 N m^{-1}
4. 320 N m^{-1}

(A) $40\,\mathrm{N\,m^{-1}}$
(B) $80\,\mathrm{N\,m^{-1}}$
(C) $160\,\mathrm{N\,m^{-1}}$
(D) $320\,\mathrm{N\,m^{-1}}$

Answer: (C) $160\,\mathrm{N\,m^{-1}}$ · Official APSCHE final key

Q158 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

A cylindrical tube open at both ends has a fundamental frequency f in air. The tube is dipped vertically in water so that 60% of the tube is in water. Then the fundamental frequency of air column is

(A) $\frac{f}{2}$
(B) $\frac{5f}{4}$
(C) $\frac{3f}{4}$
(D) $2f$

Answer: (B) $\frac{5f}{4}$ · Official APSCHE final key

Q159 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

A train approaching a railway crossing at a speed of 120 kmph sounds a whistle of frequency 576 Hz, when it is 288 m away from the crossing. The frequency heard by the observer standing on the road perpendicular to the track from the crossing at a distance of 384 m is
(Speed of sound in air $= 340\ \mathrm{ms^{-1}}$)

(A) 632 Hz
(B) 612 Hz
(C) 512 Hz
(D) 472 Hz

Answer: (B) 612 Hz · Official APSCHE final key

Q160 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

An earthquake generates both transverse (S) and longitudinal (P) waves in the earth with speeds $4.5\ \mathrm{km\,s^{-1}}$ and $8.0\ \mathrm{km\,s^{-1}}$ respectively. A seismograph records that the first P-wave arrives 3.5 minutes earlier than the first S-wave. From the seismograph, the epicentre of the earthquake is located at a distance

(A) 1080 km
(B) 2468 km
(C) 2160 km
(D) 4320 km

Answer: (C) 2160 km · Official APSCHE final key

Q161 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

An observer moves towards a stationary source of sound with a speed $\frac{1}{5}^{\text{th}}$ of the speed of sound. The wavelength and frequency of the waves emitted by the source are 'λ' and 'f' respectively. The apparent frequency and wavelength heard by the observer are respectively

(A) $1.2f,\ \lambda$
(B) $f,\ 1.2\lambda$
(C) $0.8f,\ 0.8\lambda$
(D) $1.2f,\ 1.2\lambda$

Answer: (A) $1.2f,\ \lambda$ · Official APSCHE final key

Q162 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

A siren placed at a railway platform is emitting a sound of frequency 5 kHz. A passenger sitting in a moving train 'A' records the frequency of the siren as 5.5 kHz. During his return journey by train 'B' he records the frequency of the siren as 6 kHz. The ratio of the speed of train B to that of train A is

(A) $\frac{242}{252}$
(B) 2
(C) $\frac{5}{6}$
(D) $\frac{11}{6}$

Answer: (B) 2 · Official APSCHE final key

Q163 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

The speed of a transverse wave travelling in a wire of length 50 cm, cross-sectional area $1\ \mathrm{mm}^2$ and mass 5 g is $80\ \mathrm{ms}^{-1}$. The Young's modulus of the material of the wire is $4 \times 10^{11}\ \mathrm{Nm}^{-2}$. The extension in the length of the wire is

(A) $8 \times 10^{-5}\ \mathrm{m}$
(B) $8 \times 10^{-4}\ \mathrm{m}$
(C) $16 \times 10^{-5}\ \mathrm{m}$
(D) $16 \times 10^{-4}\ \mathrm{m}$

Answer: (A) $8 \times 10^{-5}\ \mathrm{m}$ · Official APSCHE final key

Q164 TS EAMCET 2018 · 7 May · Shift 1 MCQ

The speed of sound in air at temperature T and pressure P is v. When the temperature is increased to $2T$ and the pressure is reduced to $P/2$, then the speed is changed to _____

(A) 2v
(B) v
(C) $\sqrt{2}$v
(D) $\frac{\mathrm{v}}{\sqrt{2}}$

Answer: (C) $\sqrt{2}$v · The council's preliminary key

Q165 TS EAMCET 2018 · 5 May · Shift 1 MCQ

A wire of length 50 cm and weighing 10 gm is attached to a spring at one end and to a fixed wall at the other end. The spring has a spring constant of 50 N/m and is stretched by 1 cm. If a wave pulse is produced on the string near the wall, how much time will it take to reach the spring

(A) 0.1 s
(B) 0.2 s
(C) 0.3 s
(D) 0.4 s

Answer: (A) 0.1 s · The council's preliminary key

Q166 TS EAMCET 2018 · 5 May · Shift 2 MCQ

The speed of a transverse wave on a string is $160\ \mathrm{m/sec}$. If the three resonant frequencies of this string respectively are $160\ \mathrm{Hz}$, $240\ \mathrm{Hz}$ and $400\ \mathrm{Hz}$, the length of the string is

(A) $80\ \text{cm}$
(B) $100\ \text{cm}$
(C) $160\ \text{cm}$
(D) $200\ \text{cm}$

Answer: (B) $100\ \text{cm}$ · The council's preliminary key

Q167 TS EAMCET 2018 · 4 May · Shift 1 MCQ

Two harmonic travelling waves are described by the equations $y_1 = a\sin(kx - \omega t)$ and $y_2 = a\sin(-kx + \omega t + \phi)$. The amplitude of the superposed wave is

(A) $2a\cos\frac{\phi}{2}$
(B) $2a\sin\phi$
(C) $2a\cos\phi$
(D) $2a\sin\frac{\phi}{2}$

Answer: (D) $2a\sin\frac{\phi}{2}$ · The council's preliminary key

---

Q168 TS EAMCET 2018 · 4 May · Shift 2 MCQ

A source of sound whose frequency is 1000 Hz is moving with a speed 33 m/s. The waves reflected by a fixed obstacle are registered by a receiver that moves together with the source. (the speed of the sound waves is 330 m/s). The frequency registered by the receiver is

(A) 0.9 kHz
(B) 1.1 kHz
(C) 1.2 kHz
(D) 2.2 kHz

Answer: (C) 1.2 kHz · The council's preliminary key

Q169 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

Two uniform stretched steel strings A and B are vibrating under the same tension. The first overtone of A is equal to the second overtone of B. If the radius of A is twice that of B, then the ratio of the lengths of the strings is _____

(A) $2:3$
(B) $1:2$
(C) $1:3$
(D) $1:4$

Answer: (C) $1:3$ · The council's preliminary key

Q170 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

A open pipe of length 'l' is vibrating in 3rd overtone with maximum amplitude 'A'. The amplitude at a distance of $\frac{l}{16}$ from any open end is

(A) A
(B) 0
(C) $\frac{A}{\sqrt{2}}$
(D) $\frac{\sqrt{3}A}{2}$

Answer: (C) $\frac{A}{\sqrt{2}}$ · The council's preliminary key

Q171 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

A motor cycle starts from rest from a stationary source of sound and moves away from the source with a uniform acceleration $2\ \text{ms}^{-2}$. Distance travelled by the motor cycle when the person on it hears the sound of frequency which is 94% of the true frequency, is nearly
(speed of sound in air $= 330\ \text{ms}^{-1}$)

(A) $49\ \text{m}$
(B) $98\ \text{m}$
(C) $147\ \text{m}$
(D) $196\ \text{m}$

Answer: (B) $98\ \text{m}$ · The council's preliminary key

Q172 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

A steel wire of length $1\ \text{m}$, mass $0.1\ \text{kg}$ and uniform area of cross section $10^{-6}\ \text{m}^2$ is rigidly fixed at both the ends without any tension. Its temperature is lowered by $20\ ^\circ\text{C}$ and transverse waves are set up by plucking the wire at the middle. The frequency of the fundamental mode is
($Y = 200\ \text{GPa}$, $\alpha = 1.21 \times 10^{-5}\ ^\circ\text{C}^{-1}$)

(A) $21\ \text{Hz}$
(B) $42\ \text{Hz}$
(C) $11\ \text{Hz}$
(D) $22\ \text{Hz}$

Answer: (C) $11\ \text{Hz}$ · The council's preliminary key

Q173 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If the length of a stretched string is shortened by $x\ \%$ and the tension is increased by 44%, then the ratio of the final and initial fundamental frequencies is 1:2, the value of 'x' is

(A) 20
(B) 30
(C) 40
(D) 60

Answer: (C) 40 · The council's preliminary key

Q174 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

A small source of sound vibrating at a frequency 500 Hz is rotated along a circle of radius $\frac{100}{\pi}$ cm at a constant angular speed of 5 revolutions per second. The minimum and maximum frequency of the sound observed by a listener situated in the plane of the circle is
(Speed of sound is $332\ \mathrm{ms}^{-1}$)

(A) 338.5 Hz, 612.5 Hz
(B) 485.4 Hz, 535.6 Hz
(C) 435.3 Hz, 565.6 Hz
(D) 485.4 Hz, 515.5 Hz

Answer: (D) 485.4 Hz, 515.5 Hz · The council's preliminary key

Q175 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

A progressive wave of frequency 500 Hz is travelling with a velocity of $360\ \mathrm{ms}^{-1}$. The distance between the two points, having a phase difference of 60°, is _____

(A) 1.2 m
(B) 12 m
(C) 0.12 m
(D) 0.012 m

Answer: (C) 0.12 m · The council's preliminary key

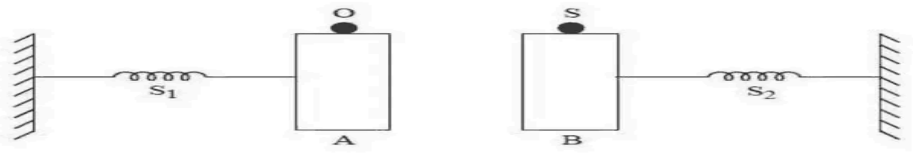
Q176 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

A source S emitting sound of frequency 288 Hz is fixed on block B which is attached to the free end of a spring S_2 and an observer O is on block A which is attached to the free end of spring S_1; as shown in the figure. The blocks A and B are simultaneously displaced towards each other through a distance of 0.5 m and then left to oscillate. If the angular velocity of each block is $40\ \mathrm{rad\ s}^{-1}$, the maximum frequency observed by the observer is
(speed of sound in air is $340\ \mathrm{ms}^{-1}$) *(see the figure above)*

Question Number : 101 Question Id : 4557344261 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A source S emitting sound of frequency 288 Hz is fixed on block B which is attached to the free end of a spring S_2 and an observer O is on block A which is attached to the free end of spring S_1; as shown in the figure. The blocks A and B are simultaneously displaced towards each other through a distance of 0.5 m and then left to oscillate. If the angular velocity of each block is 40 rad s^{-1}, the maximum frequency observed by the observer is
(speed of sound in air is 340 ms^{-1})

288 Hz పౌనఃపున్యంగల శబ్దమును విడుదల చేయుచున్న ఒక జనకము S ను ఒక స్ప్రింగ్ S_2 యొక్క స్వేచ్ఛా చివరకు కట్టబడిన దిమ్మె B కు బిగించారు. పటంలో చూపిన విధంగా ఒక పరిశీలకుడు, ఒక స్ప్రింగ్ S_1 యొక్క స్వేచ్ఛా చివరకు కట్టబడిన దిమ్మె A పై కలడు. A మరియు B దిమ్మెలను ఒకేసారి ఒకదాని వైపు ఒకటిని 0.5 m దూరం కదల్చి డోలనం చేసే విధంగా వదిలారు. ఒక్కొక్క దిమ్మె యొక్క కోణీయ వేగం 40 rad s^{-1} అయితే, పరిశీలకుడు పరిశీలించిన గరిష్ఠ పౌనఃపున్యం=
(గాలిలో ధ్వని వడి = 340 ms^{-1})



Options :
1. 288 Hz
2. 310 Hz
3. 324 Hz
4. 256 Hz

(A) 288 Hz
(B) 310 Hz
(C) 324 Hz
(D) 256 Hz

Answer: (C) 324 Hz · The council's preliminary key

Q177 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

A solid ball is suspended from the ceiling of a motor car through a light string. A transverse pulse travels at the speed $60\ \text{cms}^{-1}$ on the string when the car is at rest. When the car accelerates on a horizontal road, speed of the pulse is $66\ \text{cms}^{-1}$. The acceleration of the car is nearly ($g = 10\ \text{ms}^{-2}$)

(A) $4.3\ \text{ms}^{-2}$
(B) $2.9\ \text{ms}^{-2}$
(C) $6.8\ \text{ms}^{-2}$
(D) $5.5\ \text{ms}^{-2}$

Answer: (C) $6.8\ \text{ms}^{-2}$ · The council's preliminary key

Q178 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

A reflector is moving with $20\ \text{ms}^{-1}$ towards a stationary source of sound. If the source is producing sound waves of $160\ \text{Hz}$ then the wavelength of the reflected wave is
(speed of sound in air is $340\ \text{ms}^{-1}$)

(A) $\frac{17}{8}$ m
(B) $\frac{17}{11}$ m
(C) $\frac{17}{9}$ m
(D) $\frac{17}{16}$ m

Answer: (C) $\frac{17}{9}$ m · The council's preliminary key

Q179 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

An object of density $2000\ \mathrm{kgm^{-3}}$ is hung from a thin light wire. The fundamental frequency of the transverse waves in the wire is 200 Hz. If the object is immersed in water such that half of its volume is submerged, then the fundamental frequency of the transverse waves in the wire is _____

(A) 200.0 Hz
(B) 173.2 Hz
(C) 100.0 Hz
(D) 141.4 Hz

Answer: (B) 173.2 Hz · The council's preliminary key

Q180 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

An observer and a source emitting sound of frequency 120 Hz are on the X-axis. The observer is stationary while the source of sound is in motion given by the equation $x = 3\sin\omega t$ (x in metres and t in seconds). If the difference between the maximum and minimum frequencies of the sound observed by the observer is 22 Hz, then the value of ω is (Speed of sound in air $= 330\ \mathrm{ms^{-1}}$)

(A) $33\ \mathrm{rad\,s^{-1}}$
(B) $36\ \mathrm{rad\,s^{-1}}$
(C) $20\ \mathrm{rad\,s^{-1}}$
(D) $10\ \mathrm{rad\,s^{-1}}$

Answer: (D) $10\ \mathrm{rad\,s^{-1}}$ · The council's preliminary key

Q181 TS EAMCET 2017 · 12 May · Offline MCQ

Which of the following principles is being used in Sonar Technology?

(A) Newton's laws of motion
(B) Reflection of electromagnetic waves
(C) Laws of thermodynamics
(D) Reflection of ultrasonic waves

Answer: (D) Reflection of ultrasonic waves · The council's preliminary key

Q182 TS EAMCET 2017 · 12 May · Offline MCQ

A sound wave of frequency 'ν' Hz initially travels a distance of $1\ \mathrm{km}$ in air. Then it gets reflected into a water reservoir of depth $600\ \mathrm{m}$. The frequency of the wave at the bottom of the reservoir is ($V_{\text{air}} = 340\ \mathrm{m/s}$; $V_{\text{water}} = 1484\ \mathrm{m/s}$)

(A) $> \nu$ Hz

(B) $< \nu$ Hz

(C) ν Hz

(D) 0 (the sound wave gets attenuated by water completely)

Answer: (C) ν Hz · The council's preliminary key

Q183 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

The transverse displacement of a string of a linear density $0.01\ \mathrm{kg\,m^{-1}}$, clamped at its ends is given by $Y_{(x,t)} = 0.03 \sin\left(\frac{2\pi x}{3}\right) \cos(60\pi t)$ where x and y are in metres and time 't' in seconds. Tension in the string is

(A) $81\ \mathrm{N}$

(B) $162\ \mathrm{N}$

(C) $36\ \mathrm{N}$

(D) $9\ \mathrm{N}$

Answer: (A) $81\ \mathrm{N}$ · The council's preliminary key

Q184 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

A closed organ pipe of length 'L' and an open organ pipe contain gases of densities ρ_1 and ρ_2 respectively. The compressibility of gases are equal in both the pipes. If the frequencies of their first overtones are same, then the length of the open organ pipe is

(A) $\frac{L}{3}$

(B) $\frac{4L}{3}$

(C) $\frac{4L}{3}\sqrt{\frac{\rho_1}{\rho_2}}$

(D) $\frac{4L}{3}\sqrt{\frac{\rho_2}{\rho_1}}$

Answer: (C) $\frac{4L}{3}\sqrt{\frac{\rho_1}{\rho_2}}$ · The council's preliminary key

Q185 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

When a train is approaching the stationary observer, the apparent frequency of the whistle of the train is n_1 and when the train is moving away from the observer, the apparent frequency is n_2. The frequency of the whistle noticed by the observer when he moves with the train is _____

EdLoop EAPCET

(A) $\frac{2n_1n_2}{n_1+n_2}$
(B) $\frac{n_1n_2}{n_1+n_2}$
(C) $\frac{2n_1n_2}{n_1-n_2}$
(D) $\frac{n_1n_2}{n_1-n_2}$

Answer: (A) $\frac{2n_1n_2}{n_1+n_2}$ · The council's preliminary key

Q186 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

The depth of the sea measured by means of an echo. If the time between the moment of the sound produced and received is 3.52 s, then the depth of the sea is
(The compressibility of sea water is $4.84 \times 10^{-10}\ \mathrm{m^2N^{-1}}$ and its density is $1024\ \mathrm{kg\,m^{-3}}$) is

(A) $1.5\ \mathrm{km}$
(B) $1.9\ \mathrm{km}$
(C) $2.5\ \mathrm{km}$
(D) $2.9\ \mathrm{km}$

Answer: (C) $2.5\ \mathrm{km}$ · The council's preliminary key

Q187 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

A transverse wave is described by the equation $y = y_0 \sin 2\pi\left(vt - \frac{x}{\lambda}\right)$. The maximum particle velocity is equal to four times the wave velocity if $\lambda =$

(A) $\lambda = \frac{\pi y_0}{4}$
(B) $\lambda = \frac{\pi y_0}{2}$
(C) $\lambda = 2\pi y_0$
(D) $\lambda = \frac{\pi}{y_0}$

Answer: (B) $\lambda = \frac{\pi y_0}{2}$ · The council's preliminary key

Q188 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

A bus is moving with a velocity of 5 $\mathrm{ms^{-1}}$ towards a huge wall. The driver sounds horn of frequency 165 Hz. If the speed of sound in air is 335 $\mathrm{ms^{-1}}$, the number of beats heard per second by the passengers in the bus will be

(A) 6
(B) 4
(C) 3
(D) 5

Answer: (D) 5 · The council's preliminary key

Q189 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

An open pipe and a closed pipe have fundamental frequencies n_1 and n_2 respectively. They are combined to form a closed pipe. Fundamental frequency of the combined pipe is

(A) $n_1 + n_2$
(B) $n_1 - n_2$
(C) $\frac{n_1 n_2}{n_1 - 2n_2}$
(D) $\frac{n_1 n_2}{n_1 + 2n_2}$

Answer: (D) $\frac{n_1 n_2}{n_1 + 2n_2}$ · The council's preliminary key

Q190 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

A source emitting sound of frequency 288 Hz is tied to a string of 100 cm length and rotated with an angular velocity of $20\ \mathrm{rad\,s^{-1}}$ in the horizontal plane. The range of frequencies heard by an observer standing at a distance of 5 m from the source is (in Hz)
(Speed of sound in air $= 340\ \mathrm{ms^{-1}}$)

(A) 275 to 320
(B) 272 to 306
(C) 288 to 340
(D) 278 to 298

Answer: (B) 272 to 306 · The council's preliminary key

Q191 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

56 tuning forks are arranged such that each fork produces 4 beats per second with its previous one. If the frequency of the last fork is twice that of the first, the frequency of 19th fork is _____

(A) 292 Hz
(B) 302 Hz
(C) 272 Hz
(D) 312 Hz

Answer: (A) 292 Hz · The council's preliminary key

Q192 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

A closed pipe is in resonance with a tuning fork at $27\ ^{\circ}\mathrm{C}$ when its length is 20 cm. If the pipe is to be in resonance with the same tuning fork at $7\ ^{\circ}\mathrm{C}$ then the change in the length of the pipe required is nearly

(A) 1 mm
(B) 7 mm
(C) 5 mm
(D) 13 mm

Answer: (B) 7 mm · The council's preliminary key

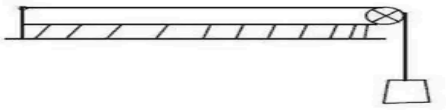
Q193 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

As shown in the figure, a block of mass 9 kg is hung by a wire of area of cross-section of $1\ \mathrm{mm}^2$ in a lift going up with an acceleration of $2\ \mathrm{ms}^{-2}$. If the speed of the transverse wave on the wire is $120\ \mathrm{ms}^{-1}$, the density of the material of the wire is (Acceleration due to gravity $= 10\ \mathrm{ms}^{-2}$)
(see the figure above)

Question Number : 100 Question Id : 1017173940 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

As shown in the figure, a block of mass 9 kg is hung by a wire of area of cross-section of 1 mm^2 in a lift going up with an acceleration of 2 ms^{-2}. If the speed of the transverse wave on the wire is 120 ms^{-1}, the density of the material of the wire is (Acceleration due to gravity = 10 ms^{-2})

2 ms^{-2} త్వరణంతో పైకి కదులుచున్న ఒక లిఫ్టులో 1 mm^2 ముధ్యచ్ఛేద వైశాల్యం గల తీగనుపయోగించి 9 kg ద్రవ్యరాశి గల ఒక దిమ్మెను పటంలో చూపిన విధంగా వ్రేలాడదీశారు. తీగలోని తిర్యక్ తరంగ వడి 120 ms^{-1} అయితే తీగ పదార్థపు సాంద్రత (గురుత్వ త్వరణం = 10 ms^{-2})



Options :
1. $1.5\ \mathrm{g\ cm^{-3}}$
2. $3.5\ \mathrm{g\ cm^{-3}}$
3. $5.5\ \mathrm{g\ cm^{-3}}$
4. $7.5\ \mathrm{g\ cm^{-3}}$

(A) $1.5\ \mathrm{g\ cm^{-3}}$
(B) $3.5\ \mathrm{g\ cm^{-3}}$
(C) $5.5\ \mathrm{g\ cm^{-3}}$
(D) $7.5\ \mathrm{g\ cm^{-3}}$

Answer: (D) $7.5\ \mathrm{g\ cm^{-3}}$ · The council's preliminary key

Q194 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

A stationary source of sound A is producing sound of frequency 170 Hz. Another source of sound B producing sound of frequency 240 Hz is moving towards the source A on a straight path with a uniform speed of $20\ \mathrm{ms}^{-1}$. An observer between A and B is moving towards the source A along the straight path BA. If the number of beats heard by the observer is zero, the speed of the observer is _____ ms^{-1}. (Speed of sound in air $= 340\ \mathrm{ms}^{-1}$)

(A) 40
(B) 34
(C) 68
(D) 30

Answer: (C) 68 · The council's preliminary key

Q195 TS EAMCET 2016 · 15 May · Offline MCQ

A source of frequency 340 Hz is kept above a vertical cylindrical tube closed at lower end. The length of the tube is 120 cm. Water is slowly poured in just enough to produce resonance. Then the minimum height (velocity of sound = 340 m/s) of the water level in the tube for that resonance is,

(A) 0.75 m
(B) 0.25 m
(C) 0.95 m
(D) 0.45 m

Answer: (D) 0.45 m · Official TGCHE final key

Q196 AP EAMCET 2016 · 29 Apr · Offline MCQ

For a certain organ pipe, three successive resonance frequencies are observed at 425, 595 and 765 Hz, respectively. The length of the pipe is (speed of sound in air = $340\ \mathrm{ms}^{-1}$)

(A) 0.5 m
(B) 1 m
(C) 1.5 m
(D) 2 m

Answer: (B) 1 m · The council's preliminary key

Q197 AP EAMCET 2016 · 29 Apr · Offline MCQ

A student holds a tuning fork oscillating at 170 Hz. He walks towards a wall at a constant speed of $2\ \mathrm{ms}^{-1}$. The beat frequency observed by the student between the tuning fork and its echo is (Velocity of sound = $342\ \mathrm{ms}^{-1}$)

EdLoop EAPCET

(A) 2.5 Hz
(B) 3 Hz
(C) 1 Hz
(D) 2 Hz

Answer: (D) 2 Hz · The council's preliminary key

Q198 AP EAMCET 2014 · 22 May · Offline MCQ

A closed pipe is suddenly opened and changed to an open pipe of same length. The fundamental frequency of the resulting open pipe is less than that of 3rd harmonic of the earlier closed pipe by 55 Hz. Then, the value of fundamental frequency of the closed pipe is

(A) 165 Hz
(B) 110 Hz
(C) 55 Hz
(D) 220 Hz

Answer: (C) 55 Hz · The council's preliminary key

Q199 AP EAMCET 2013 · 10 May · Offline MCQ

An air column in a tube 32 cm long, closed at one end, is in resonance with a tuning fork. The air column in another tube, open at both ends, of length 66 cm is in resonance with another tuning fork. When these two tuning forks are sounded together, they produce 8 beats per second. Then the frequencies of the two tuning forks are, (Consider fundamental frequencies only)

(A) 250 Hz, 258 Hz
(B) 240 Hz, 248 Hz
(C) 264 Hz, 256 Hz
(D) 280 Hz, 272 Hz

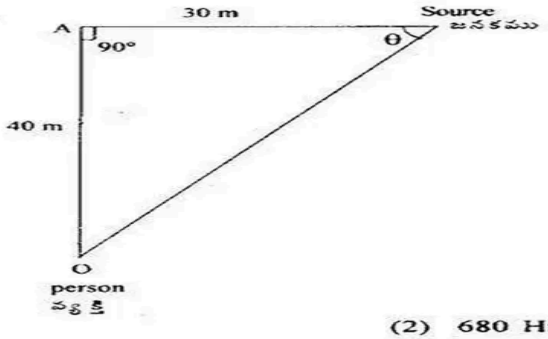
Answer: (C) 264 Hz, 256 Hz · The council's preliminary key

Q200 AP EAMCET 2013 · 10 May · Offline MCQ

A source of sound of frequency 640 Hz is moving at a velocity of $\frac{100}{3}$ m/s along a road, and is at an instant 30 m away from a point A on the road (as shown in figure). A person standing at O, 40 m away from the road hears sound of apparent frequency ν^1. The value of ν^1 is (velocity of sound = 340 m/s) *(see the figure above)*

102. A source of sound of frequency 640 Hz is moving at a velocity of $\frac{100}{3}$ m/s along a road, and is at an instant 30 m away from a point A on the road (as shown in figure). A person standing at O, 40 m away from the road hears sound of apparent frequency v^1. The value of v^1 is (velocity of sound = 340 m/s)

640 Hz పౌనఃపున్యము గల ఒక ధ్వని జనకం ఒక రోడ్డు వెంబడి $\frac{100}{3}$ m/s వేగముతో కదలుచున్నది. ఆ ధ్వని జనకం ఒక రోడ్డుపైనున్న A అను బిందువు నుండి 30 m ల దూరంలో ఉన్నది (పటంలో చూపబడినట్లు). రోడ్డు నుండి 40 m దూరంలో O వద్ద నుంచున్న వ్యక్తి v^1 దృశ్యా పౌనఃపున్యంతో ఆ ధ్వనిని విన్నాడు. v^1 యొక్క విలువ (ధ్వని వేగం = 340 m/s)



(1) 620 Hz
(2) 680 Hz
(3) 720 Hz
(4) 840 Hz

(A) 620 Hz
(B) 680 Hz
(C) 720 Hz
(D) 840 Hz

Answer: (B) 680 Hz · The council's preliminary key

Q201 AP EAMCET 2012 · 12 May · Offline MCQ

A uniform rope of mass 0.1 kg and length 2.45 m hangs from a rigid support. The time taken by the transverse wave formed in the rope to travel through the full length of the rope is (Assume g = 9.8 m/s^2)

(A) 0.5 s
(B) 1.6 s
(C) 1.2 s
(D) 1.0 s

Answer: (D) 1.0 s · Official APSCHE final key

Q202 AP EAMCET 2012 · 12 May · Offline MCQ

When a vibrating tuning fork is placed on a sound box of a sonometer, 8 beats per second are heard when the length of the sonometer wire is kept at 101 cm or 100 cm. Then the frequency of the tuning fork is (consider that the tension in the wire is kept constant)

(A) 1616 Hz
(B) 1608 Hz
(C) 1632 Hz
(D) 1600 Hz

Answer: (B) 1608 Hz · Official APSCHE final key

Q203 AP EAMCET 2011 · 8 May · Offline MCQ

The wavelengths of two sound notes in air are $\frac{40}{195}$ m and $\frac{40}{193}$ m. Each note produces 9 beats per second separately with a third note of fixed frequency. The velocity of sound in air in m/s is :

(A) 360
(B) 320
(C) 300
(D) 340

Answer: (A) 360 · The council's preliminary key

Q204 AP EAMCET 2011 · 8 May · Offline MCQ

Two uniform stretched strings A and B, made of steel, are vibrating under the same tension. If the first overtone of A is equal to the second overtone of B and if the radius of A is twice that of B, the ratio of the lengths of the strings is :

(A) $2:3$
(B) $1:2$
(C) $1:3$
(D) $1:4$

Answer: (C) $1:3$ · The council's preliminary key

Q205 AP EAMCET 2010 · 30 May · Offline MCQ

An organ pipe P_1, closed at one end and containing a gas of density ρ_1 is vibrating in its first harmonic. Another organ pipe P_2, open at both ends and containing a gas of density ρ_2 is vibrating in its third harmonic. Both the pipes are in resonance with a given tuning fork. If the compressibility of gases is equal in both pipes, the ratio of the lengths of P_1 and P_2 is (assume the given gases to be mono-atomic) :

EdLoop EAPCET

(A) $1/3$

(B) 3

(C) $\frac{1}{6}\sqrt{\frac{\rho_1}{\rho_2}}$

(D) $\frac{1}{6}\sqrt{\frac{\rho_2}{\rho_1}}$

Answer: (D) $\frac{1}{6}\sqrt{\frac{\rho_2}{\rho_1}}$ · Official APSCHE final key

---

Q206

AP EAMCET 2010 · 30 May · Offline | MCQ

A sonometer wire has a length of 114 cm, between two fixed ends. Where should two bridges be placed so as to divide the wire into three segments (in cm) whose fundamental frequencies are in the ratio $1:3:4$?

(A) $l_1, l_2, l_3 = 18, 24, 72$

(B) $l_1, l_2, l_3 = 24, 18, 72$

(C) $l_1, l_2, l_3 = 72, 18, 24$

(D) $l_1, l_2, l_3 = 72, 24, 18$

Answer: (D) $l_1, l_2, l_3 = 72, 24, 18$ · Official APSCHE final key

EdLoop EAPCET