



## TEST

### Practice Test -1 ( Topic-6 Waves )



10 Questions



10 min

#### Topics

Progressive wave, Transverse and longitudinal waves, Principle of superposition, Stationary waves, Stationary waves in a stretched string

[Start Test](#)

09 : 59



1/10



10 min



Hint

Q : When a wave goes from one medium to another medium, which one of the following characteristics of the wave remains constant?



Velocity



Frequency



Wavelength



Phase

1

2

3

4

5

6

7

09 : 57



2/10



10 min



Hint

Q : The resultant displacement of super position of two waves of amplitudes  $y_1$  and  $y_2$  same frequency which are exactly in phase is:



0



$y_1 + y_2$



$y_1 - y_2$



$y_2 - y_1$

1

2

3

4

5

6

7

09 : 56



3/10



10 min



Hint

Q : If the tension in the string is doubled and it's mass per unit length is reduced to half. Then the speed of transverse wave on it is:



Doubled



Halved



Constant



One fourth

1

2

3

4

5

6

7

09 : 55



4/10



10 min



Hint

Q : No energy is transmitted in a



transverse progressive waves



stationary waves



longitudinal progressive waves



none of these

1

2

3

4

5

6

7

09 : 54



5/10



10 min



Hint

Q : When the string vibrates in three loops then the length ' $l$ ' of the string is expressed as

A  $l = \frac{3\lambda}{4}$

B  $l = \frac{\lambda}{2}$

C  $l = \frac{3\lambda}{2}$

D  $l = \frac{2\lambda}{3}$

1

2

3

4

5

6

7

09 : 53



6/10



10 min



Hint

Q : Which of the following is the longitudinal wave?



Sound waves



Water waves



Waves on plucked string



Light waves

1

2

3

4

5

6

7

09 : 51



7/10



10 min



Hint

Q : 10 waves pass through the medium in one second with speed of 10 m/s. The wavelength of waves is:



1m



10m



20m



100m

4

5

6

7

8

9

10

09 : 50



8/10



10 min



Hint

Q : Two waves are propagating with the same amplitude and same frequency in opposite direction, they result in



Beats



Stationary wave



Resonance



Wave packet

4

5

6

7

8

9

10

09 : 48



9/10



10 min



Hint

Q : The speed of a wave in a medium is 760 m/s. If 3600 waves are passing through a point, in the medium in 2 minutes, then its wavelength is



13.8 m



25.3 m



41.5 m



57.2 m

4

5

6

7

8

9

10

09 : 47



10/10



10 min



Hint

Q : The distance between the consecutive node and antinode in a stationary wave is



$\lambda$



$\lambda/2$



$\lambda/4$



$2\lambda$

4

5

6

7

8

9

10



TEST

## Practice Test -2 ( Topic-6 Waves )



10 Questions



10 min

### Topics

Stationary waves in open organ pipe,  
Stationary waves in closed organ pipe,  
Doppler effect, Applications of Doppler  
effect

[Start Test](#)

09 : 59



1/10



10 min



Hint

Q : When source of sound moves away from a stationary listener, then frequency of sound:

A

Decreases

B

Increases

C

Remain constant

D

Become zero

1

2

3

4

5

6

7

09 : 57



2/10



10 min



Hint

Q : An observer is moving towards

stationary source with velocity  $\frac{v}{3}$ . The apparent frequency would be if  $v$  is the speed of sound and  $f$  is the original frequency



$$\left(\frac{4}{3}\right) f$$



$$\left(\frac{2}{3}\right) f$$



$$\left(\frac{3}{4}\right) f$$



$$\left(\frac{3}{2}\right) f$$

1

2

3

4

5

6

7

09 : 55



2/10



10 min



Hint

Q : An observer is moving towards

stationary source with velocity  $\frac{v}{3}$ . The apparent frequency would be if  $v$  is the speed of sound and  $f$  is the original frequency

A  $(\frac{4}{3})f$

B  $(\frac{2}{3})f$

C  $(\frac{3}{4})f$

D  $(\frac{3}{2})f$

1

2

3

4

5

6

7

09 : 54



3/10



10 min



Hint

Q : The sonar is a technique for detecting the presence of objects under water by



ultra sonic



infrasonic



frequency



acoustical echo

1

2

3

4

5

6

7

09 : 53



4/10



10 min



Hint

Q : An air column in a pipe, which is closed at one end, will be in resonance with a vibrating body of frequency 166 Hz, if the length of the air column is. (speed of sound =  $332\text{ms}^{-1}$ )

A 2.00 m

B 1.50 m

C 1.00 m

D 0.50 m

1

2

3

4

5

6

7

09 : 52



5/10



10 min



Hint

Q : The speed of sound in air is 350 meter per second. The fundamental frequency of an open pipe 50 cm long will be:

A 175 Hz

B 700 Hz

C 350 Hz

D 50 Hz

1

2

3

4

5

6

7

09 : 51



6/10



10 min



Hint

Q : If the shift of wavelength of light emitted by a star is towards blue, then this shows that star is:



Stationary



Moving away from earth



Moving towards earth



Information is incomplete

1

2

3

4

5

6

7

09 : 49



7/10



10 min



Hint

Q : What kind of wave is formed in organ pipes?



Transverse stationary waves



Electromagnetic waves



Mechanical waves



Longitudinal stationary waves

3

4

5

6

7

8

9

09 : 48



8/10



10 min



Hint

Q :

A pipe closed at one end has length 25cm, the wavelength of first harmonic will be:



25cm



50cm



100cm



200cm

3

4

5

6

7

8

9

09 : 47



9/10



10 min



Hint

Q :

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

A

**Pipe is open at both the ends**

B

Pipe is closed at both the ends

C

One end open and another end is closed

D

None of the above

3

4

5

6

7

8

9

09 : 46



9/10



10 min



Hint

Q :

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

A

**Pipe is open at both the ends**

B

Pipe is closed at both the ends

C

One end open and another end is closed

D

None of the above

3

4

5

6

7

8

9

09 : 44



10/10



10 min



Hint

Q :

In open organ pipe, if fundamental frequency is  $n$  then the other frequencies are



$n, 2n, 3n, 4n$



$n, 3n, 5n$



$n, 2n, 4n, 8n$



None of these

4

5

6

7

8

9

10



## TEST

### Test Level-1 (Topic-6 Waves)



20 Questions



15 min

#### Topics

Progressive wave, Transverse and longitudinal waves, Periodic wave, Principle of superposition, Stationary waves, Stationary waves in a stretched string, Stationary waves in air columns, Stationary waves in closed organ pipe, Doppler effect, Applications of Doppler effect

[Start Test](#)

14 : 56



1/20



15 min



Hint

Q : A sound source is moving towards

stationary listener with  $\frac{1}{10^{\text{th}}}$  the speed of sound. The ratio of apparent to real frequency is:



$$\frac{11}{10}$$



$$\left[\frac{11}{10}\right]^2$$



$$\left[\frac{9}{10}\right]^2$$



$$\frac{10}{9}$$

1

2

3

4

5

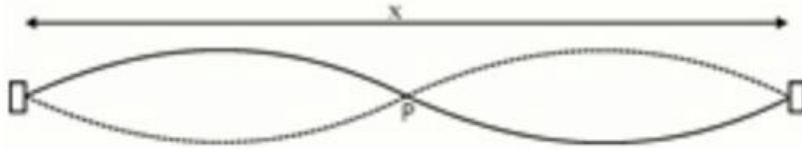
6

7

14 : 53



Q : The diagram represents a stationary wave on a stretched string.



What is represented by point P and by the length x?

Point P	Length x
antinode	one wavelength
antinode	two wavelength
node	one wavelength
node	two wavelength

**A** antinode, one wavelength

**B** antinode, two wavelength

**C** node, one wavelength

**D** node, two wavelength

1

2

3

4

5

6

7

14 : 51



3/20



15 min



Hint

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



1024



512



256



128

1

2

3

4

5

6

7

14 : 50



4/20



15 min



Hint

Q : During superposition of two waves of the same frequency which are out of phase have resultant displacement

A remain same

B increases

C zero

D decreases

1

2

3

4

5

6

7

14 : 48



5/20



15 min



Hint

Q : When the antinodes are all at their extreme displacements, the energy stored is

A

K.E

B

P.E

C

thermal energy

D

all of these

1

2

3

4

5

6

7

14 : 47



6/20



15 min



Hint

Q : Doppler's effect is applicable to



Sound waves



Electro magnetic waves



Radio waves



All of these

1

2

3

4

5

6

7

14 : 46



7/20



15 min



Hint

Q : The fundamental frequency of stationary wave is

A  $f = \frac{1}{2l} \sqrt{\frac{m}{f}}$

B  $f = \frac{1}{2l} \sqrt{\frac{F}{m}}$

C  $f = \frac{v}{l}$

D  $f = \frac{1}{2vl}$

1

2

3

4

5

6

7

14 : 43



8/20



15 min



Hint

Q : A stationary wave is set up in the air column of a closed pipe. At the closed end of the pipe

A

Always a node is formed

B

Always an antinode is formed

C

Neither node nor antinode is formed

D

Sometimes a node and sometimes an antinode is formed

4

5

6

7

8

9

10

14 : 40



9/20



15 min



Hint

Q :

A source of sound of frequency 450 cycles/sec is moving towards a stationary observer with 34 m/sec speed. If the speed of sound is 340 m/sec, then the apparent frequency will be



410 cycles/sec



550 cycles/sec



500 cycles/sec



450 cycles/sec

4

5

6

7

8

9

10

14 : 38



10/20



15 min



Hint

Q : The sonometer wire is vibrating in the second overtone. We may say that there are:



Two nodes and two antinodes



One nodes and two antinodes



Four nodes and three antinodes



Three nodes and three antinodes

4

5

6

7

8

9

10

14 : 35



11/20



15 min



Hint

Q : In a closed end organ pipe the fundamental frequency is  $f$ . what will be the ratio of frequencies of the next three overtones?



2: 3: 4



3: 7: 11



3: 4: 5



3: 5: 7

10

11

12

13

14

15

16

14 : 34



12/20

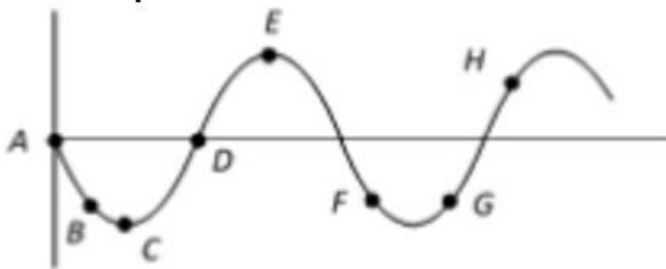


15 min



Hint

Q : The diagram below shows the propagation of a wave. Which points are in same phase?



A

F, G

B

B and G

C

C and E

D

B and F

10

11

12

13

14

15

16

14 : 33



13/20



15 min



Hint

Q : In which of the following, Doppler's effect is not applicable?



To find speed of satellite



To find speed of star



To find objects under water



To tune a musical instrument

10

11

12

13

14

15

16

14 : 31



14/20



15 min



Hint

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



Transverse waves



Longitudinal waves



Propagated waves



Magnetic waves

10

11

12

13

14

15

16

14 : 29



15/20



15 min



Hint

Q : A boat at anchor is rocked by waves, whose crests are 100m apart and velocity is 25m/s. The boat bounces up once in every

A 2500s

B 75s

C 4s

D 0.25s

10

11

12

13

14

15

16

14 : 28



16/20



15 min



Hint

Q :

If a wave travelling at a speed of 130 m/s and has a wavelength of 5m. Then find out the frequency of the wave?



650 Hz



20 Hz



$3.8 \times 10^2$  Hz



26 Hz

0

11

12

13

14

15

16

14 : 26



17/20



15 min



Hint

Q : If the phase difference between the two wave is  $2\pi$  during superposition, then the resultant amplitude is



Maximum



Minimum



Maximum or minimum



None of the above

14

15

16

17

18

19

20

14 : 24



18/20



15 min



Hint

Q : In a stationary wave all the particles



On either side of a node vibrate in same phase



In the region between two nodes vibrate in same phase



In the region between two antinodes vibrate in same phase



Of the medium vibrate in same phase

14

15

16

17

18

19

20

14 : 23



19/20



15 min



Hint

Q : A string of 7 m length has a mass of 0.035 kg. If tension in the string is 60.5 N, then speed of a wave on the string is



77 m/s



102 m/s



110 m/s



165 m/s

14

15

16

17

18

19

20

14 : 22



20/20



15 min



Hint

Q :

If the length of a closed organ pipe is 1.5 m and velocity of sound is 330 m/s, then the frequency for the second note is



220 Hz



165 Hz



110 Hz



55 Hz

4

15

16

17

18

19

20



TEST

## Test Level-2 (Topic-6 Waves)



30 Questions



25 min

Topics

WAVES

**Start Test**

24 : 58



1/30



25 min



Hint

Q : The ratio of frequencies in a stretched string is:



1 : 2 : 3



1 : 3 : 5



2 : 4 : 6



3 : 2 : 1

1

2

3

4

5

6

7

24 : 57



2/30



25 min



Hint

Q : In a stationary wave the distance between consecutive antinodes is 25 cm. If the wave velocity is  $300 \text{ ms}^{-1}$ , then the frequency of wave will be



150 Hz



300 Hz



600 Hz



750 Hz

1

2

3

4

5

6

7

24 : 55



3/30

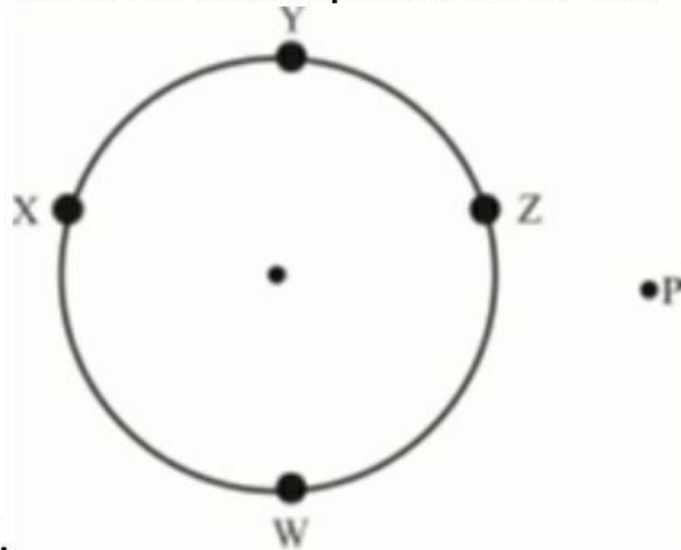


25 min



Hint

Q : A sound source rotates anti-clock wise with an angular velocity  $\omega$ . Radius of the circle is  $R$ . A person is at  $P$ . The maximum frequency is heard when position of the



source is at.



Y



X

1

2

3

4

5

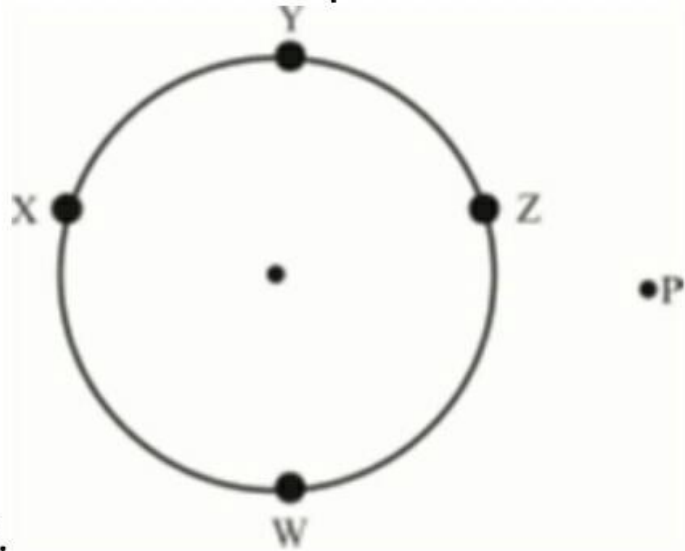
6

7

24 : 53



circle is R. A person is at P. The maximum frequency is heard when position of the



source is at.

A Y

B X

C Z

D W

1

2

3

4

5

6

7

24 : 52



4/30



25 min



Hint

Q : Bats navigate and find food by



Ultrasonics



Polarization



Echolocation



Refraction

1

2

3

4

5

6

7

24 : 51



5/30



25 min



Hint

Q : A stationary wave is established in a string which vibrates in four segments at a frequency of 120 Hz. Its fundamental frequency is



15Hz



60 Hz



30 Hz



480 Hz

1

2

3

4

5

6

7

24 : 50



6/30



25 min



Hint

Q : A pipe closed at one end has length 50cm, the wavelength of first harmonic will be:

A 25cm

B 50cm

C 100cm

D 200cm

1

2

3

4

5

6

7

24 : 47



7/30



25 min



Hint

Q : When the source of sound moves towards the stationary observer, the value of apparent frequency ' $f_o$ ' is:

A  $f_o = \left( \frac{v+u}{v} \right) f$

B  $f_o = \left( \frac{v}{v-u} \right) f$

C  $f_o = \left( \frac{v}{v+u_2} \right) f$

D  $f_o = \left( \frac{v-u}{v} \right) f$

1

2

3

4

5

6

7

24 : 45



8/30



25 min



Hint

Q : The red shift measurement of Doppler effect of galaxies indicate that the universe is

A Expanding

B Contracting

C Stationary

D Oscillating

4

5

6

7

8

9

10

24 : 44



9/30



25 min



Hint

Q : A source of frequency  $f$  sends waves of wavelength  $\lambda$  traveling with speed  $v$  in some medium. If the frequency is changed from  $f$  to  $2f$ , then the new wavelength and new speed are (respectively):

A  $2\lambda, v$

B  $\lambda/2, v$

C  $\lambda, 2v$

D  $\lambda, v/2$

4

5

6

7

8

9

10

24 : 43



10/30



25 min



Hint

Q : The third harmonic in an open organ pipe is known as



Fundamental frequency



Second overtone



Third overtone



First overtone

4

5

6

7

8

9

10

24 : 40



11/30



25 min



Hint

Q : The length of a string is 1m, tension in it is 40N and mass of the string is 0.1 kg. Then the velocity of transverse waves produced in the string will be:



400 ms<sup>-1</sup>



180 ms<sup>-1</sup>



80 ms<sup>-1</sup>



20 ms<sup>-1</sup>

7

8

9

10

11

12

13

24 : 39



12/30



25 min



Hint

Q : Which of the following is not an application of superposition principle?



interference



stationary waves



beats



none

7

8

9

10

11

12

13

24 : 35



13/30



25 min



Hint

Q : Which of the following gives three regions of the electromagnetic spectrum in order of increasing wavelength?



Gamma rays, microwaves, visible radiation



Radio waves, ultra-violet, X-rays



Ultra-violet, infra-red, microwaves



Visible radiation, gamma rays, radio waves

7

8

9

10

11

12

13

24 : 33



14/30



25 min



Hint

Q :

A closed organ pipe has fundamental frequency 100 Hz. What frequencies will be produced if its other end is also opened?



200, 300, 400, 500



200, 400, 600, 800



100, 300, 500, 700



100, 200, 300, 400

10

11

12

13

14

15

24 : 31



15/30



25 min



Hint

Q : The wavelength of wave is 1m and period is 2sec. Its speed is



2 ms<sup>-1</sup>



5 ms<sup>-1</sup>



0.5 ms<sup>-1</sup>



None of these

10

11

12

13

14

15

24 : 29



16/30



25 min



Hint

Q : For a closed organ pipe resonance is occurred when air columns of lengths are equal to



$$\frac{\lambda}{1}, \frac{\lambda}{2}, \lambda$$



$$\frac{\lambda}{2}, \lambda, 3\lambda$$



$$\frac{\lambda}{2}, \frac{3\lambda}{2}, \frac{5\lambda}{2}$$



$$\frac{\lambda}{4}, \frac{3\lambda}{4}, \frac{5\lambda}{4}$$

15

16

17

18

19

20

21

24 : 28



17/30



25 min



Hint

Q : Which one of the following is the correct?

A

Distance between two consecutive nodes	Distance between two consecutive crests
$\lambda$	$\lambda$

B

Distance between two consecutive nodes	Distance between two consecutive crests
$\frac{\lambda}{2}$	$\frac{\lambda}{2}$

C

Distance between two consecutive nodes	Distance between two consecutive crests
$\frac{\lambda}{2}$	$\lambda$

15

16

17

18

19

20

21

24 : 20



18/30



25 min



Hint

Q : The distance between 1<sup>st</sup> node and 4<sup>th</sup> antinode is:



$$\frac{7}{4}\lambda$$



$$13\frac{\lambda}{4}$$



$$5\frac{\lambda}{4}$$



$$11\frac{\lambda}{4}$$

15

16

17

18

19

20

24 : 18



19/30

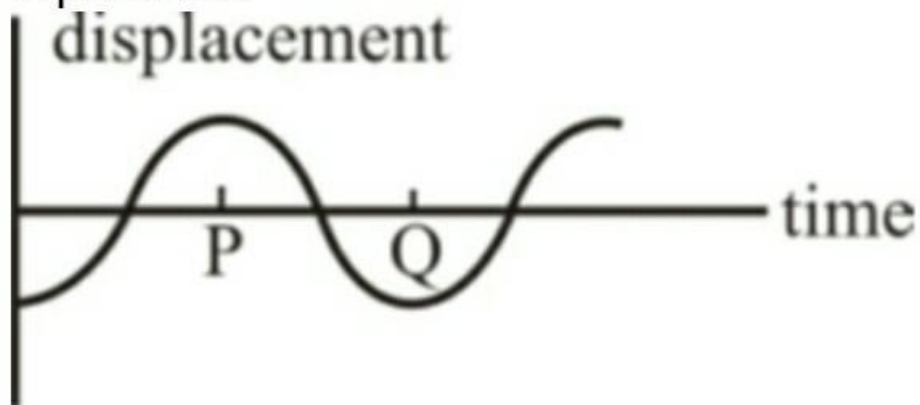


25 min



Hint

Q : In the diagram below, the interval PQ represents



A

Wavelength/2

B

2 × amplitude

C

Wavelength

D

Period/2

15

16

17

18

19

20

24 : 14



20/30



25 min



Hint

Q : A source of sound of frequency 500 Hz is moving towards an observer with velocity  $30 \text{ ms}^{-1}$ . The speed of sound is  $330 \text{ ms}^{-1}$ . The frequency heard by observer will be:



550 Hz



458.3 Hz



530 Hz



454.5 Hz

15

16

17

18

19

20

24 : 12



21/30



25 min



Hint

Q : The vibrations produced in prongs of the tuning fork are



Transverse



Stationary



Longitudinal



Electromagnetic

19

20

21

22

23

24

24 : 11



22/30



25 min



Hint

Q : In which case increase in wavelength causes an apparent decrease in the frequency of sound waves for the listener



When listener is moving towards stationary sound source



When listener is moving away from stationary sound source



When sound source is moving towards stationary listener



When sound source is moving away from stationary listener

19

20

21

22

23

24

24 : 09



23/30



25 min



Hint

Q : 100 waves pass through the medium in one second with speed of 10 m/s. The wavelength of waves is:



1 m



0.1 m



0.01 cm



1 cm

19

20

21

22

23

24

24 : 08



24/30



25 min



Hint

Q : When two identical traveling waves are superimposed, velocity of resultant wave



decreases



remains same



increases



becomes zero

19

20

21

22

23

24

24 : 06



25/30



25 min



Hint

Q : Type of waves used in "sonar" are



electromagnetic waves



water waves



matter waves



sound waves

24

25

26

27

28

29

24 : 04



26/30



25 min



Hint

Q : In the stretched string if speed of the wave is doubled, the tension will be



2 times



8 times



4 times



6 times

24

25

26

27

28

29

24 : 03



27/30



25 min



Hint

Q : In an open end pipe, first overtone is produced, when the length of pipe is



$$\frac{\lambda}{4}$$



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



$$\frac{\lambda}{3}$$



$$\lambda$$

24

25

26

27

28

29

24 : 02



28/30



25 min



Hint

Q : The fundamental frequency of a string is proportional to



Inverse of the length



The diameter



Tension



Density

24

25

26

27

28

29

24 : 01



29/30



25 min



Hint

Q : If velocity of sound in air be  $350 \text{ ms}^{-1}$ , then the fundamental frequency of an open pipe of length 100 cm is:



175 Hz



350 Hz



700 Hz



500 Hz

24

25

26

27

28

29

23 : 59



30/30



25 min



Hint

Q : Doppler Effect is used to monitor blood flow through major arteries by ultrasound waves of frequency.

A 5 Hz to 10 Hz

B 5 MHz to 10 MHz

C 5 kHz to 10 kHz

D 5 GHz to 10 GHz

24

25

26

27

28

29

30