HW
18/1/22

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Home Assignment

1) Two tuning forks, A and B vibrate with frequencies in the ratio 2:7 and their wavelengths in the ratio 3:4 respectively. Find the tuning fork producing greatere velocity of sound.

A	B
$f = 2x$	$f = 7x$
$\lambda = 3a$	$\lambda = 4a$
$V_A = 6ax$	$V_B = 28ax$

$V = f\lambda$

Ans) (2) Tuning fork 'B'.

The tuning fork A produces relatively

Ans) (2) Flat sound than tuning fork 'B'.

2) State two practical uses or applications of echo.

Applications of Echo :-

(i) Dolphins detect their enemy and obstacles by emitting the ultrasonic waves and hearing their echo.

(ii) In medical science, the echo method of ultrasonic waves is used for imaging human organs such as the liver, gall bladder, etc.

3) Give Reasons:

(a) The reverberation time of a hall used for speeches should be a very short

If reverberation time of a hall is long, then the multiple echoes will interfere with original sound. Hence, nothing will be heard distinctly. For this reason, the reverberation time of the hall should be very short.

(b) A vibrating body produces sound. However no sound is heard when a simple pendulum oscillates in air.

The audible range of human ear is 20 Hz to 20,000 Hz, as the frequency of the oscillating pendulum is lower than 20 Hz, therefore no sound is heard.

(c) Sounds of same loudness and pitch but produced by different musical instrument like a violin and flute are distinguishable.

Due to the characteristic of quality or timbre of sound waves, the two sounds are distinguishable.

4) A stone is dropped from the top of a tower 125m high into a pond of cd the base of the tower. When is the splash heard at the top ($g = 10\ m/s^2$ and speed of sound = 340 m/s)

Given,

$h = 125\ m$

$g = 10$

$v = 340$

$s = ut + \frac{1}{2}at^2$

$h = ut + \frac{1}{2}gt^2$

$125 = 0 + \frac{1}{2}(10)t^2$

$125 = 5t^2$

$t^2 = 25$

$t = 5$ secs

$t' = \frac{h}{v}$

$t' = \frac{125}{340}$

$t' = 0.36$ secs.

$T = t' + t = 0.36 + 5 = 5.36$ secs

(Ans)

5) "A sound wave with frequency higher than 20kHz is not audible for human ear." Answer the following in respect of this statement.

(i) What is the term used for such a sound?

(ii) Name two organisms producing sound in this range.

(iii) Write an application of such a wave.

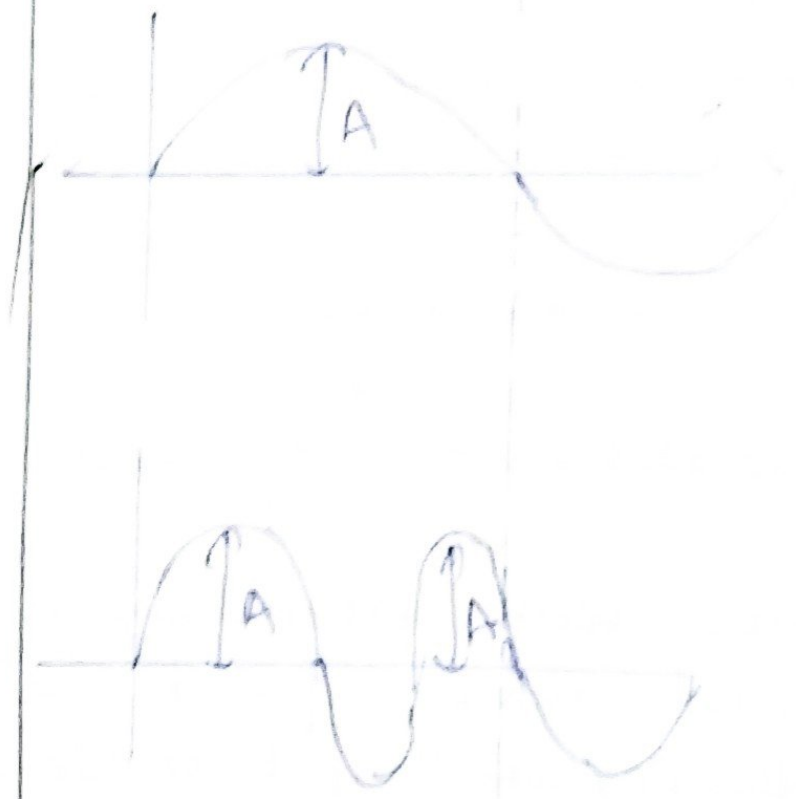
Ans (i) Ultra sonic sound.

(ii) Bats, Dog.

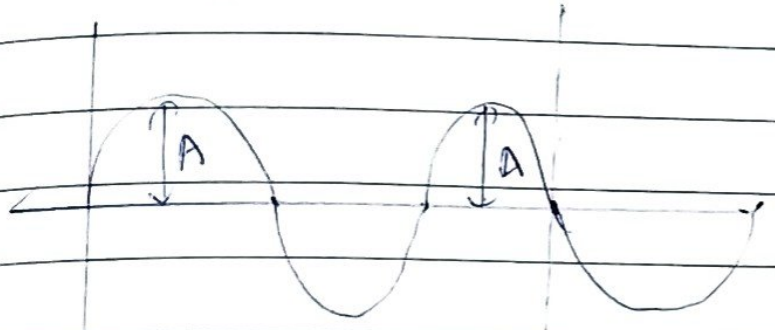
(iii) Used to break the small stones in kidney

6) Represent graphically two sep. seperate diagrams in each case:

(a) Two sound waves having same amplitude but different frequencies.



(b) Two sound waves with same frequency and different amplitudes.



(i) Two sound waves having varying amplitudes and different wavelengths.