CISCE VIRTUAL LEARNING SERIES

LESSON: ICSE PHYSICS (SCIENCE PAPER 1)

SOUND (FREE AND FORCED VIBRATIONS)

September 29th, 2020

Response to Questions posed by students during the live Lesson:

S.No.	Questions	Answers
1.	What is Supersonic sound?	Any speed more than the speed of sound is Supersonic.
2.	What is Ultrasonic sound?	Any sound of frequency above 20,000Hz is ultrasonic sound.
3.	Does sound propagate in the form of particle nature or wave nature?	According to classical theory it has wave nature and not particle nature. It is merely density variations in a medium. (Not in the scope of the syllabus)
4.	How is frequency dependent on the wavelength of the sound?	Frequency and wavelength are inversely proportional to each other.
5.	Does a sound wave require a medium?	Yes, sound needs a medium to travel.
6.	Define resonance.	Resonance is a particular case of forced vibrations when the frequency of forced vibrations matches with the natural frequency of the body and the body begins to vibrate with increased amplitude.
7.	What is inertia?	Tendency of a body to be in its state which is measured in terms of the mass of a body.

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8.	What is infrasonic?	Any frequency less than 20 Hz is called as infrasonic.
9.	What is the relation between frequency and amplitude of a wave?	There is no corelation between the frequency and amplitude.
10.	Does sound wave travel in uniform motion?	Yes, in a given medium its speed remains the same.
11.	What is the difference between DAMPED and FORCED vibration?	Free vibrations of gradually decreasing amplitude due to the frictional resistance of the medium is damped vibrations. During this amplitude decreases continuously. Forced vibrations are the vibrations under the influence of external periodic force. Due to this the amplitude may increase or decrease.
12.	Will the pendulum in vacuum keep on oscillating?	Yes, provided there is no friction at the point of support.
13.	What is natural frequency?	The frequency of free vibrations is called as natural frequency.
14.	Which type of Vibration does a tuning fork have?	Tuning fork shows mechanical vibrations (transverse) in prongs.
15.	What is the effect on the oscillations of a pendulum if the friction is increased?	The amplitude of vibration will decrease faster.
16.	What is a 'Crest' and 'Trough'?	During propagation of a transverse wave the point of maximum positive displacement is crest and maximum negative displacement is trough.
17.	What are ultrasonic waves?	Any wave of frequency above 20,000Hz is ultrasonic wave.

S.No.	Questions	Answers
18.	What is the speed of sound of frequency 800Hz having wavelength 40 cm?	$V = f\lambda \therefore V = 800 \times \frac{40}{100} = 320$ ms^{-1}
19.	Define damped vibrations?	Natural vibrations of gradually decreasing amplitude are damped vibrations.
20.	Classify the following as free and forced vibrations. (a) Vibrations of a tuning fork in vacuum. (b) The vibrations produced in a railway platform when a train passes by the platform.	 Free vibrations. Forced vibrations