

CHAPTER - 7

Teacher: Charanjeet Kaur

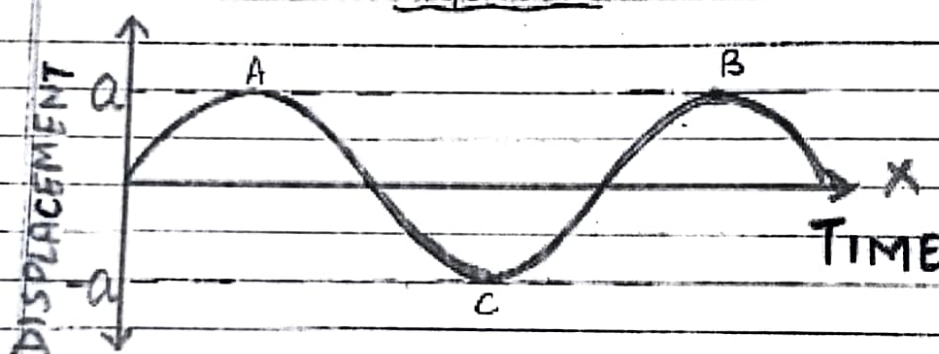
Good Morning students. This lesson is of class-X for the subject of 'Physics', Topic - 'Natural, Damped and Forced Vibrations and Resonance' which is covered in Chapter-7 'Sound' and this particular topic is on page Number-155 of your textbook, titled - 'Concise Physics by Pelina Publications' and is being submitted to you on 8th May, 2023.

NATURAL VIBRATIONS: The periodic vibrations of a body in the absence of any external force on it, are called natural (or free) vibrations.

A body, capable of vibrating, has a constant natural frequency of its vibrations and its amplitude of vibration remains constant.

(see below given Figure - 1)

FIGURE - 1



Points A, B, C shows maximum displacement of vibrating particle as compared to its mean position. It can be observed in figure-1, that the value of amplitude remains constant in such (natural) vibrations.

Every object has its own unique frequency that it naturally tends to vibrate at.

Adjoining picture shows, **TUNING FORK**

(of different lengths)



CHAPTER-7

SOUND

Students, such vibrations of a constant amplitude can occur only in vacuum because the surrounding medium offers resistance to the motion or we can say due to opposing or frictional forces provided by the surrounding medium, the energy of the vibrating body continuously decreases due to which the amplitude of vibration gradually decreases.

Students now you have to pause this session for 5 minutes and in the meantime I want you to take a thread of around 30cm length and stretch it from both of its end. Students, you will be needing a volunteer for your help too. So ask anyone who is free at your home to provide you with a little help. In fact, tell your helper to stretch the thread from its end but not to break it and you pluck this stretched thread from its centre. Kindly write in your Physics Notebook what you observe and then resume this session for further explanation.

Students you may now pause the interactive session and perform the earlier said experiment.

Students, now you must have experienced that there were certain vibrations when you plucked the thread but those vibrations ceased very quickly. This happened because of friction provided by air which is also known as air friction.

Imagine if there was no air or no medium, then there would have been no forces to oppose the vibrations produced by thread and then those vibrations would have been termed as NATURAL VIBRATIONS.