

CISCE VIRTUAL LEARNING SERIES

LESSON: ICSE PHYSICS (SCIENCE PAPER 1)

RESONANCE

September 30th, 2020

Response to Questions posed by students during the live Lesson:

| S.No. | Questions | Answers |
|-------|---|--|
| 1. | Does the amplitude remains constant in resonance? | No, amplitude keeps on increasing and becomes maximum. |
| 2. | What are factors affecting resonance? | <ul style="list-style-type: none">• Frequency of the forced vibration (it should match the natural frequency)• System should be close enough for the transfer of energy. |
| 3. | How can we identify the filling of a bottle when kept under a tap of running water? | As the bottle is being filled the length of the air column in the bottle keeps on decreasing. Frequency is inversely proportional to the length of the air-column. Thus, it increases increasing the pitch of the sound. The increase in the pitch enables us to identify the filling of the bottle. |
| 4. | What is SONAR? | Sound Navigation and Ranging |
| 5. | Do objects vibrate with natural frequency only in vacuum? | No, they do vibrate with natural frequency in a medium too but amplitude keeps on decreasing. |
| 6. | What are sympathetic vibrations? | Vibrations produced by one vibrating body in exactly identical body with same frequency is called as sympathetic vibrations. |

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| 7. | Why are stringed instruments like guitar provided with a hollow sound box? | Hollow sound box has greater surface area. When string is plucked greater volume of air is set into vibration and more energy is transmitted in the medium. This increases the loudness of sound. |
| 8. | What is the name of the bridge which collapsed due to resonance? | Tacoma narrow bridge in US, Angers bridge in France. |
| 9. | Does sound travel in vacuum? | No, sound need material medium. |
| 10. | What is the difference between natural vibration and free vibration? | Free vibrations means the natural vibrations. They are the same. |
| 11. | Natural frequency depends on which factors? | Natural frequency depends on the size and shape of the body. |
| 12. | Why identical glasses when filled up to a different extent produce different sound? | <ul style="list-style-type: none"> • When the glasses are filled up to different extent, the length of air-column is different. • Frequency is inversely proportional to the length of the air-column. Thus they produce sounds of different pitch. |
| 13. | In the pendulum experiment, if it is conducted in a vacuum will both the pendulums with equal length vibrate equally without alternating amplitude? | They will vibrate with maximum amplitude alternately. Not at the same time. |
| 14. | Is it possible that the natural vibrations of a body be the forced vibrations for another body? | Yes, it is possible. |
| 15. | Name the phenomenon involved when we tune a radio set to a particular station. | Resonance. |

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| 16. | What is the definition of 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. |
| 17. | What is sonometer? | It is an instrument in the form of hollow sound box which can be used to investigate the relation between frequency and tension in the string, length of the string and linear density. |
| 18. | Can resonance take place in machine parts? | Yes, it can take place in machine parts. |
| 19. | What determines the intensity of a sound wave? | The amount of sound energy transferred normally through unit area in unit time determines the intensity of sound wave. |
| 20. | Can a resonant frequency be different from the natural frequency of a resonating body? | It is possible in the air-column when resonance takes place in air-columns having length which is an integral multiple of a resonating air-column. (Not in the scope of syllabus of ICSE) |