

# 5. ACOUSTICS

## Learning Objectives

By the end of this section, the students will be able to:

- Understand how sound is produced and transmitted.
- Relate the speed of sound, its frequency, and its wavelength.
- Know the speed of sound in various media.
- Explain the factors affecting the speed of sound in a gaseous medium.
- Demonstrate the phenomenon of reflection of sound.
- Determine the speed of sound using the method of echo.
- Understand Doppler Effect.
- Solve numerical problems related to the above topics.

## Important Notes and Results

- ❏ The Clapping portico in Golconda Fort is a series of arches on one side, each smaller than the preceding one. So, a sound wave generated under the dome would get compressed and then bounce back amplified sufficiently to reach a considerable distance.
- ❏ The medium in which the velocity of sound decreases compared to other medium is called denser medium. (Air is denser compared to water for sound).
- ❏ The medium in which the velocity of sound increases compared to other medium is called rarer medium. (Water is rarer compared to air for sound).
- ❏ One of the famous whispering galleries is in St. Paul's cathedral church in London. It is built with elliptically shaped walls. When a person is talking at one focus, his voice can be heard distinctly at the other focus. It is due to the multiple reflections of sound waves from the curved walls.
- ❏ Whenever there is a relative motion between a source and a listener, the frequency of the sound heard by the listener is different from the original frequency of sound emitted by the source. This is known as "Doppler effect".