

Write an essay on acoustics of building.

The branch of physics which deals with producing and controlling the factors relating to the design and construction of cinema halls, auditoriums, concert halls, theaters, etc, so that the speech, music and singing are distinctly audible, faithfully reproduced (without any distortion) and are pleasant to listen to, is called acoustics of buildings.

W.C. Sabine, Professor of physics, Harvard University, in 1911, first of all scientifically tackled the problem of satisfactory speech and music in a hall and laid down the following essential features about the good acoustics.

(1) The sound heard must be sufficiently loud in every part of the hall and no echoes should be present.

- ② The total quality of the speech and music must be unchanged i.e., the relative intensities of the several components of a complex sound must be maintained.
- ③ For the sake of clarity, the successive syllables spoken must be clear and distinct i.e., there must be no confusion due to overlapping of syllables.
- ④ The reverberation should be quite proper i.e., neither too large nor too small. The reverberation time should be 1 to 2 seconds for music and 0.5 to 1 second for speech.
- ⑤ There should be no concentration of sound in any part of the hall.
- ⑥ The boundaries should be sufficiently sound proof to exclude extraneous noise.
- ⑦ There should be no Echelon effect.
- ⑧ There should be resonance within the building.

Following factors affect the architectural acoustics :

- ① Reverberation
- ② Adequate loudness
- ③ Focussing due to walls and ceilings
- ④ Absence of echoes.
- ⑤ Freedom from resonance.
- ⑥ Echelon effect
- ⑦ Extraneous noise and sound insulation
 - (i) Air borne noise
 - (ii) Structure borne noise and
 - (iii) Inside noise.

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