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43 (ARC-6) 6-6

2018

BUILDING SERVICES-IV

Paper : ARC-6-6

Full Marks : 100

Time : Three hours

**The figures in the margin indicate
full marks for the questions.**

Answer all questions.

1. Answer the following : $5 \times 1 = 5$
 - (a) _____ is normally heard as a high-frequency ringing or buzzing.
 - (b) The room where most of the sound waves get absorbed by the surrounding in known as _____.
 - (c) Sound is a _____ wave.
 - (d) Velocity of sound in pure water is _____.
 - (e) The threshold of pain is _____ dB.

Contd.

2. Write short notes on : **(any five)**

5×5=25

(a) Intensity of sound

(b) Creep echo

(c) Inverse square law

(d) Dead spot

(e) Pitch and Tone

(f) Masking of sound

(g) Sabine's law.

3. Discuss constructional and planning measures for good acoustical design of auditorium with neat sketches.

20

4. Answer the following : **(any three)**

3×10=30

(a) Explain why acoustics is studied in the field of Architecture.

(b) Discuss noise control methods at outdoors.

(c) What is an acoustical material? Elaborate *any three* types.

(d) Discuss acoustical design consideration for studios.

5. What is Transmission Loss (TL) ?

A 12.5ft^2 window with a TL of 20dB in a 100ft^2 brick wall which has a TL of 50dB . Find the composite TL of this window wall construction. 10

OR

Define NRC.

Find the TL for the 90ft^2 common partition between the two adjoining dormitory rooms of size 10ft by 12ft each. Ceiling height in the rooms is 9ft , sound absorption coefficients are 0.04 for gypsum board walls and ceiling and 0.69 for the carpeted floor. Absorption of the bed is 15 sabins. Noise level in the receiving room should not exceed 22dB . Likely noise level from stereo in the source room is 82dB .

6. What is Reverberation time ?

A classroom 60ft long by 35ft wide by 15ft high has sound absorption coefficients of 0.30 for walls, 0.04 for ceiling, and 0.10 for floor. All coefficients are at 500Hz.

10

(a) Find the reverberation time T at 500Hz in this space with no occupants and no sound-absorbing treatment.

(b) Find the reverberation time T if 50% of the ceiling surface is treated with acoustical panels with sound absorption coefficient 0.85.