43 (B.ARCH-6) 6·6

2015

BUILDING SERVICES - IV
(Acoustic)

Paper : ARC 6·6

Full Marks : 100

Time : Three hours

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

1. Fill in the blanks : 1×5=5

   (i) Acoustics is achieving a _____ and _____ within a Building.

   (ii) Velocity of sound in brick _____ m/s.

   (iii) Full form of NRC is _____ .

   (iv) Full form of APS is _____ .

   (v) Two ways to reduce the reverberation time of a room are _____ and _____ .

2. Write short notes on : ***(any five)*** 4×5=20

(i) Echo

(ii) Decibel scale

(iii) Loudness

(iv) Inverse square law

(v) Resonance

(vi) Floated floor.

3. Answer the following : ***(any four)*** 5×4=20

(i) Explain inverse square law with needful sketches and examples.

(ii) What is an acoustic material? What are its types? Elaborate *any three* types.

(iii) What is acoustics? Why acoustics as a subject is studied in architecture?

(iv) Calculate total SIL (sound intensity level) caused by combination of levels of $95dB$ and $90dB$. The reference $I_0 = 1\times10^{-1} W/sqm.$

(v) An auditorium with volume 7×10^4 cft has reverberation time of $0{\cdot}9sec$ when empty. What will be the reverberation time when an audience of 250 persons is present? Take $K = 0{\cdot}05$ and absorption coefficient per person is 4.

4. Answer the following : ***(any four)*** 10×4=40

(i) Discuss the nature of sound in the following spaces. Support with helpful sketches.

(a) Lecture hall

(b) Music hall

(ii) What is noise? What are its indoor and outdoor sources?

(iii) Draw the section of an auditorium to show the propagation of sound using different sound reflectors?

(iv) Explain the acoustical defects and remedies with needful sketches, for Queen Elizabeth Hall, London.

(v) Explain the acoustical defects and remedies of Royal Exchange Theatre, Manchester, with necessary diagrams.

5. What is sound insulation? Why is it required? Give *three* approaches to sound insulation. 15