CBCS SCHEME

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15ARC73

Seventh Semester B.Arch. Degree Examination, Feb./Mar. 2022
Building Services – IV

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain in detail various factors responsible for good acoustic design for a multipurpose auditorium. With the help of neat sketches and labels. **(08 Marks)**

b. Differentiate between sound absorption and sound insulation. **(04 Marks)**

c. Discuss the properties of various sound absorbing and insulating materials. **(08 Marks)**

OR

2 a. Define speech intelligibility. **(06 Marks)**

b. Illustrate reverberation and reverberation time. Explain Sabine's equation. How does IT help in acoustic expert? **(09 Marks)**

c. Describe briefly the fundamental attributes of sound. **(05 Marks)**

Module-2

3 a. Write short notes :
i) Threshold of audibility and threshold of pain
ii) Sound absorption co-efficient
iii) Panel absorbers
iv) Sound concentration. **(12 Marks)**

b. Explain "Sound and Distance", inverse square law with equation and diagram. **(08 Marks)**

OR

4 a. Write short notes on :
i) Airborne noise
ii) Structure borne noise
iii) Pitch
iv) Cavity resonator. **(12 Marks)**

b. Define NRC value and its importance. How does it assist in making the choice of materials? **(08 Marks)**

Module-3

5 a. Elaborate upon the behavior of sound in an enclosed space with sketches. How shape, size and volume of the room affect acoustical performance. **(12 Marks)**

b. Distinguish between historic Greek and roman theaters with the help of sketches. **(08 Marks)**

OR

6 a. Illustrate with sketches :
i) Space absorbers
ii) Acoustical shadows
iii) Transmission loss. **(12 Marks)**

b. Draw neat sketches :
i) Floating Floor
ii) Machine isolation
iii) Staggered partition wall construction
iv) Masking of sound. **(08 Marks)**

Module-4

7 a. Recommend design ideas for equality acoustics for an auditorium having a eating capacity of 200 draw plan, section and 3D views of important areas. Assume suitable useful technical information. **(12 Marks)**

b. Explain in the causes of environmental noised in urban areas with examples. Suggest remedial measures to avoid unwanted sound in noisy areas. **(08 Marks)**

OR

8 a. Identify sources of indoor noise suggest measures to control the noise at source level. **(10 Marks)**

b. Demonstrate with sketches two measures to be taken to control excessive RT in Lecture Hall. **(10 Marks)**

Module-5

9 a. Solve the following :
Using Sabine equation :

$$RT_{60} = \frac{0.165V}{S\alpha} = \left(\frac{0.165 \times \text{volume}}{\text{total absorption in hall sabins}}\right)$$

A cinema hall has a volume of $10,000 m^3$. It is required to have a reverberation time RT_{60} of 1.5sec what should be the total absorption in the hall. **(14 Marks)**

b. List the various types of urban spaces which could be adopted in town planning to control the urban noise. With the help of neat sketches. **(06 Marks)**

OR

10 a. Elaborate on classification of industrial noise with the help of neat sketches and discuss the various ways to reduce industrial noise. **(12 Marks)**

b. A large hall has to be divided into small cabins by erecting sound proof partitions. Suggest minimum three alternate details to construct partitions. **(08 Marks)**

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