CLASS: B.ARCH   SEMESTER : IV
BRANCH: ARCHITECTURE   SESSION : SP/19

SUBJECT: AR4301 BUILDING SERVICES- II

TIME: 3 Hours   FULL MARKS: 60

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
3. The missing data, if any, may be assumed suitably.
4. **Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)   What do you understand by the term 'Acoustics of a Building'?   [2]
Q.1(b)   Show that if sound power level is doubled, the resultant is only 3 dB more.   [4]
Q.1(c)   Mention basic requirements and conditions to be fulfilled for good acoustics of an auditorium.   [6]

Q.2(a)   Explain the limitations to Sabine's Equation for calculating R.T.   [2]
Q.2(b)   Explain briefly the role of 'variable absorbers' in multipurpose auditorium design.   [4]
Q.2(c)   What are the causes of excessive reverberation and causes of echoes? How do you correct the   [6]
         Optimum time of reverberation?

Q.3(a)   How do you classify the noises? Explain the modes of transmission of these noises.   [6]
Q.3(b)   Explain how 'architectural considerations' can help in reducing the urban noise.   [6]

Q.4(a)   Differentiate between the following: [3x4]
         (i) acoustics and sound insulation   (ii) sound insulation and sound absorption
         (iii) airborne noise and structure borne noise (iv) indoor noise and outdoor noise

Q.5(a)   Write short notes on the following: [3x4]
         (i) Hot spot and dead spot.
         (ii) Transmission loss.
         (iii) N-C Curve.
         (iv) Equal Loudness Contour.6.

Q.6(a)   An auditorium having rectangular shape has its dimension as 40mx30mx15m.The interior surfaces of   [6]
         the auditorium are covered by the following materials:
         Cement plaster walls= 1800 m^2
         Concrete floor= 1200 m^2
         Acoustex ceiling=1200 m^2
         Curtains on walls= 330 m^2
Q.6(b)   The capacity of such an auditorium is 2000 seats. Determine number of absorbing units , reverberation   [6]
         time, and extra absorbing units (for an optimum time of reverberation time= 1.2 seconds) if required,
         for the following audience factors:
         (i) No Audience   (ii) Full Audience

Q.7(a)   What are the general principles or considerations underlying the sound insulation in buildings?   [6]
Q.7(b)   Describe briefly the various constructional measures adopted for achieving noise control and sound   [6]
         insulation in buildings.

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