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Seventh Semester B. Arch Degree Examination, Dec.2018/Jan.2019 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 sensitivity of human hearing though threshold of audibility and pain. Also state the most sensitive frequency range of human hearing. (08 Marks)
- b. A long rectangular vaulted room is functioning as a music hall in a school. What are the possible acoustic defects in this space? Suggest measures to rectify the same. (12 Marks)

OR

- 2 a. State inverse square Law. What are the limitations and applications of this principle? (08 Marks)
- b. How is the acoustical quality of an enclosed space assessed though Sabine's law. (12 Marks)

Module-2

- 3 a. What is speech Intelligibility? How is it assessed by Articulation Index (AI)? Assessed. (06 Marks)
- b. Explain the functioning principle of Helmholtz resonators. State its applications. (08 Marks)
- c. What is NRC value for acoustic materials? How does it assist in making the choice of materials? (06 Marks)

OR

- 4 a. How is the acoustic absorption of various materials assessed objectively? State and explain the parameter. (06 Marks)
- b. Explain the necessity to have variable sound absorbers. Draw neat sketches of atleast three methods. (08 Marks)
- c. Explain the importance of acoustic diffusers. How can they be introduced in to an enclosed space? (06 Marks)

Module-3

- 5 a. What are the design considerations for halls of Music? Draw a section though atleast three rows of seating to show the system of raking applied. (10 Marks)
- b. What is speech privacy? Suggest atleast three strategies to achieve speech privacy in an open office plan. (10 Marks)

OR

- 6 a. A lecture hall needs to be given suitable acoustic treatment for its walls and ceiling. Suggest suitable materials and methods of installing the same to achieve efficient acoustic environment in the lecture hall. (10 Marks)
- b. What are the design considerations while locating and designing an open air theatre? (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Explain transmission of noise in a multistoried school building through neat sketches. (10 Marks)
- b. A conference room is located next to the Air handling unit in an office space. Suggest suitable construction details to isolate the conference room from the noise of the Air handling unit. (10 Marks)

OR

- 8 a. What is Transmission Loss? Suggest methods for treating the fenestrations (doors and windows) to achieve effective Transmission loss for an office building located on a high traffic road. (08 Marks)
- b. What is sound Transmission class? How is this an importance parameter to assess performance of partitions? (04 Marks)
- c. A gym located on the fourth floor of a building needs to be acoustically separated from the office space on the third floor. Suggest suitable detailing for the third floor ceiling and fourth floor flooring. (08 Marks)

Module-5

- 9 a. Explain the applications of acoustic barriers in industrial spaces. (10 Marks)
- b. A school building needs to be located on a site abutting an arterial road. Suggest site planning strategies and methods to prevent noise from the road entering the building. (10 Marks)

OR

- 10 a. Suggest methods to reduce air turbulence noise in a HVAC system. (10 Marks)
- b. Suggest strategies at Regional level and Urban district level to achieve acceptable noise levels in the surroundings. (10 Marks)
