

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION 2025)**

CLASS: BARCH
BRANCH: ARCHITECTURE & PLANNING

SEMESTER : Vth
SESSION : MO/2025

SUBJECT: AR301 ACOUSTICS

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 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 handbook/Graph paper etc. to be supplied to the candidates in the examination hall.
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Q.1(a)	Explain Sound and its measurement parameters.	[5] 1	1
Q.1(b)	Explain the importance of acoustical knowledge in shaping the architectural design.	[5] 2	3
Q.2(a)	Discuss sound insulation & sound absorption and its difference.	[5] 3	2
Q.2(b)	Explain Octave band and band number along with its importance.	[5] 2	2
Q.3(a)	A multipurpose hall 80ft. long by 40ft. wide by 16ft high has sound absorption coefficients 0.20 for walls, 0.1 for ceiling and 0.25 for floor. All α 's are at 500Hz. Find the reverberation time T at 500Hz without any occupant and what if you have to reduce the reverberation time to half of the obtained value in previous section by changing ceiling material, what should be the absorption coefficient of the new ceiling material?	[5] 4	4
Q.3(b)	Describe Electro-Acoustics and its application in building design. What are the different types of sound systems, and how does Electro-Acoustics differ from Architectural Acoustics?	[5] 2	3
Q.4(a)	Write short notes on any three of the following: A Digital Sound System. B. Surround sound system C. Duophonic system D. Background noise and desired sound pressure level	[5] 2	2
Q.4(b)	Explain airborne and structure borne noise and discuss NC curve and its role.	[5] 4	1
Q.5(a)	Discuss classification of sound absorbing materials and the properties of ideal acoustical absorbing materials? Name any three acoustical material and its usability and suitability in different building application.	[5] 4	2
Q.5(b)	What are the different types of acoustical defects found in an auditorium, and how can they be remedied through architectural design?	[5] 5	3

:::21/11/2025:::M