

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: B. ARCH.
BRANCH: Architecture & Planning

SEMESTER : Vth
SESSION : MO/2025

SUBJECT: AR301 ACOUSTICS

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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		CO	BL
Q.1(a)	Discuss role of acoustics in Architecture.	[2] 1	1
Q.1(b)	Discuss Sound and its main characteristics.	[3] 1	1
Q.2(a)	Discuss Pure tone, fundamental tone and Complex tone.	[2] 1	1
Q.2(b)	Explain Overtones and Harmonics with Examples.	[3] 1	2
Q.3(a)	Sound intensity is 10 W/m ² at 4 m distance from a point sound source then what would be the sound intensity at 2 m distance from the same point source?	[2] 2	3
Q.3(b)	What do you understand by threshold of hearing and threshold of pain along with related sound intensity level, explain briefly?	[3] 2	2
Q.4(a)	If there are two point source of loudness levels 50 dB, 54 dB please calculate the resultant loudness level observed by any listener.	[2] 1	3
Q.4(b)	Explain Reverberation and Reverberation Time, with respect to sound behavior in any interior environment.	[3] 3	3
Q.5(a)	The frequency (f) of a wave is 500 Hz and the speed of sound is 330 ms ⁻¹ . Calculate its Time period (T) and the wavelength (λ)?	[2] 1	3
Q.5(b)	A classroom 100ft. long by 40ft. wide by 20ft high has sound absorption coefficient α's 0.25 for walls, 0.05 for ceiling and 0.20 for floor. All α's are at 1000Hz. Find the reverberation time T at 1000Hz without any occupant and additional sound absorbing treatment.	[3] 3	3

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