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

CLASS: B. ARCH **SEMESTER: V**
BRANCH: ARCHITECTURE **SESSION: MO/2022**

SUBJECT: AR301 ACOUSTICS

TIME: 2 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 25.
2. Candidates attempt for all 25 marks.
3. Before attempting the question paper, be sure that you have got the correct question paper.
4. The missing data, if any, may be assumed suitably.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

				CO	BL
Q1	(a)	Define: *Sound power level, Sound pressure level, Sound intensity level.*	[2]	1	Remember
Q1	(b)	Differentiate between the *Intensity of Sound* and *Loudness of Sound.*	[3]	1	Remember
Q2	(a)	Explain briefly the general acoustical principles for an auditorium design.	[2]	1	Understand
Q2	(b)	Define and give the solution, supplemented with proper sketches, to avoid the following acoustical defects: (i) Flutter Echo (ii) Sound Shadow	[3]	2	Understand
Q3	(a)	Explain the limitations to Sabine's Equation for calculating R.T.	[2]	2	Understand
Q3	(b)	Explain the following acoustical phenomenon for an enclosed space: i) Sound Diffusion ii) Sound Transmission	[3]	2	Understand
Q4		Explain with proper sketches the acoustical design criteria for any one of the following- i. Lecture hall ii. Motion Picture Hall	[5]	4	Analysis
Q5		An auditorium having rectangular shape has its dimension as 30mx20mx8m.The areas of different surfaces used are:(i) cement plaster= 700 m^2 (a= 0.02) (ii) concrete floor= 600 m^2 (a=0.03) (iii) celotex ceiling= 600 m^2 (a=0.30) (iv) light curtains=100 m^2 (a=0.40) .The capacity of such a hall is of 900 wooden seats (a=0.02 M^2-Sabine per seat). Assume two third of the audience (a=0.44 M^2-Sabine per person) to be present work out the following:	[5]		
	(a)	Number of extra absorbing units required so as to get an optimum reverberation time of 1.2 seconds	[3]	3	Apply
	(b)	Coefficient of absorption for the extra absorbing material calculated in (a), provided the area for fixing the material is 680 m^2	[2]	3	Apply

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