CBCS SCHEME

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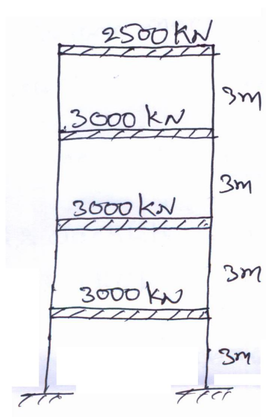
22CSE233

Second Semester M.Tech. Degree Examination, June/July 2024
Earthquake Resistant Structures

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.
3. Use of Codes IS : 1893 (Part 1) – 2002/2016, IS : 13920 – 1993 , IS 4320 – 1993 and IS13828 – 1993 are permitted.

		Module – 1	**M**	**L**	**C**
Q.1	**a.**	Explain Plate Tectonics and the associated types of movement at plate boundaries.	**10**	**L1**	**CO1**
	b.	Explain in detail the terms Magnitude of an earthquake , Intensity of an earthquake and Isoseismals.	**10**	**L1**	**CO1**
		OR			
Q.2	**a.**	Explain the concept of Base isolation and applications in structural design with sketches.	**10**	**L1**	**CO1**
	b.	Explain Earthquake risk evaluation and Mitigation.	**10**	**L1**	**CO1**
		Module – 2			
Q.3	**a.**	Draw the D – V – A response spectra and explain the construction procedure for the response spectrum.	**10**	**L2**	**CO2**
	b.	Differentiate between Design spectrum and Response spectrum. Explain the response spectrum as in IS – 1893 – 2002 indicating the factors on which response acceleration depends.	**10**	**L2**	**CO2**
		OR			
Q.4		A four storey RC (SMRF) hospital building as shown in Fig. Q4, is situated in Zone – IV. The dead load and live load is lumped in respective floors. The soil below the foundation is assumed to be hard rock. Determine the total base shear and distribute the base shear along the height of building as per IS 1893 – 2002 codal provision.  Fig. Q4.	**20**	**L3**	**CO2**

		Module – 3			
Q.5	**a.**	Differentiate between Soft storey and Weak storey. Explain the codal provisions in case of a building with soft storey.	**10**	**L3**	**CO3**
	b.	Explain the concept of Plan irregularities and Vertical irregularities with neat sketches.	**10**	**L1**	**CO3**
		OR			
Q.6	**a.**	Briefly explain failure modes on Masonry structures.	**10**	**L2**	**CO3**
	b.	Explain Failure, Mechanism of infilled walls with the relevant sketches.	**10**	**L2**	**CO3**
		Module – 4			
Q.7	**a.**	What is Ductility? Discuss the factors affecting ductility in RCC building.	**10**	**L1**	**CO4**
	b.	Explain in detail, with sketches, the ductile detailing provisions for beam as per IS13920.	**10**	**L3**	**CO4**
		OR			
Q.8	**a.**	What are the different load combinations used in Earthquake analysis?	**6**	**L1**	**CO4**
	b.	Explain Special confining and Reinforcement in RCC members.	**8**	**L1**	**CO4**
	c.	Write a short note on Shear wall.	**6**	**L3**	**CO4**
		Module – 5			
Q.9	**a.**	Explain Methodology for Seismic retrofitting of RC building.	**10**	**L1**	**CO5**
	b.	Explain the procedure for Seismic Evaluation of structures.	**10**	**L2**	**CO5**
		OR			
Q.10	**a.**	Explain Qualitative and Analytical method of Seismic Evaluation.	**12**	**L2**	**CO5**
	b.	Explain Seismic response control concepts.	**8**	**L2**	**CO5**

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