U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

May / June 2025 Semester End Main Examinations

Programme: B.E. **Semester: VIII**

Branch: Civil Engineering **Duration: 3 hrs.**

Course Code: 22CV8PEERD **Max Marks: 100**

Course: Earthquake Resistant Design of Structures

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.
3. Use of IS 1893(2016) is permitted.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		Elaborate Reid's elastic rebound theory and plate tectonic theory with neat sketches	*CO1*	*PO1*	**10**
	b)		Discuss the quantification of earthquake based on the seismic scale.	*CO1*	*PO1*	**10**
			OR			
2	a)		Explain the working of seismometer and accelerometer.	*CO1*	*PO1*	**10**
	b)		Elaborate on origin and propagation of seismic waves with sketches.	*CO1*	*PO1*	**10**
			UNIT - II			
3	a)		Differentiate between response history and response spectrum methods.	*CO2*	*PO1*	**10**
	b)		Differentiate between elastic and elastoplastic response spectra. Illustrate their significance in understanding structural behavior during earthquakes.	*CO2*	*PO1*	**10**
			OR			
4	a)		Explain the factors affecting the seismic response of buildings and structures. How do site conditions influence the seismic performance of structures?	*CO2*	*PO1*	**10**
	b)		Define a tripartite plot. Explain key parameters used to represent seismic response characteristics.	*CO2*	*PO1*	**10**
			UNIT - III			
5			Calculate the base shear and storey forces for a four-storeyed Ordinary Moment Resisting Frame (OMRF) Television station building with more than 200 occupants is located in Seismic Zone II on medium soil. The structure has the following data:	*CO3*	*PO3*	**20**

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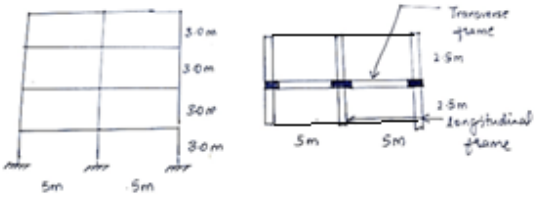
			• Height of each storey = 3.0 m • Damping = 5% • Self-weight of each floor = 1680.2 kN • Self-weight of roof = 1209.6 kN • Live load on each floor = 2.89 kN/m² • Live load on roof = 1.20 kN/m² • Plinth plan dimensions: 18 m × 9 m			
			OR			
	6		A four storied RCC ordinary moment resisting frame conforming to ductile detailing provisions residential building with occupancy less than 200 is as shown in fig the height of each storey is 3.0 m. Determine the response of the structure by equivalent static procedure. Take live load as 3.5kN/m^2. The columns are of size 250mmX450mm, the beams are 250mmX400mm and the slabs are 150 mm thick. Consider 250mm thick brick masonry walls along x-direction and 150mm thick brick masonry walls along y-direction. The type of soil is medium stiff. The location is Mysore. Neglect the effect of stiffness due to masonry infill 	*CO3*	*PO3*	**20**
			UNIT - IV			
	7	a)	Explain plan irregularities affecting the performance of the buildings during earthquakes.	*CO3*	*PO1*	**10**
		b)	Explain different lateral load resisting structural systems in building with neat sketches.	*CO3*	*PO1*	**10**
			OR			
	8	a)	Explain Ductility and the factors affecting ductility in the earthquake resistant design of structures.	*CO3*	*PO1*	**10**
		b)	Discuss the effect of masonry infill walls in the seismic analysis of RCC structures.	*CO3*	*PO1*	**10**
			UNIT - V			
	9	a)	Explain the different materials used for masonry construction.	*CO4*	*PO1*	**8**
		b)	Discuss the failure pattern of masonry building subjected to earthquake forces.	*CO4*	*PO1*	**12**
			OR			
	10	a)	Explain the elastic properties of masonry assemblage with sketches.	*CO4*	*PO1*	**10**
		b)	Recommend various earthquake resistant features that can be introduced in masonry for improving their performance during earthquakes.	*CO4*	*PO1*	**10**

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