Code No: H8702/R13

M. Tech. II Semester Regular/ Supplementary Examinations, July-2016

EARTHQUAKE RESISTANT DESIGN

(Common to SE and SD)

Time: 3 Hours **Max. Marks: 60**

Answer any FIVE Questions
All Questions Carry Equal Marks

1. a Distinguish between earthquake magnitude and intensity and also explain the various types of earthquake magnitude scale. 6
   b Explain the seismic zoning of India from the beginning and also explain its significance. 6

2. a Explain the behavior various lateral load resisting elements during an earthquake. 6
   b Explain the various types of roof diaphragms. 6

3. The plan of a four storeyed RC framed television station building with brick infill to be constructed in Delhi is shown in Fig. 1. The height between floors is 4 m. The soil below the foundation is assumed to be medium soil. Dead load on roof is 4 kN/m^2 and on the floor 3 kN/m^2. The live load on roof is 3 kN/m^2 and 4.5 kN/m^2 on floor. Determine the design seismic load on various frames of the building. 12

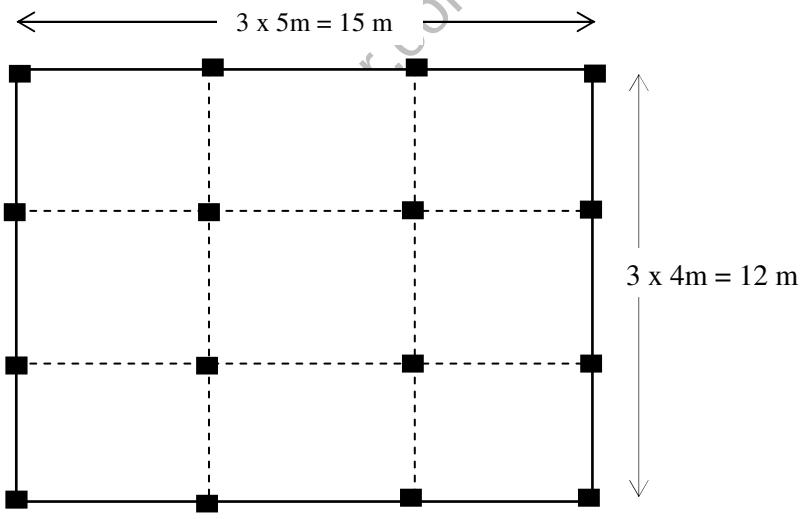

Fig. 1

4. a Explain the importance of ductility in earthquake resistant structures and describe the different types of ductility. 6
   b Draw the ductile detailing provisions of a beams and columns in reinforced concrete buildings. 6

5. a Explain the behavior of various elements of a steel structure under cyclic loading. 6
   b Explain the various conditions suitable for installation of a seismic isolation system. 6

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6. a Explain the factors influencing the damage of building during earthquake. 4
   b Explain the different method of seismic retrofitting of various components of reinforced concrete structures. 8

7. Design a shear wall of width 4 m and thickness 230 mm subjected to the following forces: 12

Type of Load	Axial Force (kN)	Moment (kNm)	Shear Force (kN)
Dead Load and Live Load	1600	500	30
Seismic Load	250	4000	650

Use M25 grade of concrete and Fe 415 steel.

8. Explain the following:
   a Effect of Local site conditions on the behavior of structures during an earthquake 4
   b Architectural considerations for the effective seismic design 4
   c Strong column and weak beam concept 4

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