M. Tech - Structural Engineering & Construction Sem. III

Design of Earthquake resisting RC Structures

P. Pages : 1 **GUG/W/16/4001**

Time : Four hours * 3 6 4 5 * Max. Marks : 70

Notes : 1. All questions carry equal marks.
2. Answer **any five** questions.
3. Illustrate your answers wherever necessary with the help of neat sketches.
4. I.S.I. Hand Book for structural steel section, I.S. Code 8000/1962 or 1964, I.S. 456 (Revised), I.S. 875 may be consulted 1893.2002, I.S. 13920

1. Explain the calculation of base shear the earthquake forces in response spectrum method. Assume suitable data wherever required. **14**

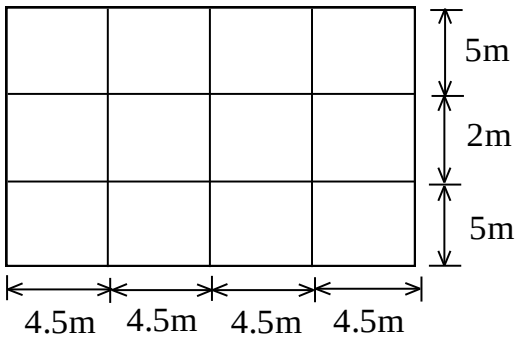
2. a) Explain with neat sketch the effect of torsion on multi storey buildings. **7**

b) Explain the soil structure interaction. **7**

3. Design a RC Beam column rigid joint for V = 250 KN, M = 350 KN.m and P = 120 KN in beam. Use M25 concrete and Fe 415 steel. **14**

4. Determine rotational ductility of RCC Beam 300 x 600mm (effective depth) reinforced with 2 No. of 16 mm bars at top and 4 Nos. of 20 mm bars at bottom. The grade of concrete is M20 and Fe 415 steel. **14**

5. Design a shear wall for a 10 storey building with plan as shown in fig. Assume that the shear walls will be design for 75% of the total base shear in both the directions. Sketch the reinforcement details. Consider height of each storey 3m and seismic mass $1\,T/M^2$ Building situated in seismic zone IV on medium soil. **14**



Que. No. 5

6. Write short notes on : **14**
i) Lateral stability of frames.
ii) Sway and overturning of frames.

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