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B.Tech. VII Semester (Main/Back) Examination - 2013
Civil Engg.
7CE6.1 Earthquake Resistant Design & Construction

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting **one** question from each **unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)*

Use of following supporting material is permitted during examination.

1. IS:1893 (Part-I)

Unit - I

1. Describe the plate tectonic theory of earthquake occurrence. Name the seven major tectonic plates & discuss the earthquake occurrence with reference to Indian continent. (8+3+5)

OR

1. Differentiate between the following:
 - a) Epicentre and hypocentre
 - b) Shallow earthquake and Deep earth quake.
 - c) P-waves and S-waves.
 - d) magnitude and intensity of earth quake. (4×4)

Unit - II

2. With the help of neat schematic diagrams describe the typical seismic behaviour of unreinforced masonry buildings. (16)

OR

2. Differentiate between the following:

- a) Seismogram and Seismograph.
- b) Structural and non structural members of building.
- c) Natural period of vibration and damping of building.
- d) In-plane and out-of-plane failure of masonry walls. (4×4)

Unit - III

3. Discuss the importance of following for masonry construction in earthquake prone area.

- a) Plinth band and lintel band.
- b) Integrity of various components of building. (2×8)

OR

3. "Regular and symmetrical plan and elevation of a building are preferred for earthquake resistant construction" Why? Explain in detail. (16)

Unit - IV

4. Describe the importance of following in R.C. construction.

- a) Weak beam and strong column analogy. *
- b) Ductile detailing. (2×8)

OR

4. Describe the following terms with reference to R.C. structures.

- a) Soft storey
- b) Shear walls
- c) Short column effect.
- d) Stiffness irregularity. (4×4)

Unit - V

5. a) Describe the salient features of seismic design philosophy. (6)

b) Differentiate between the following:

- i. Response reduction factor and importance factor.
- ii. Static analysis and dynamic analysis. (2×5)

OR

5. For a three storey symmetrical school building, determine the total base shear and lateral load on each floor level. If

- i) building type: Reinforced concrete framed structure.
- ii) Location: Bhuj (gujarat)
- iii) Foundation : on hard rock
- iv) Damping : 5 %
- v) Plan dimension : 7m
- vi) Story height : 3.5m
- vii) Weight of terrace floor : 155 kN
- viii) Weight on each storey includes the following:

Weight of beam in each storey : 130kN

Weight of slab in each storey : 250kN

Weight of columns in each storey : 50kN

Weight of walls in each storey : 530kN

Live load : 130kN

Use seismic coefficient method as per IS : 1893 (Part - I)

(16)