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7E4036

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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)**