

May 2024

B.Tech. (Civil) VI Semester

Earthquake Resistance Structure (PEC-CED-304-3)

Time : 3 Hours]

[Max. Marks : 75

*Instructions :*

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

**PART-A**

1. (a) Define Epicenter. (1.5)
- (b) Elaborate the concept of Lique faction. (1.5)
- (c) What is pre-stressed concrete? Elaborate. (1.5)
- (d) Define Torsion. (1.5)
- (e) What are shear walls? Elaborate. (1.5)
- (f) What is Base Isolation? Elaborate. (1.5)
- (g) What is a soft storey in construction? (1.5)
- (h) What is Braced Frame? Elaborate. (1.5)
- (i) What is cyclical loading? Elaborate. (1.5)
- (j) What is a design response spectrum? (1.5)

**PART-B**

2. (a) Explain following terms :
- (a) Base shear.
  - (b) Seismograph.
  - (c) Confinement Reinforcement.
  - (d) Irregular Buildings. (10)
- (b) Enlist various irregularities found in civil engineering structures from earthquake point of view. (5)
3. Discuss the following :
- (a) Response factors.
  - (b) Resonance.
  - (c) Damping.
  - (d) Grouting.
  - (e) Stiffness. (15)
4. Define and discuss how to increase the following for a building in an earthquake prone area :
- (a) Period of Vibration.
  - (b) Energy Dissipation capacity.
  - (c) Ductility. (15)
5. (a) What is meant by over clamped, critically damped and under damped system? (5)
- (b) Describe the theory of plate tectonics and also four major scientific developments by the theory. (10)

6. Discuss the following :
- (a) Isolating Devices.
  - (b) Construction materials properties for earthquake resistance.
  - (c) Static DOF and Dynamic DOF. (15)
7. Differentiate between :
- (a) Magnitude & Intensity.
  - (b) P wave and S wave.
  - (c) Hypocenter and Epicenter.
  - (d) Inter-plate Earthquake and Intra-plate Earthquake. (15)