

**End Semester Examinations - 2015-16 Even Semester - May 2016**

**14CE3007 Seismic Design of Structures**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

1. a) Explain briefly Elastic Rebound Theory. (10)  
b) Explain the Conceptual design considerations of earthquake resistant structural system. (10)

**OR**

2. a) Write Short notes on (i) Cause of Earthquake. (ii) Plate Tectonic Theory. (5+5)  
b) Briefly explain Earthquake design methodology. (10)

3. Compute the base shear of building frame situated in Coimbatore for the following data

Also distribute the base shear along the height of the frame.

Size of the building 30X30 m

Total height of the building – 20m

Bay width in X-dir – 5m

Bay width in Y-dir – 5m

Bay height in Z-dir – 4m (height)

Thickness of slab – 150 mm and Floor finish –  $1\text{ kN/m}^2$ .

Live load -  $4\text{ kN/m}^2$ . (20)

**OR**

4. A 10 storey OMRF building is having 3m storey height. There are totally 25 columns ( each 5 in x direction in 5 rows and 5 in y direction in 5 columns). Each columns is spaced at 6m apart. The dead load per unit area of the floor is  $4\text{ kN/m}^2$ . The intensity of live load is  $3\text{ kN/m}^2$  and on the roof is  $1.5\text{ kN/m}^2$ . The soil below the foundation is hard and the building is located in Delhi. Determine the seismic forces and shear at different floor levels. (20)

5. a) Compare different types of seismic analysis methods. (10)  
b) Write the Seismic analysis and design procedure for RCC building frame situated in Coimbatore zone. (10)

**OR**

6. Design a shear wall of length 4.8m and thickness 230mm subjected to the following forces. Assume  $f_{ck}=25\text{ N/mm}^2$ ,  $f_y=415\text{ N/mm}^2$  (20)

Loading	Axial force (kN)	Moment (kN-m)	Shear (kN)
DL+LL	2000	700	25
Seismic Load	200	5000	720

7. a) Discuss the behaviour of the following masonry walls in seismic regions. (i) reinforced masonry walls (ii)

infill walls. (5+5)

b) Write short notes on the following:

(i) Buckling of reinforcing bars

(3)

(ii) Effect of transverse reinforcement

(3)

(iii) Bond between reinforcing bars and concrete

(4)

**OR**

8. a) Write the seismic design considerations of masonry building. (10)
- b) Compare the behaviour of reinforced and unreinforced masonry subjected to seismic loading. Also discuss about the necessary reinforcements to be provided for masonry structures with neat sketches. (10)

9. Explain the concepts of pushover analysis with detailed procedure. (20)

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**Wishing you All the Best**

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