Reg. No. :

Question Paper Code: 12064

M.E. DEGREE EXAMINATION, OCTOBER 2014.

First Semester

Structural Engineering

01PSE103 – EARTHQUAKE RESISTANT DESIGN OF STRUCTURES

(Regulation 2013)

(Relevant codes are permitted)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Define Microzonation.

2. What are the different seismic zones in India as per IS 1893-2002?

3. What is Response Spectrum?

4. Write down the equation of motion for MDOF System.

5. Explain the type of bands required to be provided for earthquake resistance of Masonry Structures.

6. Explain the inter storey drift limitations as per IS 1893-2002.

7. Define shear wall

8. Write down the expression for distributing the lateral force along the height of the building.

9. What is capacity based design?

10. How to control the response of multistory building due to earthquake?

PART - B (5 x 14 = 70 Marks)

11. (a) Explain briefly the seismo-tectonics and seismic zoning of India.   (14)

Or

(b) Explain the characteristics of strong Earthquake motion.   (14)

12. (a) Explain briefly the concept of response spectrum and design response spectrum with neat sketches.   (14)

Or

(b) Explain the lessons learnt from past Earthquake. Discuss any two case studies.   (14)

13. (a) Describe briefly the plan, vertical, stiffness and mass irregularities as per IS 1893-2002 with neat sketches.   (14)

Or

(b) Discuss the guidelines for the Earthquake resistant design of masonry buildings.   (14)

14. (a) Explain the detailed design procedure for the design of RCC Shear wall according to IS 13920-1993.   (14)

Or

(b) A three storied symmetrical RC school building, situated at chennai with the following data

Plan dimensions	7m x 7m
Storey height	3.5 m
Total weight of beams in a storey	130 kN
Total weight of slab in a storey	250 kN
Total weight of column in a storey	50 kN
Total weight of walls in a storey	530 kN
Live load	130 kN
Weight of Terrace floor	655 kN

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The structure is resting on hard rock. Determine the total base shear and lateral loads at each floor level for 5% damping using Equivalent lateral load approach. (14)

15. (a) Explain in detail the realistic mathematic modeling of RCC building. The discussion should focus on the modeling of masonry infill, rigid floor diaphragm and soil structure interaction. (14)

Or

(b) Explain briefly the principle and application of

(i) Tuned mass dampers (6)

(ii) Base Isolation techniques with some real examples. (8)

PART - C (1 x 10 = 10 Marks)

16. (a) Explain the various steps involved in the analysis and design of a RCC multistoried building as per IS 1893-2002. (10)

Or

(b) Explain the ductile detailing requirement for beams and columns as per IS 13920-1993. (10)

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