M.E. DEGREE EXAMINATIONS: JUNE 2011

Second Semester

STRUCTURAL ENGINEERING

SEE508: Aseismic Design of Structures

Time: Three Hours   **Maximum Marks: 100**

Answer all questions:-

PART A (10 x 2 = 10 Marks)

1. What are the types of dynamic loads? Give examples.

2. What is logarithmic decrement? Give expression for the same.

3. Define damping. What are its types?

4. Define forced and free vibration.

5. List the factors that increase ductility in RC structures with seismic loading.

6. What is capacity design?

7. List the dynamic soil properties.

8. What is Zone factor?

9. What are the advantages of a Passive energy Dissipation system?

10. What are the elements of detailed drawing for R.C members?

PART B (5 x 16 = 80 Marks)

11. a) (i) Explain the Elastic rebound Theory with a neat sketch.   (6)

    (ii) Explain the various seismic waves in detail with neat sketches.   (10)

(OR)

  b) (i) Differentiate Magnitude and Intensity of earthquake.   (6)

    (ii) Explain the measures in mitigating effects of earthquake in RC structures.   (10)

12. a) Derive the equation of motion of a single degree of freedom system with damping under

    free vibration and hence find the solution for,

        (i) Under damped system

        (ii) Critically damped system

        (iii) Over damped system

(OR)

b) (i) Explain the concept of response spectrum. (10)

(ii) List the factors influencing the response spectrum. (6)

13. a) Explain the various types of shear wall with neat sketches. Write the step by step procedure for the design of Reinforced Concrete Shear wall.

(OR)

b) Explain with neat sketches how ductility can be improved in Flexural and Compressive structures as per IS: 13920?

14. a) Explain how to improve the seismic behaviour of masonry structures.

(OR)

b) A four storied residential building is situated at Chennai, having 4 bays at 4 m centres in X-direction and 5 bays at 5 m centres in Y-direction. Total height of the building is 15 m. (4.5 m at the base and 3.5 m each for other stories). The building is supported on raft foundation resting on hard soil. The frame is made of RC and infilled with brick masonry. The weight due to all dead loads is 12 kN/m^2 on floors and 6 kN/m^2 on the roof. The floors are to cater for live load of 3 kN/m^2 on floors and 1.5 kN/m^2 on the roof. Determine the design seismic load on the structure.

15. a) (i) Explain Base Isolation systems and their suitability. (10)

(ii) List the various structural arrangements to improve the behavior of a multistoried building under seismic loads. (6)

(OR)

b) (i) Explain with neat sketches the various energy dissipation systems. (10)

(ii) Illustrate the requirements of post processor of any software package to study the behaviour of concrete and steel structures. (6)

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