Reg. No. :

R 3179

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Seventh Semester

(Regulation 2004)

Civil Engineering

CE 1403 — BASICS OF DYNAMICS AND ASEISMIC DESIGN

(Common to B.E. (Part-Time) Sixth Semester Regulation 2005)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Distinguish between static and dynamic loading.

2. What is logarithmic decrement?

3. How frequency is affected in the free vibration of a shear frame?

4. What is model analysis?

5. What is the difference between epicentre and hypocentre?

6. Compare 'intensity' and 'magnitude' of an earthquake.

7. What is liquefaction?

8. List any two factors that increase ductility in RC structures with seismic loading.

9. What are the two design philosophies in the earthquake resistant structural design?

10. List any four isolation devices.

PART B — (5 × 16 = 80 marks)

11. (a) A weight attached to a spring of shiffness 530 N/m undergoes viscous damping when the weight was displaced and released. The period of vibration was found to be 1.8 seconds. The ratio of consequetive amplitudes was found to be 4.2/1.0. Determine the amplitude and phase angle when a force of 200 cos 3t N acts on the system.

Or

13. (a) Describe briefly the tectonic plate theory.

Or

(b) Explain the following :
   (i) Seismic waves
   (ii) Principle of seismograph
   (iii) Characteristics of string ground motion.   (6 + 5 + 5)

14. (a) Discuss briefly about the Response spectrum and design spectrum.

Or

(b) (i) Discuss the dynamic soil properties needed in the analysis and design of a structure subjected to seismic loads.
   (ii) List the requirements and analysis for soil susceptible to liquefaction.   (12 + 4)

15. (a) (i) Discuss briefly the various codal provisions for the dynamic analysis of a building.   (10)

   (ii) A four storied single bay building frame is of reinforced concrete situated in zone IV. The height between floors is 3 m. Total height of the building is 12 m. The dead and line loads are lumped at the respective floor levels. The soil below the foundation is hard rock. It is a hospital building. Determine the total base shear and the equivalent lateral loads at various floor levels, using the emphirical method of IS 1893 – 2002 (Part I).

   Stiffness of each column in I, II, III, and IV floors are 500 kN/m 400 kN/m, 300 kN/m and 300 kN/m respectively.

   The seismic weight of I, II, III and IV floors are 80 kN, 80 kN, 40 kN and 40 kN respectively.   (6)

Or

(b) Explain briefly the various base isolation techniques.

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