Reg. No. : | | | | | | | | | | | | | |

Question Paper Code : 73265

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Seventh Semester

Civil Engineering

CE 2403/CE 73/10111 CE 703 — BASICS OF DYNAMICS AND ASEISMIC DESIGN

(Regulations 2008/2010)

(Common to PTCE 2403/10111 CE 703- Basics of Dynamics and Aseismic Design for B.E. (Part-Time) Fifth/Seventh Semester - Civil Engineering - Regulations 2009/2010)

Time : Three hours Maximum : 100 marks

Use of IS 1893— 2002/IS 13920 —1993 (Reaffirmed 1999) and IS 4326— 1993 is permitted)

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Explain Frequency Ratio.

2. Explain Critical Damping.

3. Write any two assumptions that are made in the idealization of a shear building.

4. Enumerate orthogonality and normality principles.

5. What is the difference between intensity and magnitude of earthquake?

6. What is Modified Mercalli scale?

7. What is meant by liquefaction of soil?

8. What is meant by zero period acceleration?

9. How to reduce the earthquake effects on building?

10. What is shear flexure failure?

PART B — (5 × 16 = 80 marks)

11. (a) Derive the equation of motion of a single degree of freedom system for free vibration and find the solution for

(i) under damped system and (8)

(ii) over damped system (8)

Or

(b) A simple Supported rectangular beam has a span of 1 m. It is 100 mm wide and 10 mm deep. It is connected at mid-span of a beam by means of a linear spring having a stiffness of 100 kg/cm and a mass of 300 kg is attached at the other end of spring. Determine the natural frequency of the system Take $E = 2.1 \times 10^6$ kg/cm^2. (16)

12. (a) Determine the natural frequencies and nodes of the system shown in Fig. Q 12 (a).

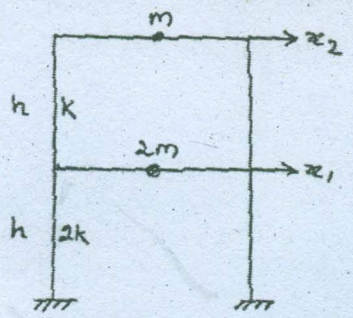

Fig. Q 12 (a).

Or

(b) Determine the natural frequencies and modes of the system show in Figure. Q.12(b)

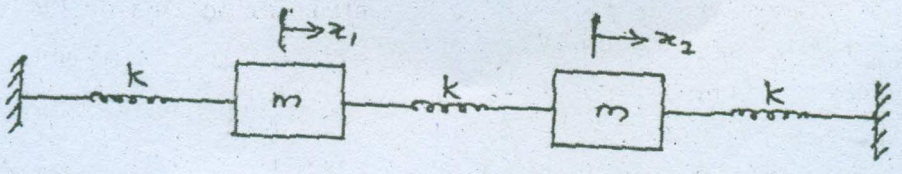

Figure. Q.12(b)

13. (a) (i) Explain the plate tectonics theory (8)

(ii) Explain the body waves and surface waves with neat sketch. (8)

Or

(b) (i) Explain the seismograph with neat sketch. (8)

(ii) Explain the characteristics of strong ground motions with neat sketch. (8)

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

Or

(b) Define liquefaction. What are the factors that affect liquefaction? What are the measures taken to reduce the possibility of liquefaction?

15. (a) What is the effect of ignoring the contribution of masonry infill in the lateral load analysis of a multi-storey frame?

Or

(b) In what manner is the behavior of a soft storey construction likely to be different from a regular construction in the event of an earthquake?
