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

Question Paper Code : 71593

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

Seventh Semester

Civil Engineering

CE 6701 — STRUCTURAL DYNAMICS AND EARTHQUAKE ENGINEERING

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Describe D-Alembert's principle.
2. Classify the types of vibration.
3. What is fundamental frequency and fundamental mode?
4. Define Eigen vectors.
5. Define focus and epicenter.
6. Explain modified Mercalli intensity scale.
7. Explain the term Response reduction factor.
8. Write note on Bouchinger effect.
9. Write a short note on curvature ductility.
10. Write the formula for modal mass.

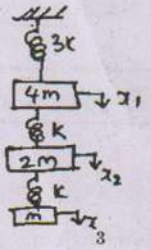
PART B — (5 × 16 = 80 marks)

11. (a) A vibrating system Consists of a mass of 5 kg, spring of stiffness 120 N/m and a damper with a damping co-efficient of 5 N-s/m. Calculate Damping factor, Natural frequency of the system, Logarithmic decrement, the ratio of two successive amplitude the number of cycles after which the initial amplitude reduces to 25%. (16)

Or

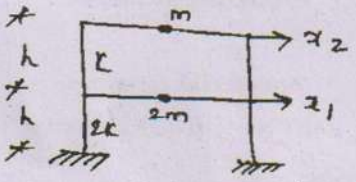
(b) Examine whether the log–decrement is also given by $\delta = 1/n \log(U_0 / U_n)$ represents the amplitude after n cycles have elapsed. (16)

12. (a) Analyze the natural frequency and mode of the system. (16)



Or

(b) Solve the natural frequency and mode of vibration of the system. (16)



13. (a) (i) Explain the seismic waves with neat sketch. (10)

(ii) Discuss about the elastic rebound theory. (6)

Or

(b) Describe about the characteristics of strong ground motion with neat graph. (16)

14. (a) Write the step by step procedure for seismic analysis of RC buildings as per IS 1893:2002. (16)

Or

(b) List out the lessons learnt from the past earthquakes in India and explain it briefly. (16)

15. (a) Explain about the Earthquake design philosophy for masonry and RCC buildings. (16)

Or

(b) (i) Explain in detail about lateral load analysis. (6)

(ii) Explain in detail about detailing as per IS 13920 – 1993. (10)