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Question Paper Code : 42264

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018

Seventh Semester

Civil Engineering

CE 2403 – BASICS OF DYNAMICS AND ASEISMIC DESIGN

(Regulations 2008)

(Common to PTCE 2403 – Basics of Dynamics and Aseismic Design for
BE (Part-Time) Seventh Semester-Civil Engineering-Regulations 2009)

Time : Three Hours

Maximum : 100 Marks

IS 1893, IS 13920, IS 456, IS 4326 codes are permitted.

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. Define the term degree of freedom.
2. State the D'Alembert Principle.
3. What is meant by shear building ?
4. What is meant by mode shape ?
5. Differentiate magnitude and intensity of an earthquake.
6. What is meant by focus ?
7. Define the term response spectra.
8. What is meant by ductility ratio ?
9. Write the concept of base isolation.
10. How will you get seismic weight of a floor ?

PART – B

(5×16=80 Marks)

11. a) An SDOF system is subjected to free vibration with an initial velocity V_0 without any initial displacement. Determine the subsequent motion of the system for the two damping ratios. $\rho = 2.5$, $\rho = 1.0$. (16)

(OR)



- b) A mass of one kg is suspended by a spring having a stiffness of 600 N/m. The mass is displaced downward from its equilibrium position by a distance of 0.01 m. Determine the following :

- a) Equation of motion of the system, b) Natural frequency of the system, c) The response of the system as a function of time, d) Total energy of the system. (16)

12. a) Determine the natural frequencies and mode shape of the system shown in fig. (1) (16)

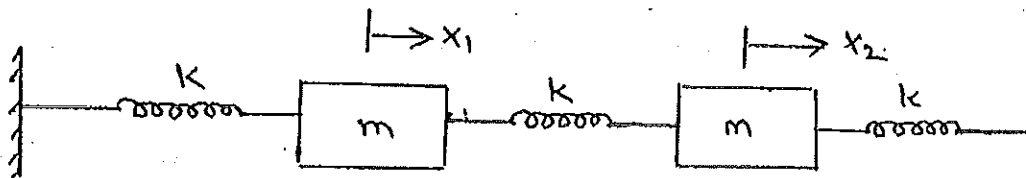


Fig (1)

(OR)

- b) Discuss in detail about concept of mode superposition and decoupling of equations. (16)

13. a) Discuss in detail about the seismic waves. (16)

(OR)

- b) List out the various causes of earthquake and explain briefly about elastic rebound theory. (16)

14. a) i) List out and explain the effects of liquefaction of soil. (8)

- ii) Explain briefly about design spectra. (8)

(OR)

- b) Discuss in detail about the importance of Ductility in Earthquake Resistant design and list out the various methods of introducing Ductility in to RC Structures. (16)

15. a) With neat sketches, discuss briefly about various ductile detailing provisions of R.C. elements given in IS 13920. (16)

(OR)

- b) Explain briefly about the base isolation techniques and vibration control measures. (16)