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Question Paper Code : 31217

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Seventh Semester

Civil Engineering

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

(Common to PTCE 2403 – Basics of Dynamics and Aseismic Design for B.E.
(Part – Time) Fifth Semester Civil Engineering-Regulation –2009)

(Regulation 2008/2010)

Time : Three hours

Maximum : 100 marks

Use of IS 1893–2002 is permitted

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Distinguish between Free and Forced vibration.
2. What are the various types of dynamic loads?
3. State D'Alembert's Principle.
4. What is meant by Degree of Freedom of a Dynamic System?
5. What is the difference between intensity and magnitude of earthquake?
6. What is Modified Mercalli scale?
7. What is called ductility factor?
8. Define 'Response Spectrum' of an earthquake.
9. What is the main function of base isolators?
10. What is meant by energy dissipation capacity?

PART B — (5 × 16 = 80 marks)

11. (a) Derive the equation of motion of single degree of freedom for free vibration to find out the natural frequency and angular frequency.

Or

- (b) Define and discuss the following:

- (i) Critical damping (8)
- (ii) Damped circular frequency (8)

12. (a) Explain with neat examples of Multi-Degree-of-Freedom systems.

Or

(b) Derive the orthogonality relation between the modal shapes of a two degrees of freedom.

13. (a) Write in detail about Seismograph with neat schematic diagram and their classifications.

Or

(b) Explain the plate tectonics theory and its mechanism.

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) Write in brief on the design philosophy and methodology of earthquake resistant design.

Or

(b) Discuss seismic active control methods and its concepts.
