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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.

 $PART A - (10 \times 2 = 20 \text{ marks})$ 

- L. 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 — 
$$(5 \times 16 = 80 \text{ marks})$$

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.