Reg. No.

Question Paper Code : 51265

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

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.   Define critical damping.

2.   What is meant by negative damping ?

3.   Brief on the modal super position method.

4.   What is the fundamental frequency and fundamental mode ?

5.   What is elastic rebound theory ?

6.   What is the difference between magnitude and intensity of earthquakes ?

7.   What is called ductility factor ?

8.   Define 'Response Spectrum' of an earthquake.

9.   What is the concept of base isolation ?

10. What do you mean by seismic dampers ?

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

    (ii)   Damped circular frequency

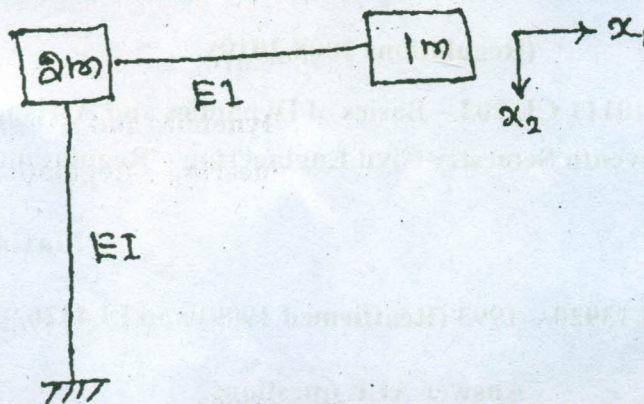12. (a) Determine the natural frequency and mode of vibration of the given system shown in fig. 12 (a).

Fig. 12 (a)

OR

(b) Determine the natural frequencies and the mode shapes for the shear building as shown in fig. 12 (b).
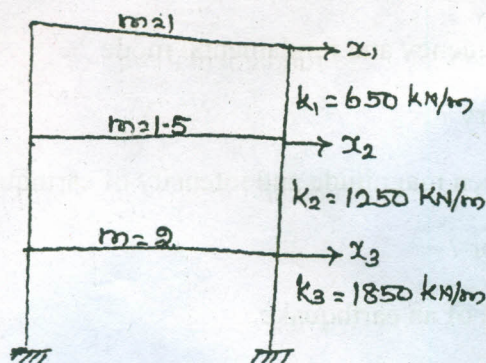

Fig. 12 (b)

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13. (a) (i) Elastic rebound theory - Explain in detail.

   (ii) Explain the types of fault with neat sketches,

   (iii) Write short notes on magnitude of earthquake.

OR

   (b) (i) Explain the types of earthquake.

   (ii) Explain the seismogram with neat sketch.

14. (a) Describe briefly the factor affecting liquefaction characteristics.

OR

   (b) Derive an expression for the condition which a structure will sink during earthquake.

15. (a) A three storeyed single bay building frame of a hospital building is of reinforced concrete. It is situated in zone IV. The height between floors is 3 m. The dead load and live loads are lumped at the respective floor levels. The structure is resisting on hard rock. Stiffness of each column in I, II and III floors are 400 kN/m, 300 kN/m and 300 kN/m respectively. The seismic weight of I, II and III floors are 80 kN, 40 kN and 40 kN respectively. Determine the total base shear and the equivalent lateral loads at various floor levels using the empirical method of IS 1893-2002 (Part I). **(16)**

OR

   (b) With neat sketches explain the different types of base isolation techniques. **(16)**

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