Total No. of Questions :8] *[Total No. of Printed Pages :2*

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CE-8041

B.E. VIII Semester

Examination, June 2017

Structural Dynamics and Earthquake Engg.

(Elective-II)

Time : Three Hours

Maximum Marks : 70

Note: i) Answer any five questions.
ii) All questions carry equal marks.

1. A vibrating system consisting of a weight of 50N and a spring of stiffness 2000 N/m is viscously damped. The ratio of two consecutive amplitudes is 1.0 to 0.8.
Determine :
i) the natural frequency of the undamped system,
ii) the logarithmic decrement,
iii) the damping ratio,
iv) the damping coefficient and
v) the damped natural frequency.

2. Model the system shown in Fig. 1 by a block attached to a single spring of an equivalent stiffness. Also determine the natural frequency of vibration.

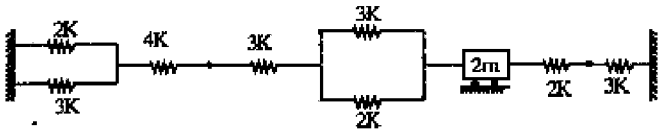

Figure 1

3. Discuss in detail the "Central Difference Method" for numerical solution of equation of motion of single degree of freedom system.

4. Write algorithm for step-by-step solution of a linear system using Newmark's method.

5. During an Earthquake, the maximum amplitude recorded at a site by Wood-Anderson Seismograph is 12 cm. The maximum ground velocity recorded was 20 cm/sec. The site was found to be 75km away from the epicentre. Determine the magnitude and intensity of the occured earthquake.

6. Discuss Response Spectrum for elastic and inelastic systems and its constructions.

7. Determine the natural frequencies of the vibrating system shown in Fig. 2

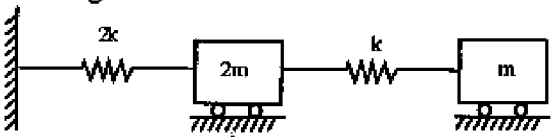

Figure 2

8. Answer any four of the following:
a) Discuss any one method for determining the damping coefficient.
b) Explain the method for numerical evaluation of Duhamel's integral for undamped system.
c) Explain magnitude of Earthquake and discuss various magnitude scales.
d) Explain in short "Model Superposition Method".
e) What do you mean by Hysteretic damping and its importance in Earthquake Resistant Design.
f) Explain the importance of Shear Walls in multistoryed buildings.

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