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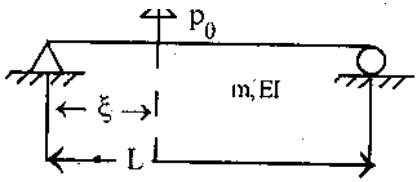

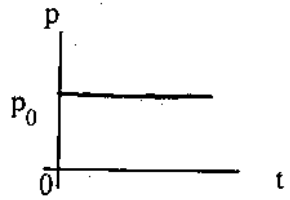

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9. Write a detailed note on ductile detailing.

Or

10. Write notes on the following:

a) Design of structures for ductility related to Earthquake Resistant Design.

b) Energy absorption in Earthquake Resistant Structures.

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Total No. of Questions : 10] *[Total No. of Printed Pages : 4*

Roll No .....

CE - 8041

B.E. VIII Semester

Examination, June 2015

Structural Dynamics and Earthquake Engineering

(Elective-II)

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt all Five questions.
ii) All questions carry equal marks.
iii) Assume suitable data if necessary and state them clearly.

1. a) Explain, Step, Ramp and pulse excitations.

b) A sensitive instrument with weight 45.3 kg is to be installed at a location where the vertical acceleration is 0.1 g at a frequency of 10Hz. This instrument is mounted on a rubber pad of stiffness 5.62 kg/cm^2 and damping such that the damping ratio for the system is 10%.

i) What acceleration is transmitted to the instrument?

ii) If the instrument can tolerate only an acceleration of 0.005 g, suggest a solution assuming that the same rubber pad is to be used. Provide numerical results.

Or

2. Derive an equation of motion for a single degree of freedom vibration with viscous damping due to a pulsating load "$F_0 \sin \omega t$" acting as the vibrating agent.

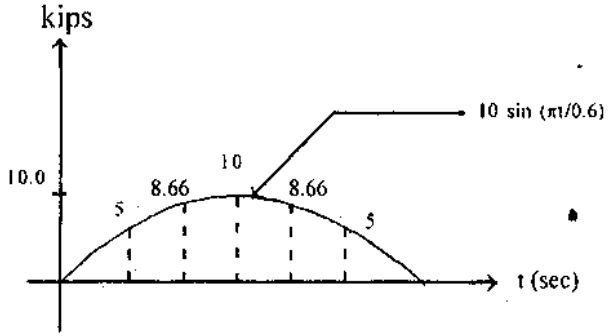
3. Discuss
   a) Time stepping methods.
   b) Analysis of Non-linear response.

Or

4. A SDF system has the following properties $m = 0.2533$ kip-sec^2/in, $k = 10$ kips/in.

   $T_n = 1$ sec ($w_n = 6.283$ rad/sec), and $\zeta = 0.05$.

   Determine the response $u(t)$ of this system to $p(t)$ defined by the half-cycle sine pulse force shown in figure by
   a) Using piecewise linear interpolation of $p(t)$ with $\Delta t = 0.1$ sec. and
   b) Evaluating the theoretical solution.

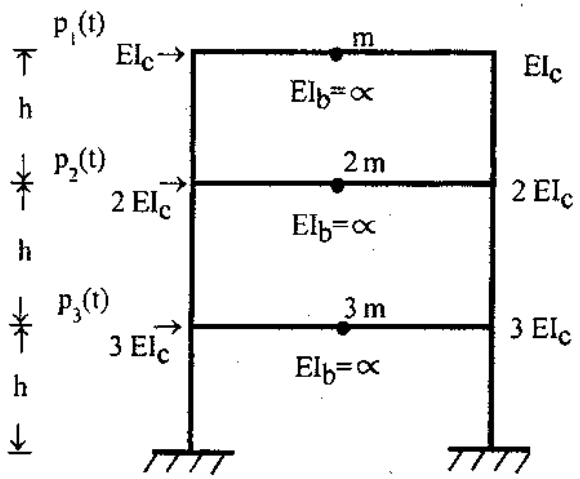


5. Explain in detail the following terms:
   a) Magnitude of earthquake.
   b) Intensity of earthquake.
   c) Epicenter of earthquake.
   d) Focus of earthquake.

Or

6. Discuss the following for Earthquake analysis and response of inelastic buildings.
   a) Equations of motion.
   b) P-D Effects.
   c) Modeling Assumptions.
   d) Statistical variation.

7. Formulate the equation of motion for the three - storey shear frame shown in figure.



Or

8. Derive mathematical expressions for the dynamic response - displacement and bending moments of a uniform simply supported beam to a step function force p_0 at distance ξ from the left end. Specialize the results for the force applied at midspan.