

PSES22 - Structural Dynamics

P. Pages : 1

Time : Three Hours

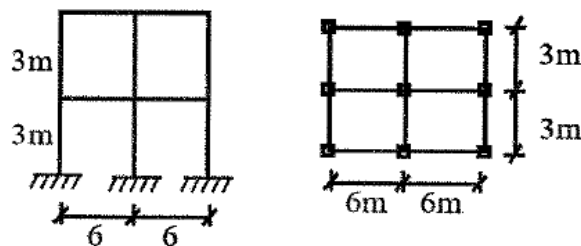


GUG/S/23/11014

Max. Marks : 70

- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Diagrams and Chemical equation should be given wherever necessary.
 5. Illustrate your answers wherever necessary with the help of neat sketches.
 6. Use of slide rule, Logarithmic tables, Steam tables, Mollier's chart, Drawing instruments, Thermodynamic tables for moist air, Psychrometric charts and Refrigeration charts is permitted. Non programmable Electronic Calculator is allowed.
 7. I.S. Hand Book for structural steel section, I.S. Code 8000/1962 or 1964, I.S. 456 (Revised), I.S. 875 may be consulted.
 8. Solve **any five** questions.

1. a) How equation of motion are formulated for earthquake motion leading to lateral displacement and rotation using simplification method. 7
 b) Derive the equation of motion for single DOF structures without damping. 7
2. A block of mass 0.1 kg is suspended from a spring having a stiffness of 25 N/m the block in displaced downwards from the equilibrium position through a distance of 2 cm and released with an upward velocity of 3 cm/sec. Determine: 14
 Natural frequency
 Periods of oscillation
 Maximum velocity
 Maximum Acceleration
 Phase angle
3. Describe in details Lagrange equation & its application. 14
4. Find the distribution of seismic forces at floor levels for RCC frame shown below in zone III. Spacing of frames is 3.0 m c/c. 14
 i) Slab thickness – 120 mm
 ii) All beams – 400 x 400 mm
 iii) All columns – 500 x 500 mm
 iv) LL on all floor – 2.0 KN/sqm



5. Explain in detail the free transverse vibration of continuous beam subjected to moving Live Load. 14
6. Explain Response of continuous systems to dynamic loads. 14
