

M.Tech. Structural Engineering & Construction CBCS Pattern Semester-II
PSES22 - Structural Dynamics

P. Pages : 1

Time : Three Hours



GUG/W/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. Illustrate your answers wherever necessary with the help of neat sketches.
 5. Solve **any five**.

1. a) What is damping? Discuss types of damping. 6
 b) The mass of a spring-mass dashpot system is given an initial velocity $5\omega_n$, where ω_n is the undamped natural frequency of the system. Find the equation of motion for the system, when (i) $\zeta = 2.0$, (ii) $\zeta = 1.0$, (iii) $\zeta = 0.2$. ($\zeta =$ damping ratio). 8
2. Explain the concept of mathematical model expressing mass, elasticity and damping for a SDOF System. 14
3. Calculate u and ω following parameters: 14
 $m_1 = 9$ kg, $m_2 = 1$ kg, $k_1 = 24$ N/m and $k_2 = 3$ N/m

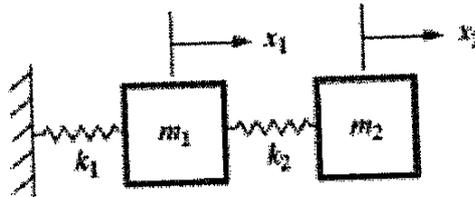


Figure 3

4. Find the distribution of seismic forces at floor levels for RCC frame shown below in zone IV. Spacing of frames is 4.00 m c/c. 14
 i) Slab thickness – 110 mm ii) All beams – 350 x 350 mm
 iii) All columns – 450 x 450 mm iv) LL on all floor – 2.5 kN/m²

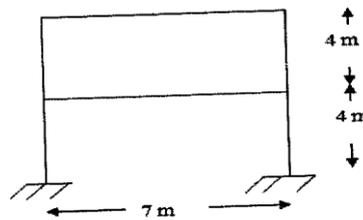


Figure 3

5. Explain the seismic procedure of elevated storage reservoir as per IS 1893-2016. 14
6. Explain Rayleigh Ritz method in details. Also explain response of continuous system to dynamic loading. 14
