

GANPAT UNIVERSITY**B. Tech. Semester: VII Civil Engineering****Regular Examination Nov – Dec 2015****2CI 708 Elective Subject – I (Design of Earthquake Resistant Structures – I)****Time: 3 Hours****Total Marks: 70**

- Instruction:**
1. All questions are compulsory.
 2. Figure Indicates right full marks.
 3. Assume suitable data wherever if necessary.
 4. Use of IS 1893-2002, IS 875-1975 (Part I,II,III) is allowed.

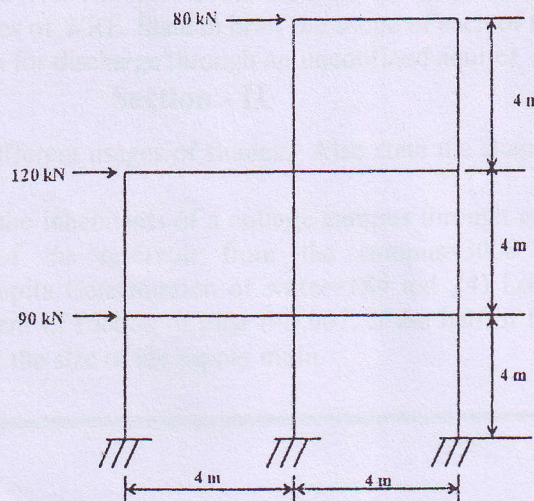
Section - I

- Que. – 1**
- (A) What is damping? Explain types of damping. 03
- (B) Derive the equation for the single degree of free-damped vibration system. 04
- (C) A spring mass model consists of 5kg mass and spring with stiffness 3.5N/mm was tested for viscous damped vibration. Test recorded two successive amplitudes 1.5 and 1.25. Determine: 05
- i. The natural frequency of undamped system.
 - ii. The logarithmic decrement
 - iii. Damping ratio
 - iv. Damping coefficient
 - v. Damped natural period

OR

- Que. – 1**
- (A) What is vibration? Explain different types of vibration with example. 03
- (B) Define mathematical model and its elements. Assumption made in Mathematical model. 04
- (C) A spring mass dashpot system consists of a spring of stiffness 343N/m. The mass is 3.43kg. The mass is displaced 2cm beyond the equilibrium position and release to vibrate. Find the equation of motion for the system, if the damping coefficient of the dashpot is equal to 13.72N.S/m. 05

- Que. – 2** Analyze the building frame shown in figure by Portal Method and also draw SFD, BMD and AFD. 12



- Que. – 3 (A) Explain Logarithmic Decrement. 03
 (B) Define Centre of Mass and Centre of Stiffness. 03
 (C) Explain the behavior of brick masonry wall during earthquake. 05

OR

- Que. – 3 (A) Differentiate between D'Alembert's Principal and Newton's second Law. 03
 (B) Enlist advantages and limitation of Portal method. 03
 (C) Write the short note on horizontal and vertical band in masonry structure. 05

Section – II

- Que. – 4 (A) Define following terminology: 06
 i. Focus ii. Epicenter
 iii. Focal Depth iv. Epicentral Distance
 v. Magnitude vi. Fundamental Natural Period
 (B) Explain the seismic waves in details. 06

OR

- Que. – 4 (A) What is fault? Explain various types of faults. 06
 (B) Explain the inertia force in building during earthquake. 06

- Que. – 5 (A) Write a short note on capacity design concept and strong column weak beam concept. 05
 (B) Explain with figure ductile detailing of beam as per IS:13920:1993 06

OR

- Que. – 5 (A) Write a short note on structural control system 05
 (B) Explain with figure ductile detailing of column as per IS:13920:1993 06

- Que. – 6 (A) What is liquefaction? Explain the factor affecting liquefaction. 06
 (B) Explain the prevention technique of liquefaction in details. 06

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