Student Exam No._____

GANPAT UNIVERSITY

B. Tech. Semester: 8th Civil Engineering

Regular Examination April – June 2015

2CI808 Elective Paper – II (Design of Earthquake Resistant Structures –II)

Time: 3 Hours **Total Marks: 70**

Note: 1. All Questions are Compulsory
2. Figure to the Right indicates full marks.
3. Use of code IS: 1893-2002 and IS: 875 (part-III)-1987 are allowed.

Section - I

Que. – 1 Analyse the building frame shown in figure 1 by portal method and draw SFD, BMD & AFD. **12**

OR

Que. – 1 Analyse the building frame shown in figure 1 by cantilever method and draw SFD, BMD & AFD. **12**

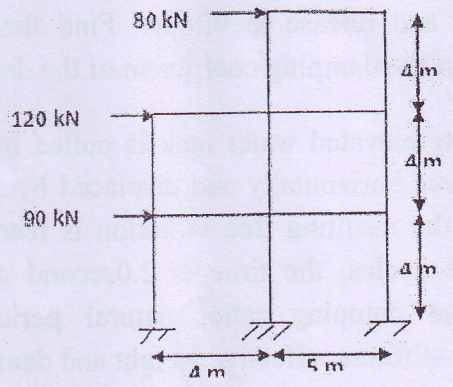

Figure 1

Que. – 2 (A) Explain tuned devices. **05**

(B) Types of base isolation device & its suitability with connection details. **06**

OR

Que. – 2 (A) What is Passive control device? Explain any one type of it. **05**

(B) Give your thought on EQ effects and its preventive measure which we have taken. **06**

Que. – 3 Calculate wind force and draw pressure diagram for a multistoried framed building which is located at Gandhinagar having following data. **12**

Physical parameters:

- Length : 35 m
- Width : 15 m
- Height : 35 m
- Height of each storey : 3.5m
- Spacing of frames along the length : 4.5 m

Wind data:

- Wind zone : 4
- Terrain category : 2
- Topography : Flat that is upwind slope < 3°
- Life of structure : 100 years.

Section – II

Que. – 4	(A)	Major defects in structural elements.	06
	(B)	Derive the equation for single degree freedom system for damped condition.	06
Que. – 5	(A)	A vibrating system consists of a mass 50 kg, a spring of stiffness 30kN/m and a viscous damper. For the following conditions, find the equation for displacement at any instant of time. Assume critically damped system. The initial displacement and velocity given as 5 cm and 0 m/s respectively and the system is released. Also, find the time taken by the mass to reach at 5 mm from equilibrium position on return after releasing the system.	07
	(B)	A mass spring system has a frequency of 2 Hz. When mass is decreased by 0.6 kg. The frequency is changed by 37%. Determine mass and spring constant.	05

OR

Que. – 5	(A)	A spring mass dashpot system consist of a spring of stiffness 343N/m. The mass is 3.43kg. The mass is displaced 0.02m 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 13.72Ns/m.	06
	(B)	An empty elevated water tank is pulled by a steel cable by applying a 30kN force horizontally and displaced by 50mm. The cable is suddenly cut and the resulting free vibration is recorded. At the end of the five complete cycles, the time is 2.0second and the amplitude is 0.02m. Determine damping ratio, natural period of undamped vibration, effective stiffness, effective weight and damping coefficient.	06
Que. – 6	(A)	Explain following term. (i) Ductility (ii) Durability (iii) Drift	06
	(B)	Goals and objective of Seismic Retrofit.	05

OR

Que. – 6	(A)	Explain following term. (i) Repair (ii) Retrofit (iii) Rehabilitation	06
	(B)	Explain the Need for Seismic Evaluation of Existing Building.	05

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