Sanjay Ghodawat University, Kolhapur

2020-21

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

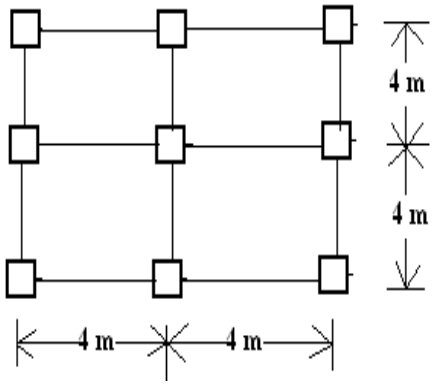
EXM/P/09/00

Year and Program: 2020-21	**School of Technology**	**Department: Civil**
Course Code: CET402	**Course Title: Earthquake Engineering**	**Semester : VII**
Day : Tuesday **Date : 22/12/2020**	**End Semester Examination**	**Time : 2 Hrs.** **Max Marks : 50**

Question Paper

Instructions: 1) All Questions are compulsory.
2) Assume any suitable data whenever necessary.
3) Use of non-programmable calculator and
4) IS 1893 - 2016 (Part I) and IS 13920 – 2016 are allowed.

		Marks	Bloom's Level	CO
Q.1	**Answer the following (any Two)**–			
a)	Explain the elements of seismology, magnitude and intensity of earthquake	8	4	CO1
b)	Show that the log – decrement is also given by the equation $\delta = {}^{1}/_{n} \log({}^{x_0}/_{x_n})$ where, x_n represents the amplitude after 'n' cycle have elapsed	8	4	CO2
c)	A SDOF vibrating system is having following parameters. m = 300 kg, k = 200 N/m, c = 80 N – sec / m. Determine (i) the damping factor (ii) the natural frequency of damped vibration (iii) logarithmic decrement (v) the number of cycles after which the original amplitude is reduced to 60%.	8	4	CO2
Q.2	**Answer the following (any two)** –			
a)	A simply supported beam of negligible mass spanning 5 m supports a machine of 100 kN at center with an unbalanced rotor applying a vertical force of $100\ sin\ 4\ t\ kN$. The damping force is 0.4 kN-s/m & Flexural rigidity of beam is 20000 kN-m^2. Determine (i) maximum amplitude of vibration (ii) amplitude of vibration at resonance	8	5	CO2
b)	The plane and elevation of a three-storied RCC school building is shown in the figure. The building is located in seismic zone V. The type of soil encountered is medium stiff and it is proposed to design the building with a special moment resisting frame. The intensity of load is 10 kN/m^2 and the floors are to cater to an imposed load of 3kN/m^2. Determine the base shear on the structure by equivalent static analysis. Storey height of each floor is 3.5 m.	8	5	CO3



c)	Determine the story level earthquake force on the structure by equivalent static analysis for above problem (2. b).	8	5	CO3

Q.3 **Answer the following (any two)** –

a)	Explain ductile detailing of column as per IS 13920	9	3	CO3
b)	Explain Friction Dampers and its mechanism?	9	3	CO4
c)	Explain Tuned Mass Dampers?	9	3	CO4

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