O.P.Code: 20CE1006	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech. I Year II Semester Regular & Supplementary Examinations July-2025
STRUCTURAL DYNAMICS
(Structural Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

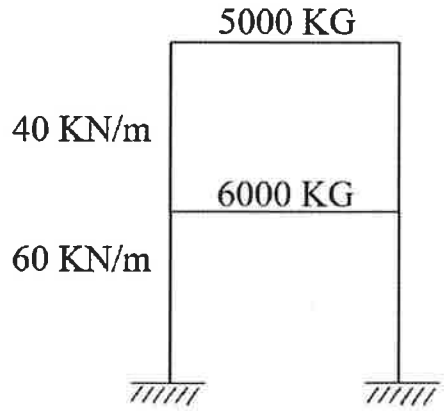
1		Define the following **i)**Degree of freedom system **ii)** Harmonic Excitation **iii)** Simple harmonic motion **iv)** D'Alemberts principle	**CO1**	**L2**	**12M**
		OR			
2	**a**	Derive the equation of motion for a damped single degree of freedom system with forced vibration.	**CO1**	**L3**	**6M**
	b	Briefly explain oscillatory motion.	**CO1**	**L2**	**6M**

UNIT-II

3		Derive the solution for an undamped single-degree-of-freedom system with free vibration.	**CO2**	**L3**	**12M**
		OR			
4		Derive the expression for the logarithmic decrement for the damped free vibration of the SDOF for **i)** Two successive cycles **ii)** Two cycles of N cycles apart	**CO3**	**L3**	**12M**

UNIT-III

5		Briefly explain the orthogonal properties of normal modes.	**CO4**	**L2**	**12M**
		OR			
6		Draw the mode shapes for the given problem.	**CO4**	**L1**	**12M**

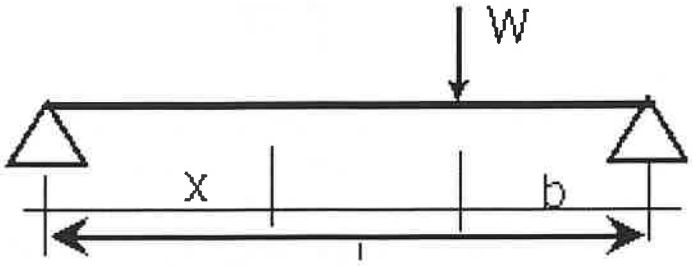


UNIT-IV

7		Derive the equation of motion for a beam subjected to a uniform distributed load.	**CO5**	**L3**	**12M**
		OR			
8		Derive the natural frequency and mode shapes for a uniform beam having both ends free.	**CO5**	**L3**	**12M**

UNIT-V

9	Explain the step-by-step procedure of the Holzer method. Derive fundamental natural frequencies and mode shapes.	CO6	L2	12M
	OR			
10	Find the fundamental natural frequencies and mode shapes of the vibratory system for the figure below.	CO6	L2	12M



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