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AA563

M. Tech. EXAMINATION, 2020

(First Semester)

(B Scheme) (Re-appear)

CE(SE)

CES507

DYNAMICS OF STRUCTURES

Time : 2½ *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks. Assume any data if missing in the question paper.

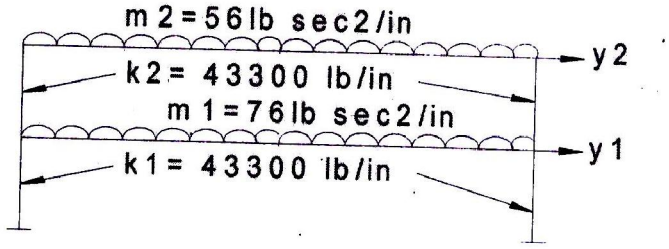
1. It is observed that the amplitude of free vibration of a certain structure modeled as a

single degree of freedom systems, decreases for 1 to 4 in 10 cycles. What is the percentage of critical damping ?

2. Derive the expression for the Damped and Undamped single degree of freedom with the help of the free body diagrams. Explain D' Alembert's principle.

3. Derive the expression for the response to a loading represented by Fourier series.

4. By Rayleigh's method, determine the natural frequency of the two storey frame shown in figure. Assume the horizontal members are very rigid compared to the columns of the frame.



5. Explain Stodola's method of determining the fundamental frequency with the help of an example.

6. How will you analyse the multistory frame for ballast loading. How dynamic analysis of the building for earthquake is done according to Indian standard ?

7. The spring stiffnesses of a two-spring system are K_1 = 55 kN/m and K_2 = 25 kN/m. It is subjected to tensile forces T of 30 kN. Evaluate the displacements Δ_2, Δ_3 and internal forces T_1, T_2 in the springs.

8. Write down the expression for solution of the differential equation of motion for a frame.