

No. of Printed Pages : 03

Roll No. ....

**AA-563**

**M. Tech. EXAMINATION, Dec. 2017**

(First Semester)

(Main & Re-appear)

**DYNAMICS OF STRUCTURES**

**CES-507**

*Time : 3 Hours]*

*[Maximum Marks : 75*

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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.

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

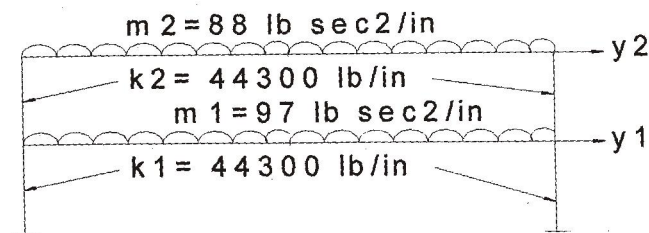
1. It is observed that the amplitude of free vibration of a certain structure modeled as a

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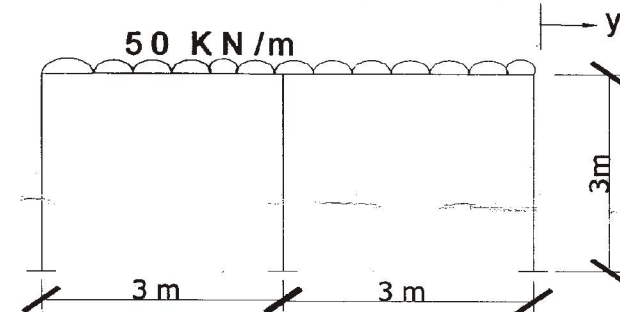
**P.T.O.**

single degree of freedom systems, decreases from 1 to .4 on 10 cycles. What is the percentage of critical damping ? **15**

2. Derive the expression for numerical evaluation of Duhamel's integral-undamped system. **15**
3. Explain D'Alembert's principle. Derive the expression for the Damped and Undamped single degree of freedom with the help of the free body diagrams. **15**
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. **15**
6. How you will analyse the multistorey frame for ballast loading. How dynamic analysis of the building for earthquake is done according to Indian standards. **15**
7. Find out the natural frequency for horizontal motion of the steel frame in figure. Assume the horizontal girder to be infinitely rigid and neglect the mass of the columns. **15**



8. Write down the expression for solution of the differential equation of motion for a rectangular beam. **15**