

M. Tech 2nd Semester Civil Engg. (Specialization in
Structural Design

Examination, May-2015

STRUCTURAL DYNAMICS & EARTHQUAKE

ENGINEERING

Paper-MTSD-201

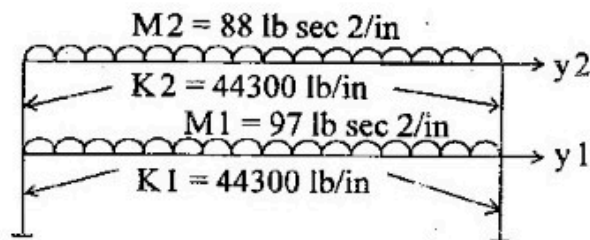
Time allowed : 3 hours]

[Maximum marks : 100

Note : Attempt any five questions. All questions carry equal marks.

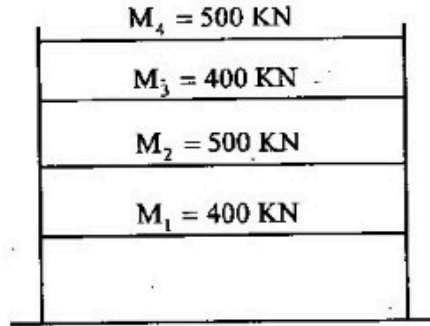
Assume any data if missing in the question paper.

1. Derive the expression for numerical evaluation of Duhamel's integral-undamped system. 20
2. By Rayleigh's method, determine the natural frequency of the two storey frame shown in Fig. Assume the horizontal members are very rigid compared to the columns of the frame. 20



3. It is observed that the amplitude of free vibration of a certain structure modeled as a single degree of freedom systems, decreases from 1 to 0.4 in 10 cycles. What is the percentage of critical damping? 20
4. 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. 20
5. How damping coefficient of a system is found out practically? Explain Logarithmic decrement in detail. <http://www.HaryanaPapers.com> 20
6. Explain the nature of dynamic loads like earthquake, wind and blast loads. What is their method of discretization? 20
7. A four storey steel frame building as shown in fig. is situated at Rohtak. The height of the building is 24 m (6 m each). The dead and live load is lumped at respective floor. The soil below the foundation is hard rock. Take $I = 1.5$, determine the total base shear as per

IS 1893 : 2002 and distribute it along the height of the building.



8. Explain Stodola's method of determining the fundamental frequency with the help of an example. 20

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