

Reg. No.

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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR  
(AUTONOMOUS)**

**M.Tech I Year I Semester Regular & Supplementary Examinations February 2018**

**STRUCTURAL DYNAMICS  
(Structural Engineering)**

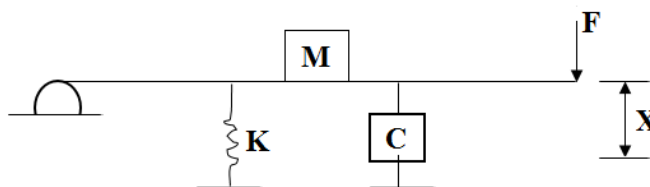
Time: 3 hours

Max.Marks:60

(Answer all Five Units 5 X 12 =60 Marks)

**UNIT-I**

- 1 a What is mathematical model with specific reference to structural dynamics. 5M  
b Derive the equation of motion for given system



7M

**OR**

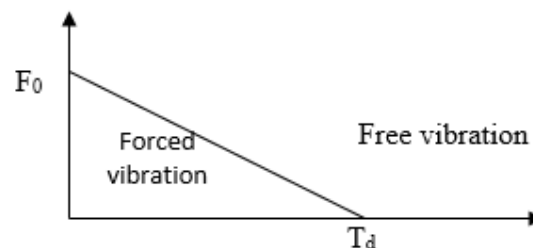
- 2 a Describe types and characteristics of typical dynamic loading with examples and essential characteristics of dynamic problem? 5M  
b Describe various method of discretization analysis of dynamic problem. 7M

**UNIT-II**

- 3 a Derive the equation for DMF for undamped single degree of freedom system with forced vibration. 6M  
b Derive the solution for damped single degree of freedom system with forced vibration 6M

**OR**

- 4 a Derive expression for Duhamel integral 5M  
b Determine the response of SDOF system subjected to triangular pulse load.



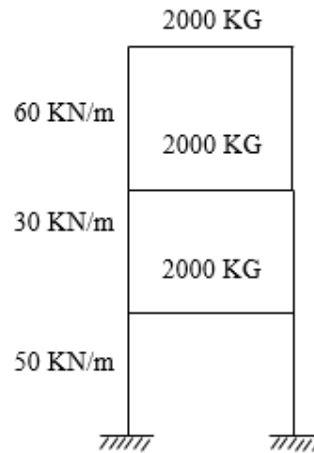
7M

**UNIT-III**

- 5 a Derive an expression for undamped free vibration of Multi Degree of Freedom System 6M  
b Briefly explain orthogonal properties of normal modes. 6M

OR

- 6 Draw the mode shapes for given problem.

**UNIT-IV**

- 7 a Derive the equation of motion for beam subjected to uniformly distributed load. 6M  
 b Derive the natural frequency and mode shapes for uniform beam having one end fixed other end simply supported. 6M

OR

- 8 a Draw the mode shapes for uniform beam having both ends fixed. 6M  
 b Derive the natural frequency and mode shapes for uniform beam having both end simply supported. 6M

**UNIT-V**

- 9 Explain step by step procedure of Holzer method? Derive fundamental natural frequencies and mode shapes? 12M

OR

- 10 Explain step by step procedure of Transfer matrix method? Derive fundamental natural frequencies and mode shapes? 12M

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