

Reg. No:

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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
 (AUTONOMOUS)
M.Tech I Year I Semester (R16) Regular Examinations January 2017
STRUCTURAL DYNAMICS
 (Structural Engineering)
 (For Students admitted in 2016 only)

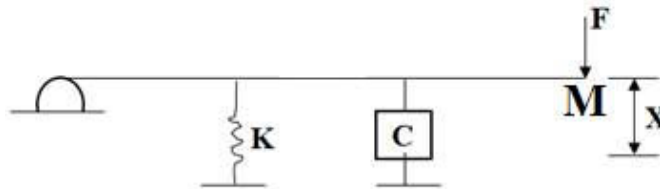
Time: 3 hours

Max. Marks: 60

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

UNIT-I

- Q.1** a. Briefly explain about Harmonic Excitation and D'Alemberts principle 6M
 b. Derive the equation of motion for given system



6M

OR

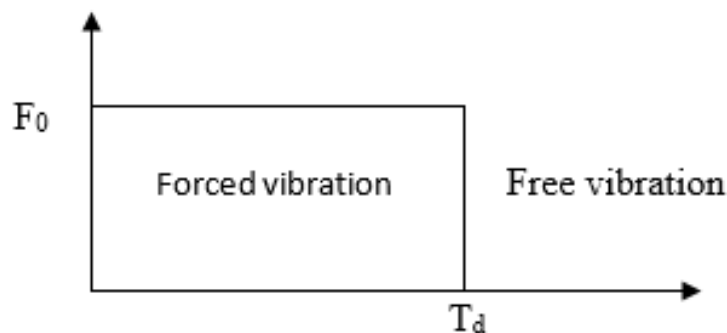
- Q.2** a. Derive the expression for time period of simple harmonic motion. 6M
 b. Briefly explain fundamental objectives of dynamic analysis with examples. 6M

UNIT-II

- Q.3** a. Derive the solution for damped single degree of freedom system with free vibration. 6M
 b. Obtain the response expression for a single degree freedom system with damping under the excitation of harmonic load $F_0 \sin pt$. 6M

OR

- Q.4** a. Derive the formula for Damping ratio & Frequency ratio for undamped single degree of freedom system with forced vibration. 5M
 b. Determine the response of SDOF system subjected to rectangular pulse load.



7M

UNIT-III

- Q.5** a. Derive the equation of motion for two degree of freedom system in matrix form and also the solution for the equation. 6M

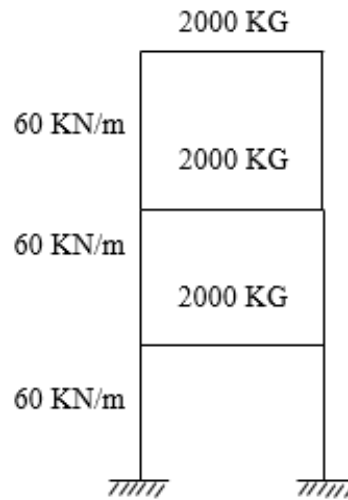
b. Briefly explain orthogonal properties of normal modes.

6M

OR

Q.6 Draw the mode shapes for given problem.

12M



UNIT-IV

Q.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

Q.8 a. Draw the mode shapes for uniform beam having one end fixed other end free.

6M

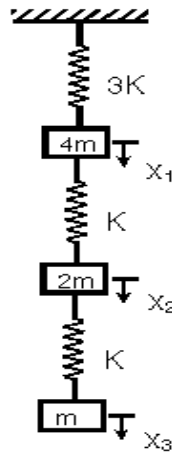
b. Derive the natural frequency and mode shapes for uniform beam having both end simply supported.

6M

UNIT-V

Q.9 For the given system, find the lowest natural frequency by Stodola's method.

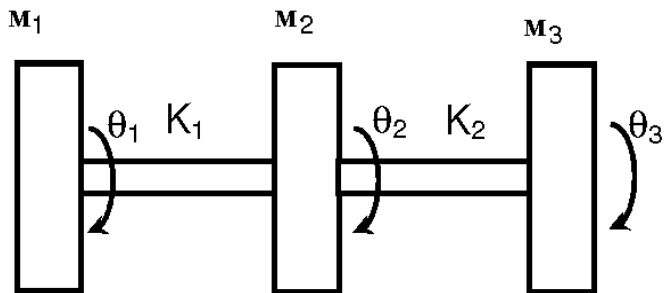
12M



OR

Q.10 For the system shown in figure, obtain natural frequencies using Holzer's method?

12M



***** END *****