R19

Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Regular Examinations Oct-2020
STRUCTURAL DYNAMICS
(Structural Engineering)

Time: 3 hours   Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1 Explain different types of vibration problems and derive their equations of motion. **12M**

OR

2 Write short notes on **12M**
   (i)   Degrees of freedom system,
   (ii) Simple harmonic motion, and
   (iii) D'Alemberts principle.

UNIT-II

3 **a** Derive an expression for un-damped forced vibration of SDOF subjected to harmonic excitation. **8M**
   b Write short notes on logarithmic decrement. **4M**

OR

4 **a** Derive an expression for equation of motion for free un-damped SDOF system. **8M**
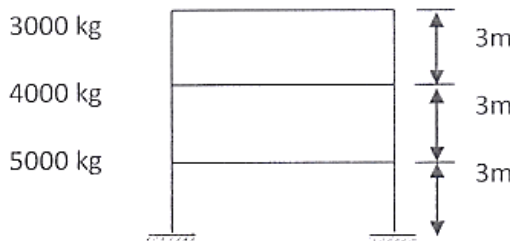   **b** Write short notes on the band width method. **4M**

UNIT-III

5 **a** Formulate the equation of motion for un-damped free vibrations of MDOF system. **8M**
   b Write short notes on dynamic equilibrium. **4M**

OR

6 Determine the natural frequencies and mode shapes of the given MDOF system? Take $EI=5x10^6$ N-m^2 for all the columns. **12M**

UNIT-IV

7 Derive the natural frequency and mode shapes for an uniform beam having one end fixed and the other end simply supported. **12M**
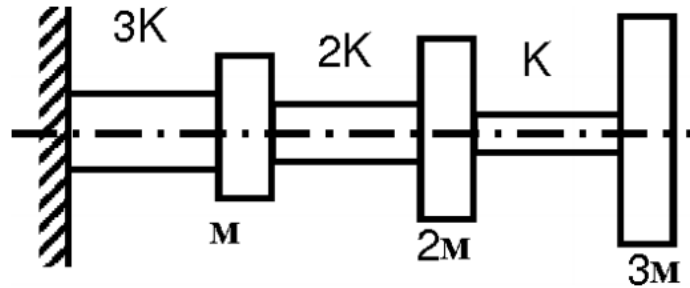
OR

8 **a** Derive the equation of motion for the beam subjected to uniformly distributed load. **7M**
   b Write short notes on flexural vibrations of beams. **5M**

UNIT-V

9   Calculate the approximate natural frequency of a system shown below by using   **12M**
Transfer matrix method?

OR

10 Explain step by step procedure of Stodola's method. Derive the fundamental natural   **12M**
frequencies and mode shapes.

*** END ***