INSTITUTE OF AERONAUTICAL ENGINEERING

(AUTONOMOUS)

Code No: BST004

MODEL QUESTION PAPER - I

M.Tech- II Semester Regular Examinations, February 2017

STRUCTURAL DYNAMICS

(Structural Engineering)

Time: 3 hours Max. Marks: 70

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT-1

1 (a) Derive the solution for forced undamped single degree of freedom system (7M)

(b) Calculate the equation of motion and solution of a undamped single degree of freedom system with free vibration. (7M)

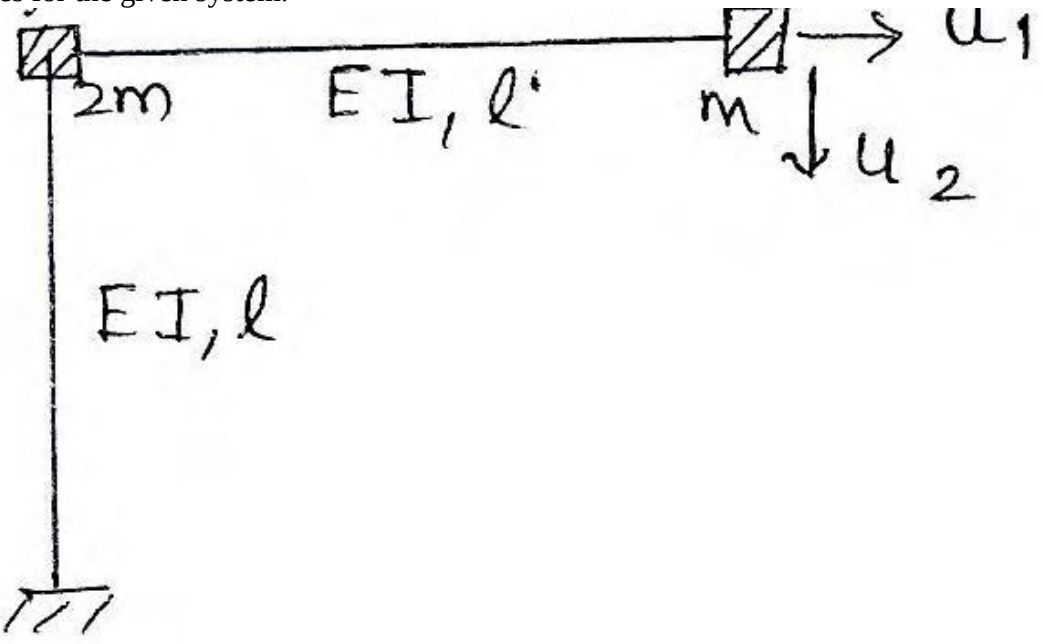
OR

2 (a) State Logarthmic decrement and explain it. (8M)

b) Define i) Dynamic magnification factor ii) Oscillatory motion iii) Degrees of freedom (6M)

Unit -II

3. Analyse the differential equation of motion and determine the natural frequencies and mode shapes for the given system.



(14M)

OR

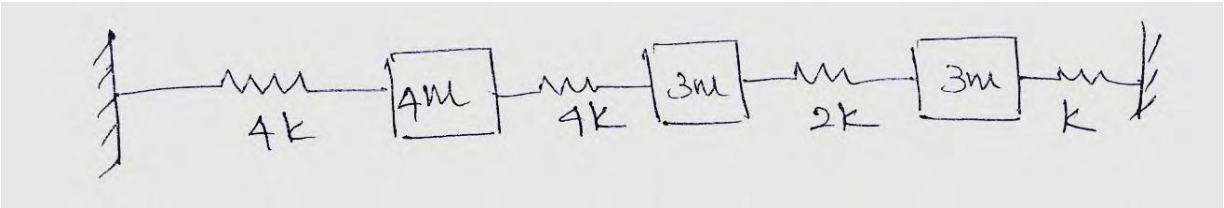
4. Derive the normal modes of vibration of double pendulum with same length and mass of pendulum.

(14 M)

Unit-III

5.Analyze the Natural frequencies and mode shape for the given system and Check the orthogonality conditions.

.



(14M)

OR

6. Create a model with four degree of freedom system and derive the equation of motion. (14M)

Unit-IV

7 (a) Derive governing of differential equation of motion (7M)

(b) Explain natural frequencies of simple beams with different ends (7M)

OR

8. For the multistory building shown in fig.5. Obtain frequencies and modes of vibration using Stodolla's method. Assume m = 5 x 10^4 kg, k= 5 x 10^4 kN/cm.

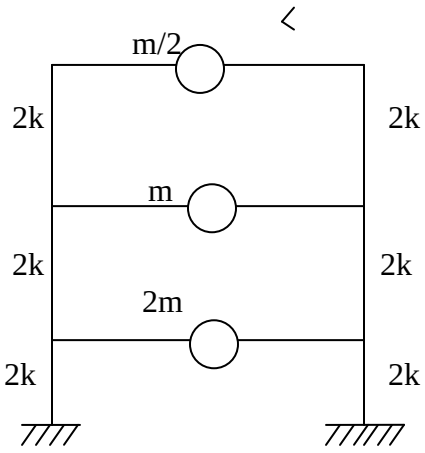


fig.5 (14M)

Unit-V

9. Explain I.S. Code methods of analysis for obtaining response of multistoried buildings (14M)

OR

10. Explain lumped mass approach in SDOF Systems (14M)

INSTITUTE OF AERONAUTICAL ENGINEERING

(AUTONOMOUS)

Code No: BST004

MODEL QUESTION PAPER - II

M.Tech- II Semester Regular Examinations, February 2017

STRUCTURAL DYNAMICS

(Structural Engineering)

Time: 3 hours Max. Marks: 70

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT-1

1 (a) Derive the solution for damped single degree of freedom system (7M)

(b) Calculate the equation of motion and solution of a damped single degree of freedom system with free vibration. (7M)

OR

2 (a) State lumped mass idealization and explain it. (6M)

b) Define i) critical damping ii)phase angle iii) band width iv)damped vibration (8M)

Unit -II

3. (a) State D Alemberts principle? Explain how the principle is employed in vibration problems. (7M)

(b) Develop the expression for the free vibration of an undamped 2DOF system

(7M)

OR

4. Evaluate the natural frequency and mode shape of the two degree of freedom system shown in fig. 1

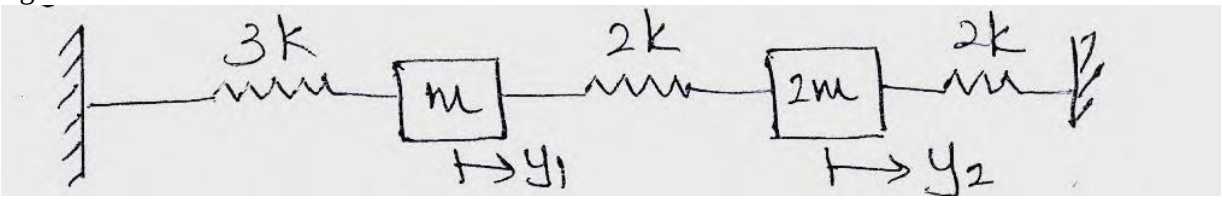


Fig.1 (14 M)

Unit-III

5 Analyze the Natural Frequencies and mode shape of the shear building shown in fig. 2
.

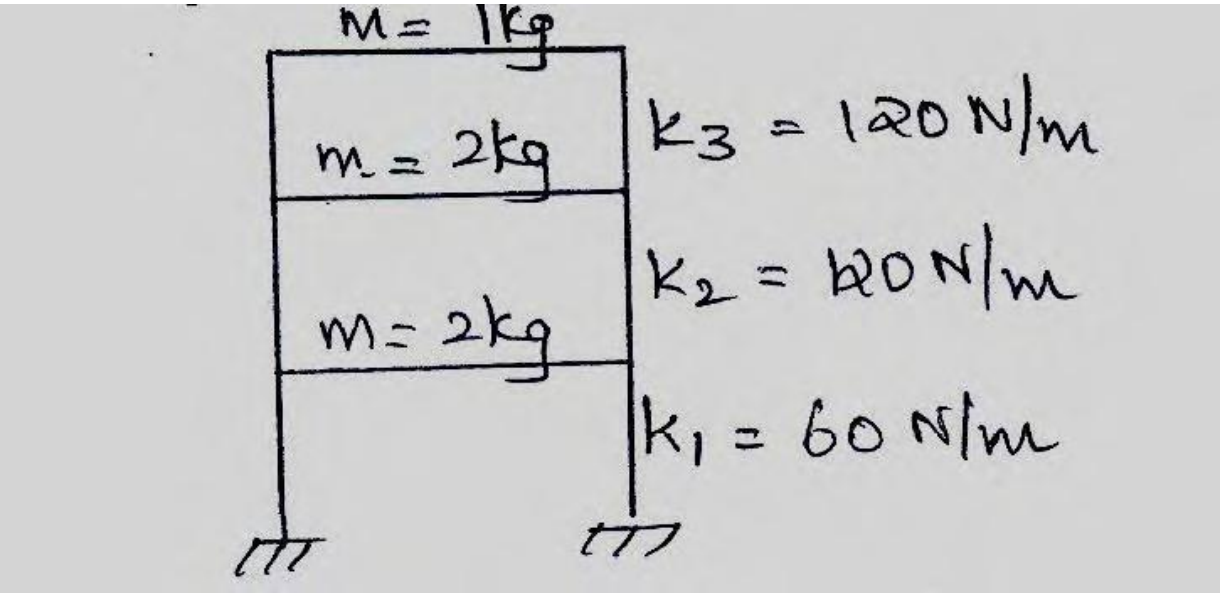


fig.2

(14M)

OR

6 (a) Explain the procedure for mathematical modeling for a multi-degree freedom system.

(8M)

(b) Analyse the concept of orthogonality of normal modes.

(6M)

Unit-IV

7 (a) Analyze the undamped free vibrations of beam in flexure (7M)

(b) Explain mode shapes of simple beams with different ends (7M)

8 a) Explain principle of applications to continous beams(7M)
b) State holzer method and explain with example (7M)

UNIT-V

9 . Explain exicitation by rigid base translation for earthquake analysis

(14M)

OR

10.Explain lumed mass approach in MDOF Systems (14M)