

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**M.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018**Subject: Structural Dynamics

Branch/Specialization: CE/ Structural Engg.

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x4Mark=20 Marks

1. Discuss about Degrees of Freedom.
2. Write about Duhamel's Integral.
3. Write about Un Damped free vibrations.
4. Discuss about the STODALA method.
5. Discuss briefly about the 'Response Spectrum Method' for the analysis of frames against earthquake loading.

PART-B

Answer any FIVE Questions of the following

5x8Marks= 40 Marks

1. A structure is modeled as a viscously damped oscillator with a spring constant $K=6500$ kN/m and un-damped natural frequency $\omega_n = 25$ rad/s. Experimentally it was found that a force of 0.8 kN produced a relative velocity of 70 mm/s in the damping element. Determine: (i) the damping ratio ξ ; (ii) the damped period T_d ; (iii) the logarithmic decrement of damping δ ; and (iv) the ratio between two consecutive amplitudes.
2. Describe how the equation of motion can be set up using Newton's second law of motion for the system shown in Fig1.

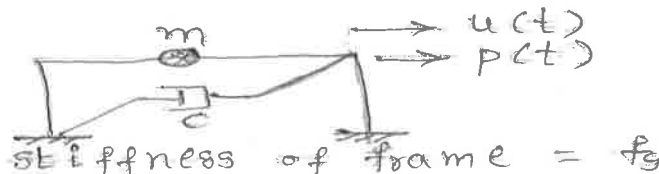


Fig 1

3. The stiffness matrix and mass matrix of 2DOF system is governed by

$$K = \begin{Bmatrix} 300 & -300 \\ -300 & 500 \end{Bmatrix} \text{ N/m; } m = \begin{Bmatrix} 2 & 0 \\ 0 & 3 \end{Bmatrix} \text{ kg.}$$

Determine the natural frequencies of the systems.

4. Explain the natural frequencies and mode shapes of simple beams with different end conditions.
5. Explain the I S code methods of analysis for obtaining response of multistoried building.
6. Define the following terms
 - a. (i) Periodic motion. (ii). Time period.
 - b. Explain D'Alemberts principle
7. a. Formulate equation of motion for un-damped free vibrations of MDOF system.
b. Explain about Flexural vibration of beams.
8. Write short notes on any TWO of the following
 - a. Harmonic motion
 - b. Degree of freedom
 - c. Principle of virtual work.

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M.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018Subject: Bridge EngineeringBranch/Specialization: **CE/ Structural Engg.****Time: 3 hours****Max. Marks: 60****PART – A****Answer ALL questions of the following****5x4Mark=20 Marks**

1. What are the types of loads consider in the code. Explain them in detail?
2. Explain impact effect for IRC class A or B loading?
3. Write the classification of Steel bridges?
4. Explain in detail the types of Pre-Stressed Concrete Bridges.
5. Explain the various types of loads that can be acted on Abutments.

PART-B**Answer any FIVE Questions of the following****5x8Marks= 40 Marks**

- 1.) a) What are the different type bridges? Classify each with help of neat sketch.
b) What are the different types of loads?
- 2.) Write short notes on the following.
 - (a) Working principle of Pre-Stressed Concrete.
 - (b) Erection Forces
 - (c) Lateral loads
- 3.) a.) What is the difference between bow string Girder Bridge and Arch Bridge (without bow string).
b.) Explain the Grillage Analogy concept.
- 4.) a.) What are the types of pot bearings and explain them clearly with a neat sketch?
b.) How to design pot bearings and explain them with clear steps?
- 5.) Explain the Design criteria for pre-stressed concrete bridge step by step.
- 6.) a) Discuss the various parameters involved in Analysis of bridge.
b) Write a short note on Harmonic analysis and Folded plate theory
- 7.) a) Define Pier, Bed block and Abutment cap?
b) What are the types of bridge foundations, brief them with a neat sketch?
- 8.) Write short notes on any two of the following
 - a) Back fill behind the abutments
 - b) What are the forces considered while designing?
 - c) Maintenance measures of bridges

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Branch/Specialization: CE/ Structural Engg.

Time: 3 hours

Max. Marks: 60

PART-A

Answer All Questions

5 X 4M = 20 M

1. Explain the local and global coordinates with suitable examples.
2. Define a banded matrix and explain its salient features.
3. Obtain the flexibility matrix of a stepped structural element of length ' L ' with the coordinates shown in Fig.1.

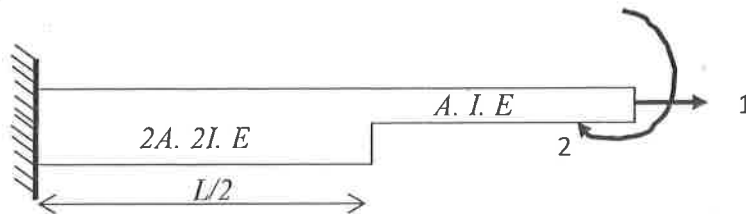


Fig.1.

4. Derive the stiffness matrix of a grid element. Adopt usual notation.
5. Explain the necessity of a shear wall in a building.

PART -B

Answer any FIVE questions

5 X 8 M = 40 Marks

1. (a) Derive the stiffness matrix of a beam element (L , A , I & E). (4 M)
1. (b) Define stiffness and flexibility coefficients. Also derive the relationship between the stiffness and flexibility matrices. (4 M)
2. (a) Explain the step-by-step procedure to obtain the global stiffness matrix from the element stiffness matrices. (5 M)
2. (b) Explain the semi-bandwidth. (3 M)

3. Analyse a beam supported and loaded as shown in Fig. 2, using flexibility method. (8 M)

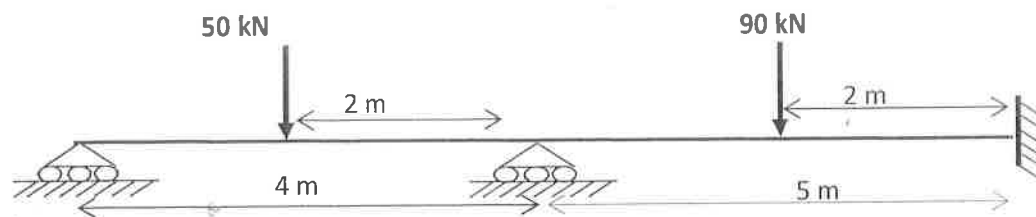


Fig. 2

4. Using flexibility method, analyse the plane truss shown in Fig.3. Assume the axial rigidity of the members is the same. (8 M)

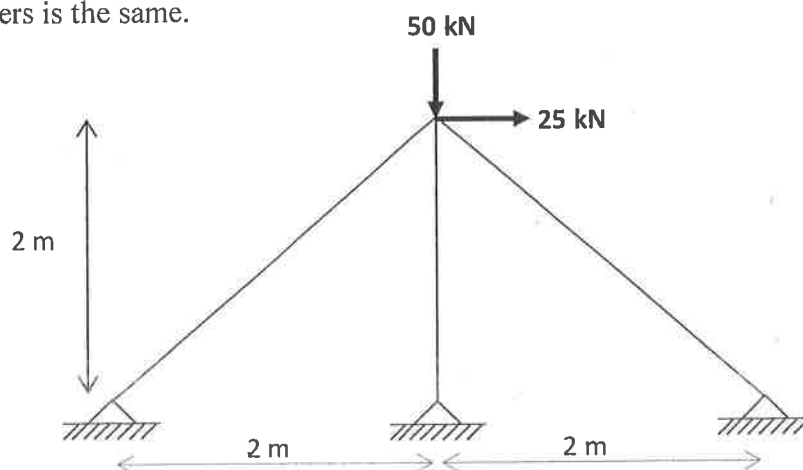


Fig. 3

5. Analyse a beam supported and loaded as shown in Fig. 4, using stiffness method. (8 M)

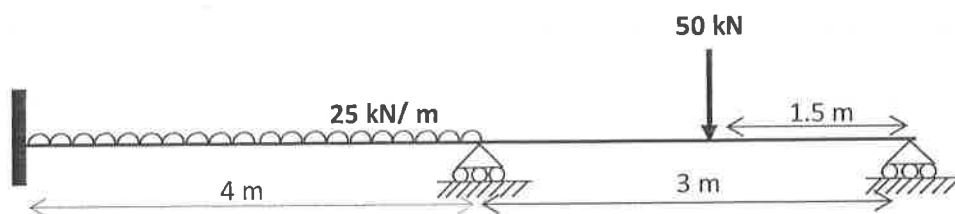


Fig. 4

6. Using stiffness method analyse the plane frame supported and loaded as shown in Fig.5. (8 M)

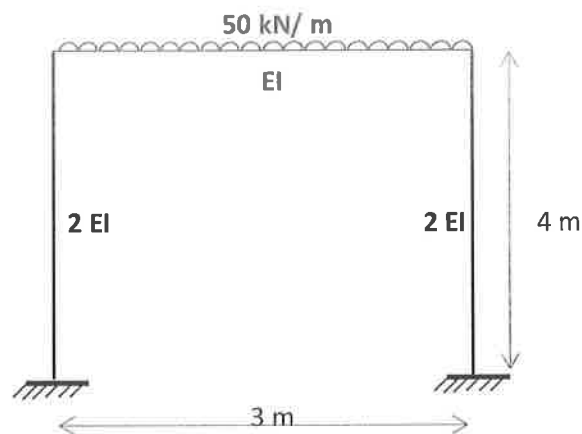


Fig. 5

7. (a) Explain in detail about the static condensation. (4 M)

7. (b) How do you take initial stress in the structure into account for the analysis. (4 M)

8. Explain the structural behaviour of large frames with and without shear walls. (8 M)

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M.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018Subject: Advanced Concrete Technology

Branch/Specialization: CE / Structural Engg.

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x4Mark=20 Marks

1. Distinguish between Plasticizers and Superplasticizers.
2. Explain Abram's law.
3. What is meant by high performance concrete?
4. Enumerate the advantages of Self compacting concrete over normal concrete.
5. Define formwork. What are the materials used for formwork?

PART-B

Answer any FIVE Questions of the following

5x 8 Marks= 40 Marks

1. (a) Discuss about the Mineral admixtures that are used in concrete.
(b) How do you combine the aggregate for specified grading?
2. (a) Explain various factors affecting shrinkage of concrete.
(b) Explain Rebound Hammer testing method to evaluate the quality of concrete.
3. Explain design of High Strength concrete using Erintroy Shaklok method.
4. (a) Explain the polymer concrete.
(b) What are the factors to be considered in concrete mix proportion?
5. (a) Explain the method for removal of formwork.
(b) Compare steel formwork and timber formwork.
6. (a) What is meant by fineness modulus of aggregate?
(b) Explain various factors affecting the workability of concrete.
7. (a) Write the properties of high performance concrete.
(b) Write short notes on Light Weight Aggregate.
8. Answer any two
 - (a) Write short notes on Maturity concept.
 - (b) Explain the types of cement.
 - (c) What are the requirements for a good formwork?

