



III B.Tech I Sem Regular End Examination, December 2022

Structural Analysis-II

(Civil)

Time: 3 Hours.**Max. Marks: 70**

Note: 1. Question paper consists: Part-A and Part-B.

2. In Part - A, answer all questions which carries 20 marks.

3. In Part - B, answer any one question from each unit.

Each question carries 10 marks and may have a, b as sub questions.

PART- A**(10*2 Marks = 20 Marks)**

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|-------|---|----|-----|-----|
| 1. a) | What are the disadvantages of slope deflection method? | 2M | CO1 | BL1 |
| b) | What is distribution factor? | 2M | CO1 | BL1 |
| c) | What is the effect of temperature on arches? | 2M | CO2 | BL1 |
| d) | Mention the uses if influence line diagrams | 2M | CO2 | BL1 |
| e) | What is degree of redundancy? | 2M | CO3 | BL1 |
| f) | Distinguish between determinate and indeterminate structures. | 2M | CO3 | BL2 |
| g) | Stiffness method is also called as displacement method. Why? | 2M | CO4 | BL1 |
| h) | Differentiate stiffness method with flexibility method. | 2M | CO4 | BL2 |
| i) | What is plastic moment? | 2M | CO5 | BL1 |
| j) | What is the difference between elastic and plastic hinge? | 2M | CO5 | BL1 |

PART- B**(10*5 Marks = 50 Marks)**

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|-----------|--|-----|-----|-----|
| 2 | Single bay single storey portal frame ABCD is fixed at A and D. The height of the columns AB and CD is 5m. The span of the beam BC is 6m. A uniformly distributed load of 60 KN/m is acting on the whole span BC. All members have the same flexural rigidity. Calculate the support reactions and also draw the bending moment diagram for the portal frame. Analyze the frame using Slope deflection method. | 10M | CO1 | BL3 |
| OR | | | | |
| 3 | A two span continuous beam ABC is fixed at A and simply supported at B and C. AB carries an UDL of 12KN/m and BC is subjected to a point load of 40 KN at its mid span. Span of AB = 4m and BC = 6m. Analyze the beam by using moment distribution method. | 10M | CO1 | BL3 |
| 4 | A two hinged semi circular arch of radius R is subjected to a uniformly distributed load of w/unit length over the entire span. Assuming EI to be constant, determine the horizontal thrust | 10M | CO2 | BL3 |

OR

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|-----------|---|-----|-----|-----|
| 5 | State and prove Muller Breslau principle | 10M | C02 | BL3 |
| 6 | A two span continuous beam ABC is fixed at A and C. AB carries an UDL of 10KN/m and BC is subjected to a point load of 40 KN at 3m from C. Span of AB = 6m and BC = 4m. Analyze the beam by using flexibility method. The moment of inertia is constant throughout. | 10M | C03 | BL3 |
| OR | | | | |
| 7 | A two span continuous beam ABC is fixed at A and simply supported at B and C. AB carries an UDL of 12KN/m and BC is subjected to a point load of 40 KN at its mid span. Span of AB = 4m and BC = 6m. Analyze the beam by using flexibility method. | 10M | C03 | BL3 |
| 8 | A two span continuous beam ABC is fixed at A and C. AB carries an UDL of 10KN/m and BC is subjected to a point load of 40 KN at 3m from C. Span of AB = 6m and BC = 4m. Analyze the beam by using stiffness method. The moment of inertia is constant throughout. | 10M | C04 | BL3 |
| OR | | | | |
| 9 | A two span continuous beam ABC is fixed at A and simply supported at B and C. AB carries an UDL of 12KN/m and BC is subjected to a point load of 40 KN at its mid span. Span of AB = 4m and BC = 6m. Analyze the beam by using stiffness method. | 10M | C04 | BL3 |
| 10 | a) Explain the theorems of plastic analysis | 5M | C05 | BL4 |
| | b) Derive an expression for shape factor of triangular section | 5M | C05 | BL6 |
| OR | | | | |
| 11 | A cable of horizontal span 21 m is used to support six equal loads of 40 kN each at 3m spacing. The central dip of the cable is limited to 2.0 m. Find the length of the cable required and its sectional area if the safe tensile stress is 750 N/mm ² | 10M | C05 | BL3 |

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CO - Course Outcome

BL - Blooms Taxonomy Levels