Code No: R2031011 **R20** SET - 1

III B. Tech I Semester Regular/Supplementary Examinations, December -2023
STRUCTURAL ANALYSIS
(Civil Engineering)

Time: 3 hours Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
*****

UNIT-I

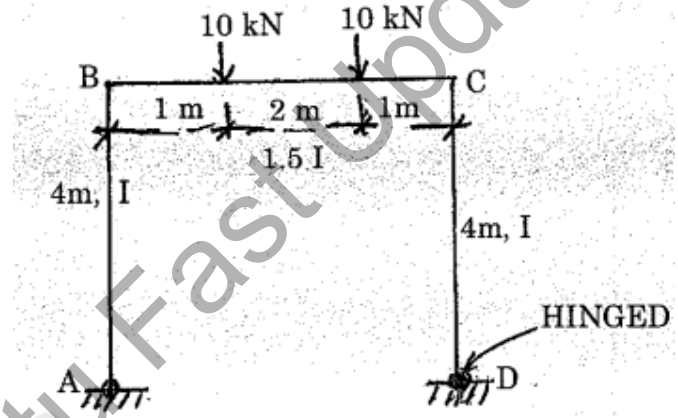
1. Find the support moment for the propped cantilever carrying uniformly varying load w/unit length from A to B. Draw S.F.D and B.M.D. [14M]

(OR)

2. a) A fixed beam AB of length 6m carries a point load of 160KN and 120 KN each at a distance of 2m and 4m from left end A. Find the fixed end moments and the reaction at the supports and draw BMD and SFD. [10M]
   b) Is fixed beam determinate or indeterminate? Give reasons. [4M]

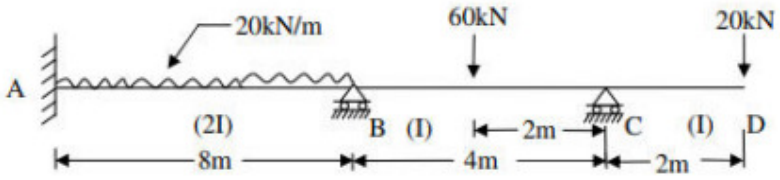
UNIT-II

3. Analyze the portal frame ABCD shown in figure by Moment Distribution method and E= 2 x10^5 N/mm^2 ,I= 2 x 10^9 mm^4 [14M]



(OR)

4. Analyze the beam ABCD shown in figure by Slope-Deflection method and draw bending moment diagram. [14M]



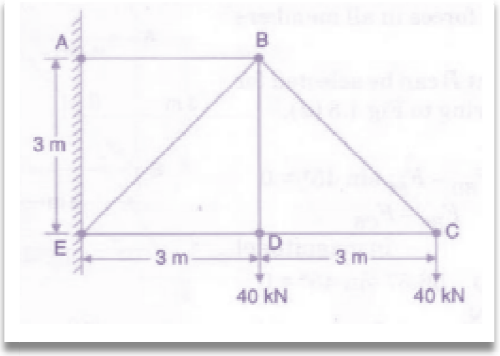
UNIT-III

5. a) Explain about types of Frames [7M]
   b) Explain about methods of Analysis in Frames [7M]

(OR)

|'''|'|'|''||'''||||

6. Find the forces in all the members of the truss shown in figure. [14M]



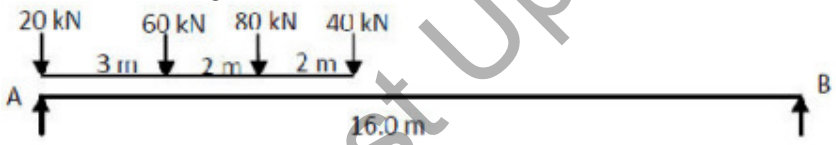
UNIT-IV

7. a) Draw the qualitative influence line diagram for support moment of a fixed beam [9M]

   b) Distinguish between ILD and BMD [5M]

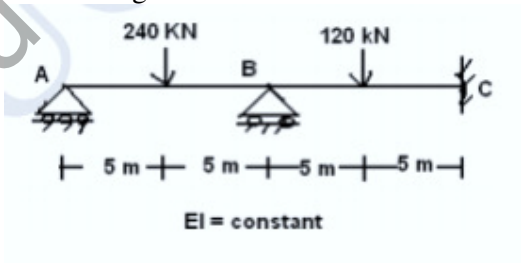
(OR)

8. A train of concentrated loads shown in figure below. The loads move from left to right on a simply supported girder of span 16.0 m. Determine absolute maximum bending moment. [14M]



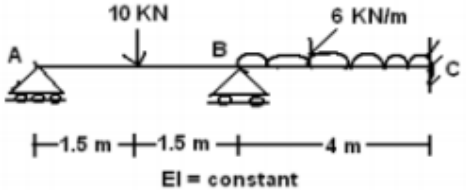
UNIT-V

9. Analyze the continuous beam shown in figure below by stiffness method and draw shear force and bending moment. [14M]



(OR)

10. Analyze the continuous beam shown in figure below by force method and draw shear force and bending moment [14M]



Code No: R2031011 **R20** SET - 2

III B. Tech I Semester Regular/Supplementary Examinations, December -2023
STRUCTURAL ANALYSIS
(Civil Engineering)

Time: 3 hours Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
*****

UNIT-I

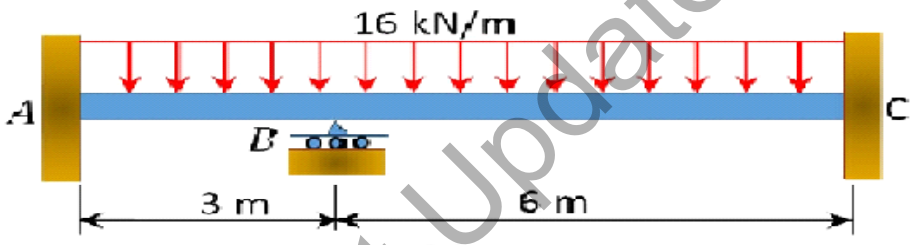
1. Explain the procedure for the analysis of propped cantilever with neat sketches of BMD and SFD for one example? [14M]

(OR)

2. Determine fixed End moments of a fixed beam of span 4 m. If support at right end sinks by 1 cm due to UDL of 1500 N/m. I = 40000 cm^4 , E = 2 × 10^6 N/mm^2 . [14M]

UNIT-II

3. Analyze the continuous beam shown in below Figure. by Slope-Deflection method and draw bending moment diagram. [14M]

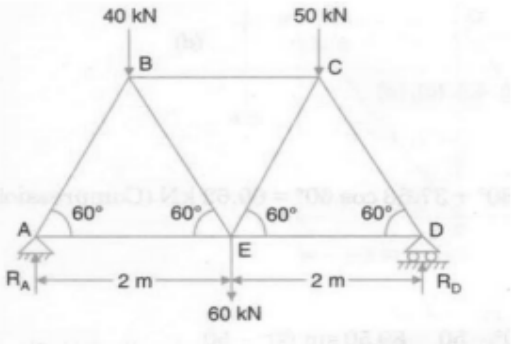


(OR)

4. A Continuous beam is fixed at A and is supported over rollers at B and C. AB=BC=12M.The beam carries a uniformly distributed load of 30kN/m over AB and a point load of 240kN at a distance of 4M from B on span BC. B has an settlement of 30mm.E= 2 x10^5 N/mm^2,I= 2 x 10^9 mm^4 . Analyze the beam by Slope Deflection Method. [14M]

UNIT-III

5. Determine the forces in all the members of the truss shown in figure and indicate the magnitude and nature of the forces on the diagram of the truss. All inclined members are at 60˚ to horizontal and length of each member is 2m. [14M]



(OR)

|'''|'|'|''||''||||

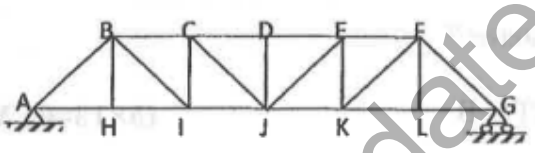
6. Explain the procedure for method of joints by considering the example of plane frame [14M]

UNIT-IV

7. Draw the influence line diagrams for forces in the members of a Warren Truss. [14M]

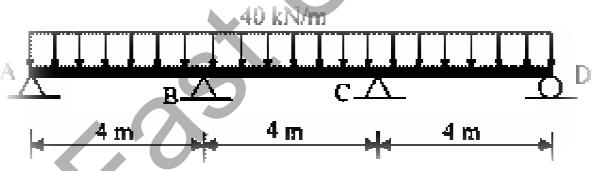
(OR)

8. Draw the ILD for force in member BC and CI for the truss shown in figure the height of each truss was 8m long and 8m height. [14M]



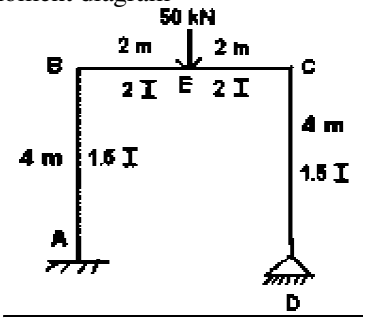
UNIT-V

9. Analyze the continuous beam shown in figure below by flexibility method draw shear force and bending moment M_b and M_c moments are redundant [14M]



(OR)

10. Analyze the portal frame ABCD shown in figure by stiffness method and draw shear force and bending moment diagram [14M]



Code No: R2031011 **R20** SET - 3

III B. Tech I Semester Regular/Supplementary Examinations, December -2023
STRUCTURAL ANALYSIS
(Civil Engineering)

Time: 3 hours Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
*****

UNIT-I

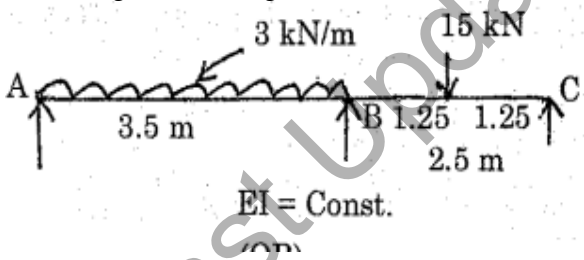
1. A propped cantilever beam 4 m long has 100 mm wide and 150 mm deep cross-section. If the allowable bending stress and the deflection at the centre is 45 MPa and 2.5 mm respectively. Determine the safe uniformly distributed load cantilever can carry. Take E = 140 GPa. [14M]

(OR)

2. Find the fixed end moments for a fixed beam of span 8 m subjected to a concentrated clockwise moment of 12 kNm at 2.5 m from the right end [14M]

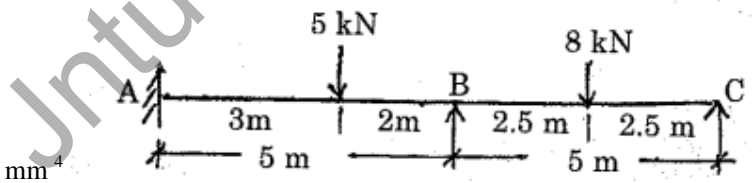
UNIT-II

3. Analyze the beam ABCD shown in figure by Slope-Deflection method and draw shear force and bending moment diagram [14M]



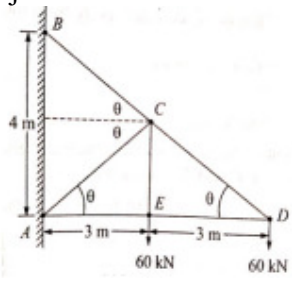
(OR)

4. Analyze the continuous beam as shown in figure by Moment Distribution method and draw shear force and bending moment diagram, E= 2 x10^5 N/mm^2 ,I= 2 x 10^9 mm^4 [14M]



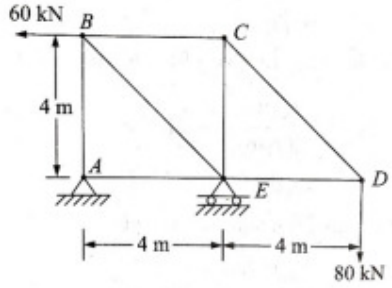
UNIT-III

5. Determine the forces developed in the all the members of trusses shown in the figure by using method of joints [14M]



(OR)

6. Determine the forces in all members of the truss shown in figure, by using method of tension coefficient [14M]

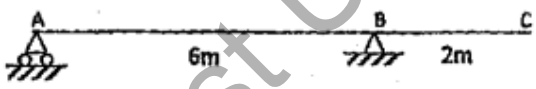


UNIT-IV

7. Define ILD and construct a ILD for shear force for a simply supported beam carrying a point load W. Explain how this generated ILD can be used for calculating shear and bending moment for a simply supported beam carrying U.D.L shorter than the span. [14M]

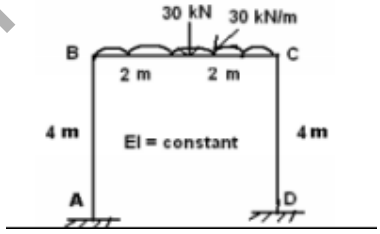
(OR)

8. Draw the ILD for shear to left of B for the overhanging beam shown in figure [14M]



UNIT-V

9. Analyze the portal frame ABCD shown in figure by stiffness method and draw shear force and bending moment diagram [14M]



(OR)

10. A cantilever beam subjected to a single concentrated load P at the middle of the span calculate the deflection of free end using the flexibility matrix method by considering EI as constant [14M]

Code No: R2031011 **R20** SET - 4

III B. Tech I Semester Regular/Supplementary Examinations, December -2023
STRUCTURAL ANALYSIS
(Civil Engineering)

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All Questions Carry Equal Marks
*****

UNIT-I

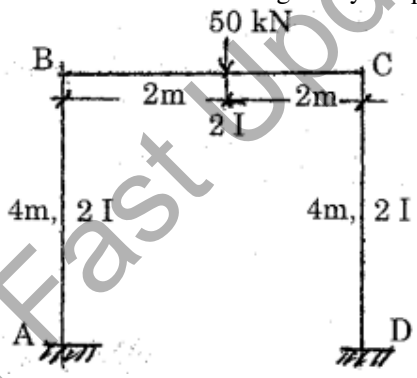
1. A timber beam 14cm wide, 20cm deep and 5m long is loaded with a uniformly distributed load .It is fixed at the left end and simply supported at the right end. If the maximum allowable fiber stress is 10N/mm^2 and right support settles by an amount equal to wl4 /24 EI, where w is load per meter run, determine the permissible value of load w. [14M]

(OR)

2. A cantilever of length 'L' carries a concentrated load 'W' at its mid-span. If the free end is supported by a prop, find the reaction at the prop and also draw the S.F. and B.M. diagrams. [14M]

UNIT-II

3. Analyze the portal frame ABCD shown in figure by Slope-Deflection method and take EI is constant [14M]

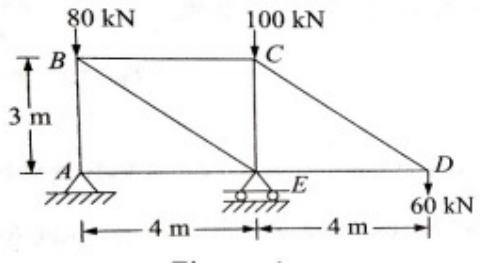


(OR)

4. A continuous beam ABC is simply supported at A and C and continuous over support B with AB = 8m and BC = 7m. A uniformly distributed load of 12kN/m is acting over the beam. The moment of inertia is I throughout the span. Analyze the continuous beam by Moment Distribution Method and draw S.F.D and B.M.D. [14M]

UNIT-III

5. Determine the forces developed in the all the members of trusses shown in the figure by using tension coefficient [14M]



(OR)

|'''|'|'|''||'''||||

6. Explain the procedure for method of sections by considering the one example of simply supported truss [14M]

UNIT-IV

7. Draw the Influence line diagram for reactions of a simply supported beam of 12 m span. Also draw the influence line diagrams for Shear force and bending moments at quarter span and mid-span sections. [14M]

(OR)

8. a) Draw the ILD for shear force 4m from the propped end of a propped cantilever beam of 7m calculate the ordinates at every 1 m [10M]

   b) How the ILD can be used in design [4M]

UNIT-V

9. Distinguish the procedure of flexibility and stiffness method with one example. [14M]

(OR)

10. Analyze the continuous beam ABC shown in figure by stiffness method and draw shear force and bending moment diagram [14M]