

TCE-502

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Odd Semester Examination, 2019-20
B. Tech: Civil (5th Semester)
Structural Analysis II

Time: 3:00 hrs.

M.M: 100

Total no. of printed pages: 4

- Note : (i) Attempt ALL questions.
(ii) Assume any missing data suitably.

Q1. Attempt any four of the following

4X5=20

- What is influence line diagram? Explain its significance in structure Analysis?
- What is meant by displacement matrix method?
- Draw the ILD for reaction and moment of fixed end of propped cantilever beam ?
- What is the difference between upper bound theorem and lower bound theorem?
- Name the three classical force methods used in analysis of continuous beam?
- Differentiate between kinematic and static indeterminacy with example.

Q2. Attempt any four of the following

4X5=20

- Derive the equations for horizontal thrust, bending moment at any section, radial shear and normal shear at any given section for a typical three hinged symmetric parabolic arch and also draw the schematic diagrams?
- Draw the influence line diagram for support reaction and bending moment at any section of simply supported beam? Using the ILD determine the support reactions and find bending moment at 2.5m, 4m, and 5m. For a simply supported beam of 8m subjected to three points load of 10 KN, 10KN and 5KN placed at 1m, 4 m and 6m respectively.
- The three hinged parabolic arch of 100m span is subjected to two point loads of 15 KN each placed at 20m and 50 m respectively. From the left hand hinge. Determine the shear force and bending moment in the girder at section 40 m from each end?
- A train of 4 wheel loads 120 KN, 100 KN, 350KN, 200KN spaced 1.5 m between consecutive loads moves on cross a simply supported beam of span 25 m from left to right with 200 KN load leading using ILD method find absolute bending moment any point of span.
- Derive the slope deflection equation and also find modifications equations when far end is hinged?

P.T.O

- f) A continuous beam ABC consists of spans AB and BC of lengths 3 m and 4 m respectively, the ends A and C being simply supported. If the spans AB and BC carry UDL of intensity 50 kN/m and 40 kN/m respectively, determine the support moments at A, B and C. Draw B.M diagrams. The moments of inertia for the spans AB and BC are I and 2I respectively

Q3. Attempt any two of the following

2x10=20

- a) Analyze the frame shown in figure 1. below by moment distribution method and draw bending moment diagram?

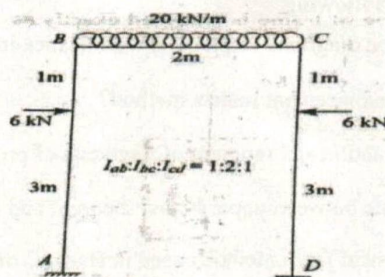


Fig. 1

- b) Determine the support moments for the continuous girder shown in figure 2 if the support B and C sinks by 4 mm and 2.5 mm respectively

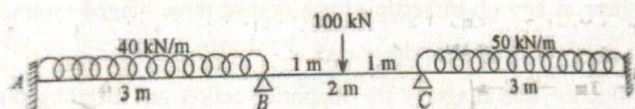
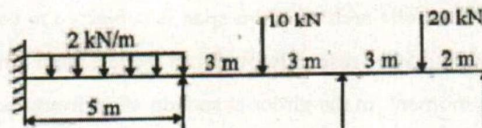


Fig. 2

- c) Draw bending moment diagram and shear force diagram for continuous beam shown in figure 3. Using moment distribution method. EI is constant.



Q4. Attempt any two of the following

2X10=20

- a) Analyse the continuous beam shown in figure 4, by moment distribution method. Also draw the bending moment diagram. Moment of inertia for AB = BC = I, CD = 2I.

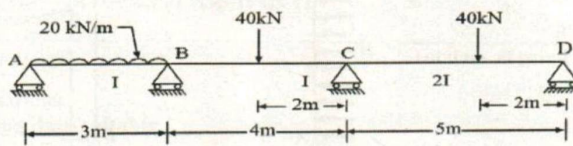


Fig 4

- b) Explain the Muller Breslan principle? Draw the influence line diagram for prop reaction in a propped cantilever beam?
c) Analyze the continuous beam shown in figure 5. by stiffness matrix method and draw BMD?

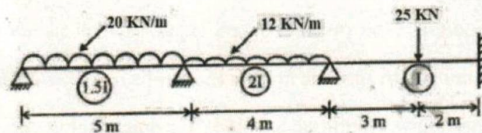


Fig. 5

Q5. Attempt any two of the following.

2X10=20

- a) Analyze the continuous beam shown in figure 6. by stiffness matrix method and draw BMD?

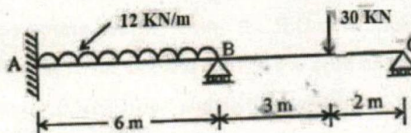


Fig. 6

- b) What is shape factor? Determine the shape factor for given section shown in figure 7?

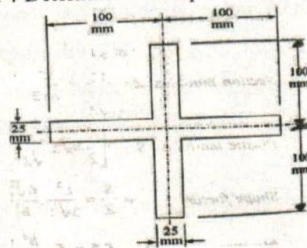


Fig. 7

P.T.O

- c) For two hinged portal frame loaded as shown in figure 8 find the value of W at collapse. Assume that the plastic moment of resistance M_p is same for all members.

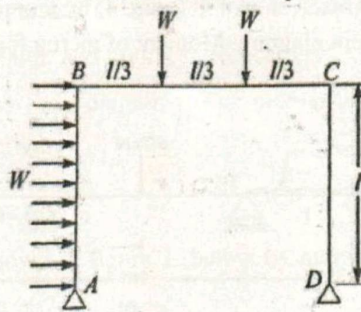


Fig. 8