

III B. Tech I Semester Supplementary Examinations, June/July-2022
STRUCTURAL ANALYSIS
 (Civil Engineering)

Time: 3 hours

Max. Marks: 75

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

UNIT-I

1. A horizontal cantilever of 6 meters span carries a point load of 50 kN at 3 meters from fixed end. If the beam is propped at the free end to the level of the fixed end [15M]
 (a) find the load of the prop (b) construct S.F and B.M. diagrams.
- (OR)
2. In the fixed beam AB shown in Fig.1, find the fixed end moments. [15M]
 Draw the bending moment diagram.

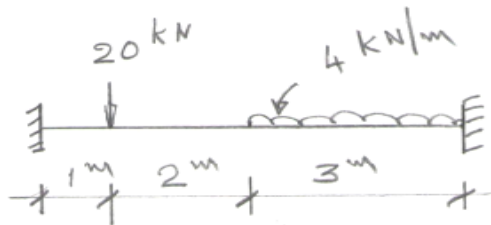


Fig.1

UNIT-II

3. A continuous beam ABCD 18 m long is simply supported at A, B, D and hinged at C by slope and deflection method. It consists of spans AB, BC and CD of length 6 m. It carries a point load of 80 kN on span AB at a distance 2 m from A, a load of 10 kN/m on the span 'BC' distributed uniformly. A load of 50 kN on span CD at a distance 3 m from B. Find B.M and S.F diagram. [15M]
- (OR)
4. Analyze the beam ABCD loaded as shown in Fig.2 by using the moment distribution method. If support B yields by 9 mm, $EI = 1 \times 10^{12}$ N-mm² throughout. Draw the BMD. [15M]



Fig.2



UNIT-III

5. For the truss shown in Fig.3 Evaluate the forces in the members BC, CE and EF. Use method of sections. [15M]

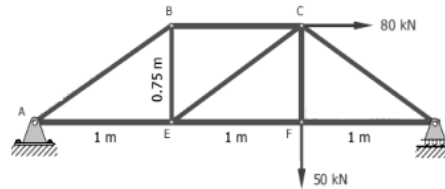


Fig.3

(OR)

6. Find the forces in the members of the truss shown in Fig.4 by method of joints. [15M]

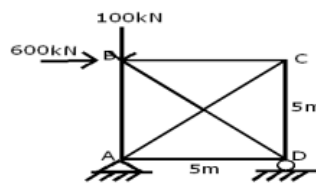


Fig.4

UNIT-IV

7. Four point loads 8 kN, 15kN, 15 kN and 10 kN have center to center spacing of 2 m between consecutive loads and they traverse a girder of 30 m span from left to right with 10 kN load leading. Calculate the maximum bending moment and shear force at 8 m from the left support. [15M]

(OR)

8. Two wheel loads of 18 kN and 12 kN acting at a fixed distance of 4 m between them cross a beam of span 10 m. Draw the influence lines for shear force and bending moment for a point 2 m from the left support. Hence find the maximum shear force and bending moment values at the section. [15M]

UNIT-V

9. A three span continuous beam ABCD hinged at A and continuous at B, C and D, carries a uniformly distributed load of 10 kN/m, 15 kN/m and 20 kN/m over spans AB, BC and CD. The length of beam AB is 3m. The length of beams and moment of inertias are in the ratio of AB:BC:CD = 1:2:2. Analyze the beam using stiffness method and draw the bending moment diagram. [15M]

(OR)

10. Analyze the continuous beam shown in Fig.5 by stiffness method. Assume uniform flexural-rigidity of beam AB and BC. $EI = 12 \times 10^{11}$ N-mm². [15M]

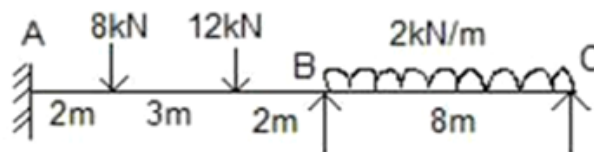


Fig.5

