

Code No: 126DZ

**R13**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech III Year I Semester Examinations, May - 2017

STRUCTURAL ANALYSIS - II

(Common to CE, CEE)

Time: 3 hours

Max. Marks: 75

**Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

**PART - A**

(25 Marks)

- 1.a) Define Carryover factor and rotation factor. [2]
- b) Calculate the distribution factors at the joints of the frame shown below figure 1. [3]

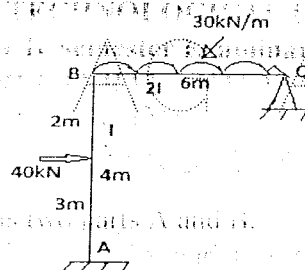


Figure 1

- c) What is the effect of rib shortening in two hinged arch. [2]
- d) Draw elastic curve and bending moment diagram for the Frame shown in Figure 2. [3]

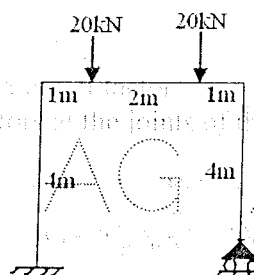


Figure 2

- e) What are the assumptions made in the portal method? [2]
- f) Draw the axial force, shear force and bending moment diagrams (qualitatively) of the frame loaded as shown below figure 3. [3]

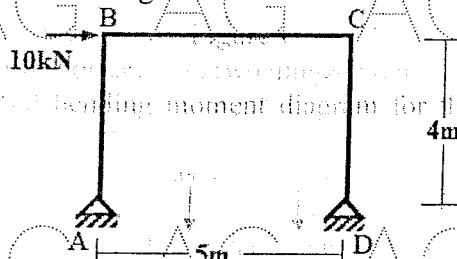


Figure 3

- g) Define Stiffness and Flexibility. [2]  
h) Differentiate static and kinematic indeterminacy of structure, what is the SI and KI of the beam shown below figure 4. [3]

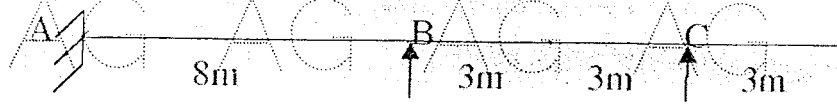


Figure 4

- i) What is the static indeterminacy of truss shown figure 5 below: [2]

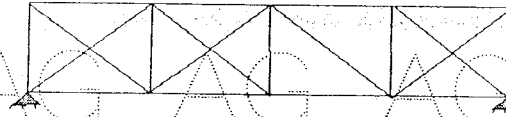


Figure 5

- j) Draw ILD (Qualitatively) for the continuous beam shown in Figure 6 below. [3]



Figure 6

### PART - B

(50 Marks)

2. Analyze the continuous beam shown in figure 7 by Kani's method and draw BMD. [10]

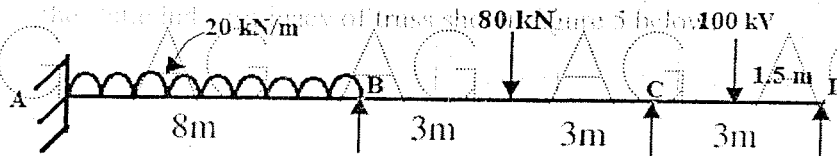


Figure 7

OR

3. Analyze the portal frame shown below figure 8 by moment distribution method. [10]

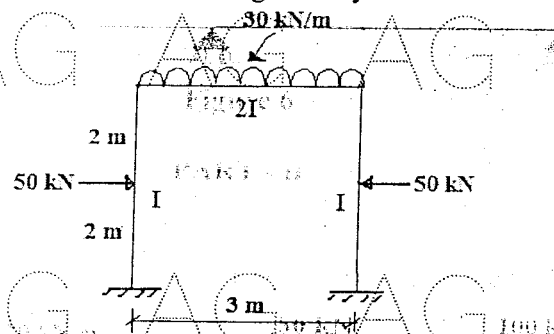


Figure 8

4. A two hinged parabolic arch has a span of 35m and a central rise of 7m. Calculate the bending moment, radial shear and normal thrust at a section distant 10m from the left hinge, due to a single point load of 6kN acting at 12m from the right support. [10]

5. Analyze the portal frame shown in figure 9 by slope-deflection method. [10]

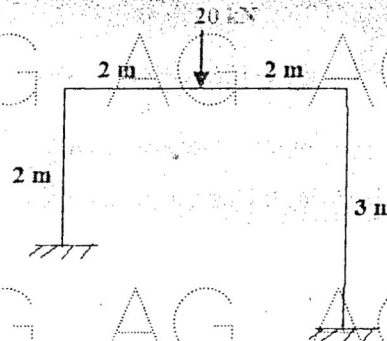


Figure 9

6. Analyze the frame shown in Figure 10 using portal method. [10]

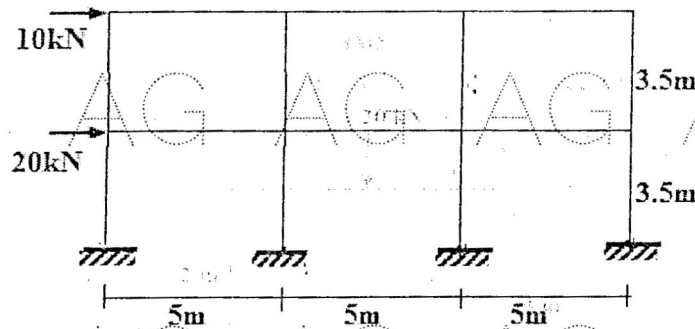


Figure-10

7. Analyze the building frame shown in Figure 11 below by cantilever method. [10]

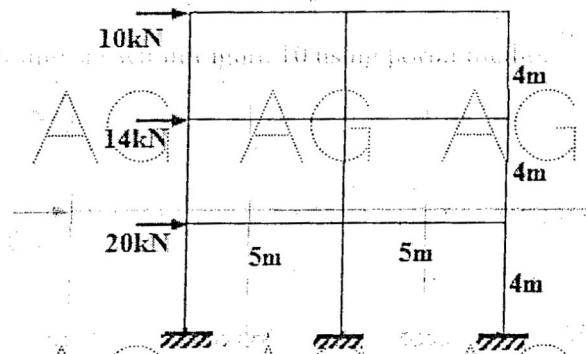


Figure 11

7. Analyze the building frame shown in Figure 11 below by cantilever method. [10]

8. Analyze the continuous beam shown in Figure 12 using Flexibility method and draw the Bending moment diagram. [10]

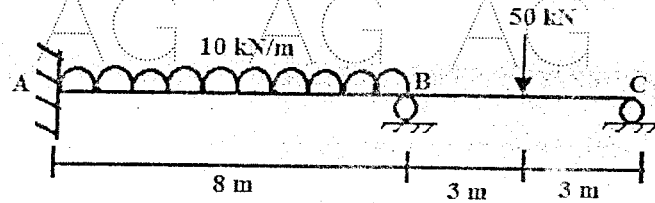


Figure 12

- OR
9. Analyze the frame by stiffness matrix method, and draw BMD, take  $EI$  as constant. (Figure 13) [10]

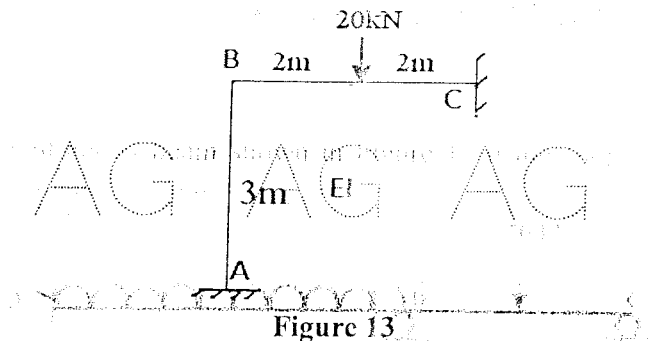


Figure 13

10. Draw the influence line for moment at 'B'  $M_B$  for the two span continuous beam ABC simply supported at A and C,  $AB=4m$ ,  $BC=5m$ .  $EI$  is constant. [10]

OR

11. A truss is loaded as shown in figure 14. All the members of the truss have same cross sectional area. Find the axial force in the member BC and DE. [10]

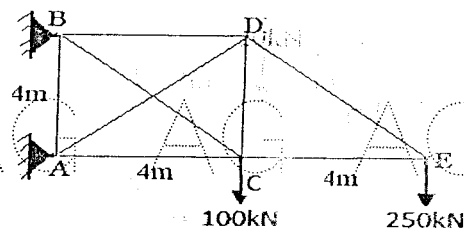


Figure 14

Figure 13