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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech III Year II Semester Examinations, May - 2016
STRUCTRUAL 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) Distinguish between the joint stiffness factor and the modified stiffness factor. [2]
  b) Define the carry-over factor and obtain the carry-over factor for a beam of prismatic
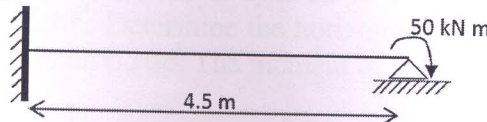   member shown in Fig. 1. [3]

Fig. 1

  c) Define kinematic degrees of freedom with two examples. [2]
  d) A two hinged parabolic arch of span 'L' and central rise 'H' is subjected to uniformly
     distributed load 'w/m' over its entire span. Determine the horizontal thrust. [3]
  e) What is a substitute frame? [2]
  f) Explain the cantilever method of frame analysis. [3]
  g) Distinguish between static and kinematic indeterminacy. [2]
  h) Explain the procedure of stiffness method of analysis. [3]
  i) Differentiate between the internal and external indeterminacies. [2]
  j) Draw the ILD for the support moment at the fixed support of a propped cantilever
     beam. [3]

PART - B (50 Marks)

2. Using moment distribution method, analyse the frame supported and loaded as shown
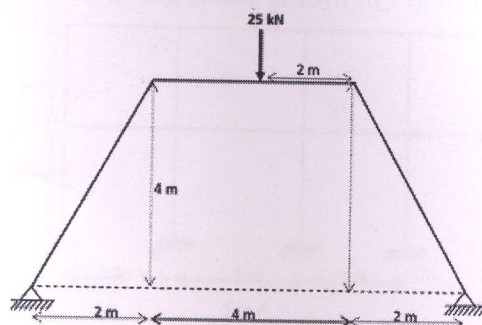   in Fig.2. Draw BMD. [10]

Fig.2

OR

3. Analyse the frame shown in Fig.3 by Kani's method. Draw BMD and elastic curve.[10]
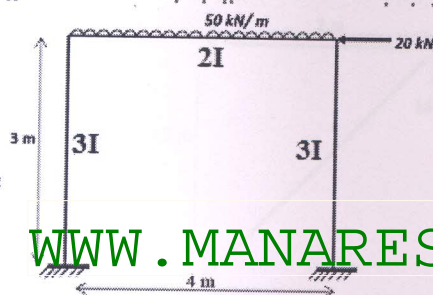

Fig.3

Analyse the frame shown in Fig.4, by Slope-deflection method. Assume the constant flexural rigidity. Draw BMD. [10]
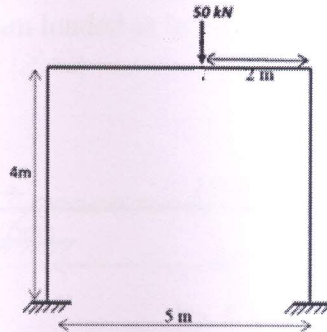

Fig.4

OR

5. A two hinged steel parabolic arch of span 30 m and central rise 6 m is subjected to a rise of temperature of 30^0. Determine the horizontal thrust developed in the arch. Also find the change in the central rise. The moment of inertia of the arch at the crown is 125×10^8 mm^4.
Adopt $E = 2 \times 10^5$ N/mm^2 and $\alpha = 12 \times 10^{-6}/{}^0C$. [10]

6. Analyse the frame shown in Fig.5, using cantilever method. Draw BMD. [10]
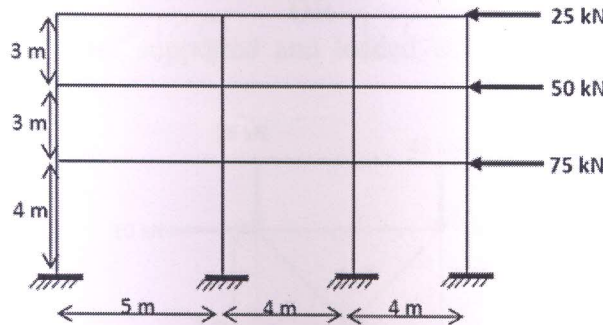

Fig.5

OR

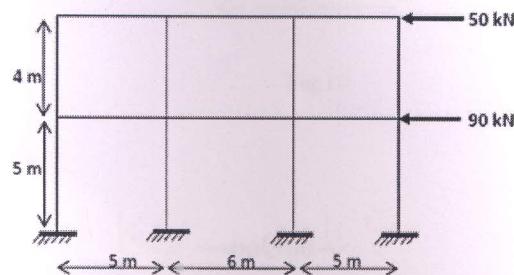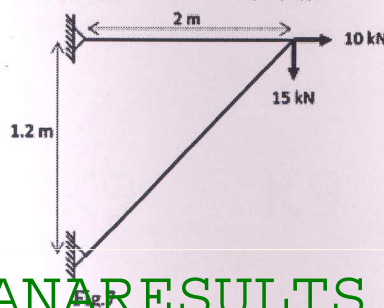7. Using portal method, analyse the frame shown in Fig.6. Draw BMD. [10]

Fig.6

8. Analyse the plane truss supported and loaded as shown in Fig.7. Adopt the cross-sectional area of each member is 1200 mm^2 and modulus of elasticity is 200 kN/mm^2. [10]

OR

Analyse the continuous beam loaded as in Fig. 8 by flexibility method. Draw BMD and elastic curve. [10]
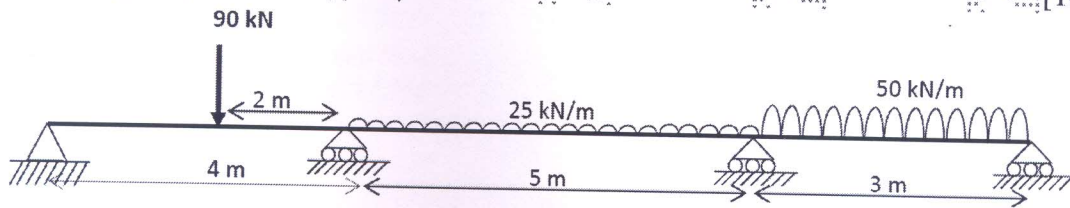

Fig. 8

10. Draw the influence line diagram for the bending moment at the section X-X of a beam supported as shown in Fig. 9. [10]
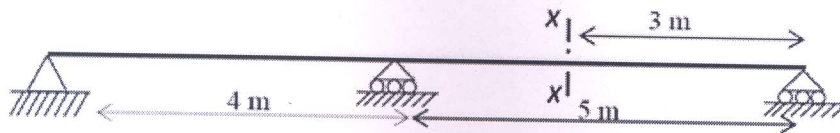

Fig. 9

OR

11. Analyse the plane truss supported and loaded as shown in Fig.10. Assume AE is constant. [10]
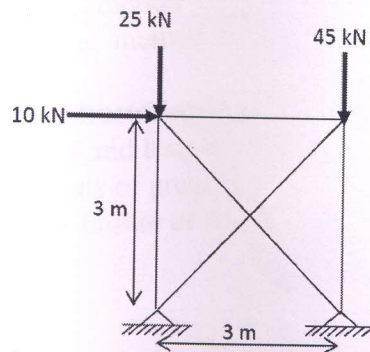

Fig.10

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