Code No. 6082 / S

FACULTY OF ENGINEERING

B.E. 3/4 (Civil) I - Semester (Suppl.) Examination, July 2014

Subject : Theory of Structures – I

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1 What is the static indeterminacy of a simply supported truss having six joints and ten members? (2)

2 The number of simultaneous equations to be solved in slope deflection method is equal to
(a) Static indeterminacy (b) Kinematic indeterminacy
(c) Number of joints (d) Number of members (2)

3 Define carryover factor and distribution factor. (2)

4 List the advantages of Kani's method. (2)

5 State Castigliano's of theorem I & II. (2)

6 Explain shear flow and sketch shear flow across the depth of an I-section. (3)

7 Write equilibrium equations for a portal frame of unequal column heights subjected to a u.d.l. on the beam. (3)

8 Derive stiffness factor for a beam with far end fixed. (3)

9 Mention the causes of sway in single bay single storey portal frames with sketches. (3)

10 Using strain energy method, determine the maximum deflection in a cantilever subjected to u.d.l. over the entire length. (3)

PART – B (50 Marks)

11 Analyse the continuous beam show in figure 1 by moment distribution method and draw B.M.D. Support B sinks by 2.5 mm. I = 3.5 x 10^7 mm^4 and E = 200 kN/mm^2. (10)

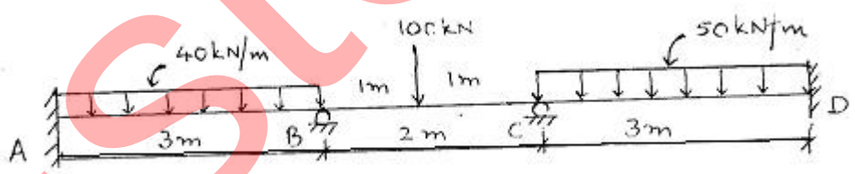

Figure 1

12 Analyse the beam shown in figure 2 by slope deflection method and draw B.M.D. EI is constant. (10)

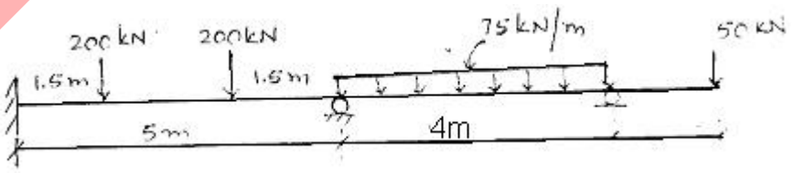

Figure 2

13 Draw B.M.D. for the beam show in figure 3 using Kani's method. (10)

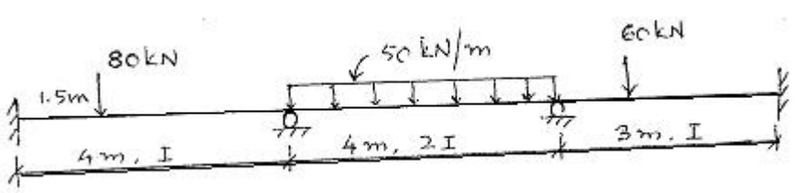

Figure 3

....2

14 Analyse the portal frame shown in figure 4 and draw B.M.D. (10)

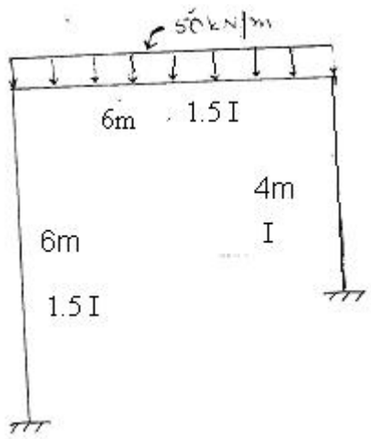

Figure 4

15 Determine the vertical deflection at joint F of the truss shown in figure 5. $A = 2200\ mm^2$ and E=200 GPa. (10)

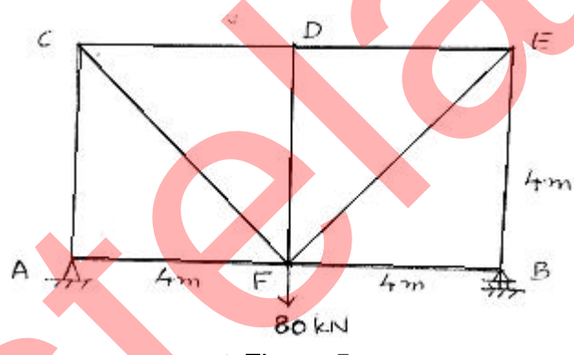

Figure 5

16 Analyse the truss show in figure 6. All the members have same axial rigidity. (10)

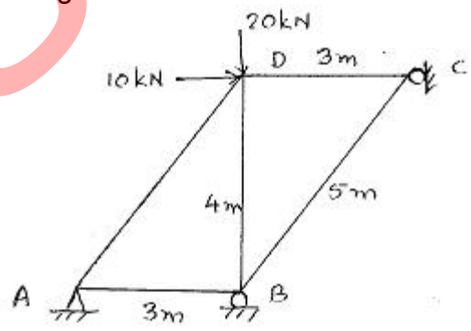

Figure 6

17 Locate the shear center for the cross section shown in figure 7. (10)

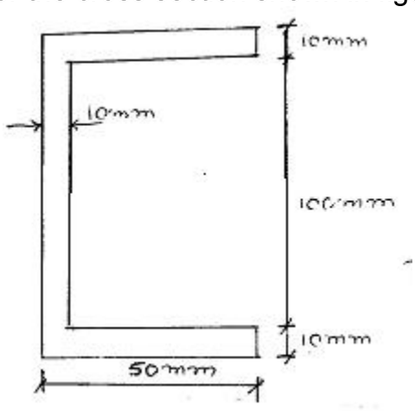

Figure 7

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