B.E/B.Tech(Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2012

CIVIL ENGINEERING

V SEMESTER (Regulations 2008)

CE 9301 STRUCTURAL ANALYSIS I

Time : 3 Hours Max.Marks: 100

Answer ALL questions

Part-A (10x2=20 marks)

1. What is Williot diagram?
2. What is the slope at free end of a cantilever beam of span 1m carrying a moment 10 kNm at free end? EI=50000kNm^2.
3. Compute the flexibility matrix for the given stiffness matrix below.

$$[K]= \begin{bmatrix} 8 & -1 \\ -1 & 4 \end{bmatrix}$$

4. What is a primary structure? Give examples.
5. Give any two examples each of symmetry and anti-symmetry rigid frames.
6. Write down the slope deflection equation for a beam AB fixed at A and B subjected to a settlement δ at B.
7. What do you mean sway correction?
8. What is distribution factor? Explain.
9. Write down the stiffness matrix for a cantilever beam of span L and flexural rigidity EI considering the degrees of freedom at the free end .
10. Give rotation matrix for beam element?.

Part-B (5x16=80 marks)

11. Analyse the frame shown in Fig.Q11 using stiffness matrix method. EI=Constant.

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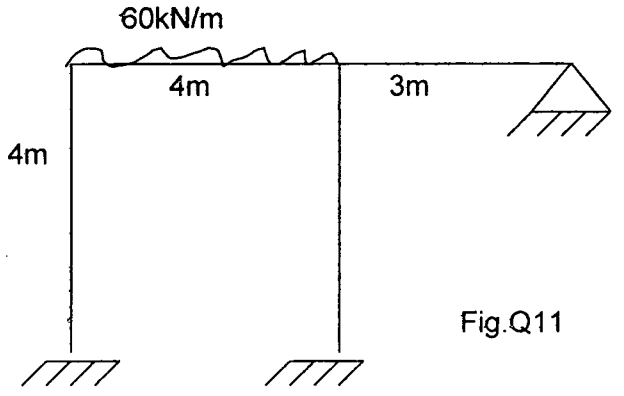

Fig.Q11

12a Determine horizontal and vertical deflections of joint C as shown in Fig.Q12a. E=200kN/mm^2 and A=1000mm^2 for all the members.

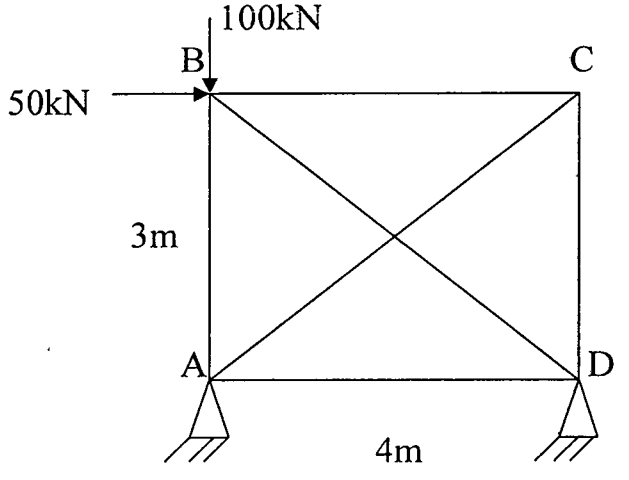

Fig.Q12a

(OR)

b. Determine the slope and deflection at C of the frame shown in Fig.Q12b. EI=40000kNm^2.

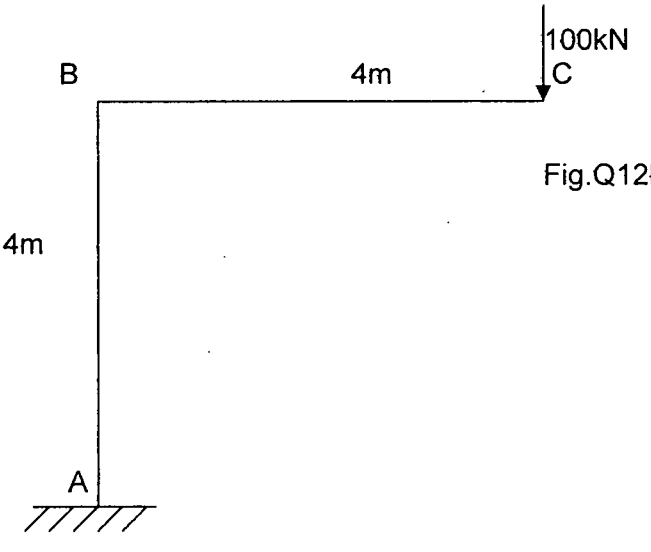

Fig.Q12b.

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13a Using slope deflection method analyse the beam shown in Fig.Q13a and draw the BMD.

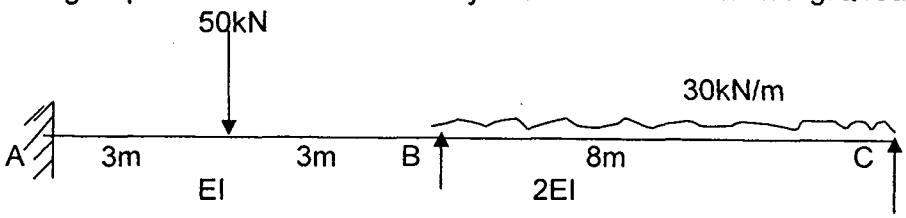

Fig.Q13a

OR

b. Analyse the frame shown Fig.Q13b. by slope-deflection method. EI=Constant.

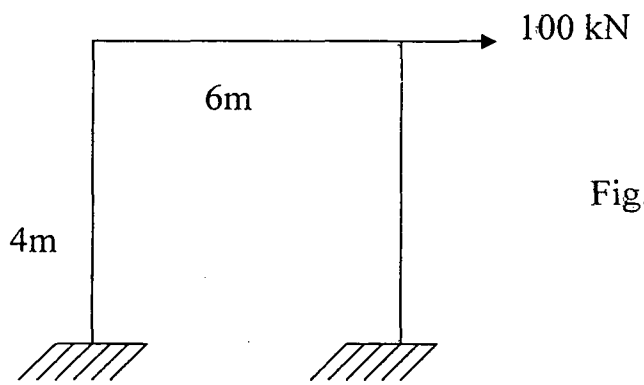

Fig.Q13b

14a Analyse the frame shown Fig.Q14a. by moment distribution method and draw SFD and BMD. EI=Constant.

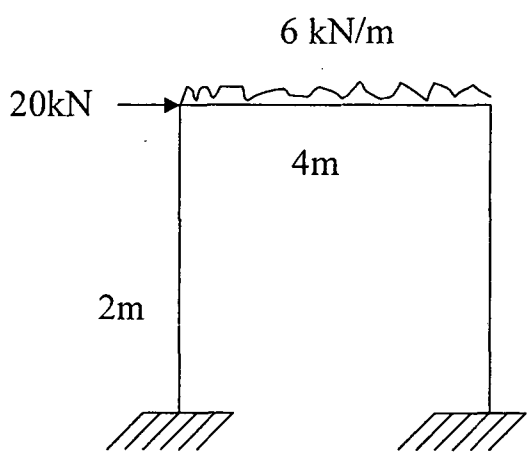

Fig.Q14a

OR

b Analyse the frame shown in Fig.Q14b by moment distribution method and draw the SFD and BMD.

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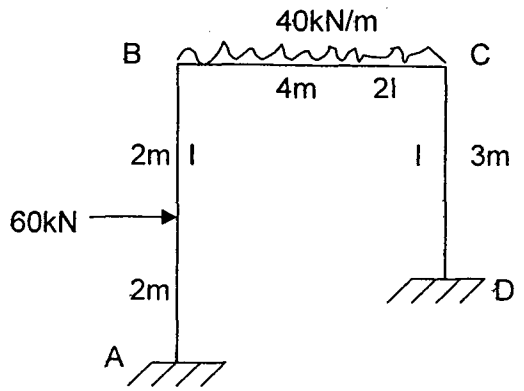

Fig.Q14b

15a Analyse the frame shown in Fig.Q15a by flexibility matrix method and draw the SFD and BMD. EI=Constant

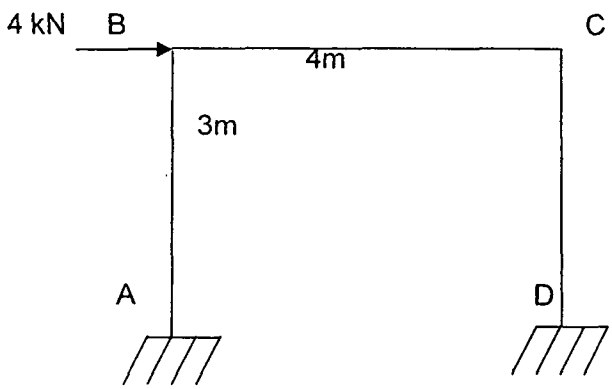

Fig.Q15a

OR

b Analyse the beam shown in Fig.Q15b using flexibility method. EI=Constant.

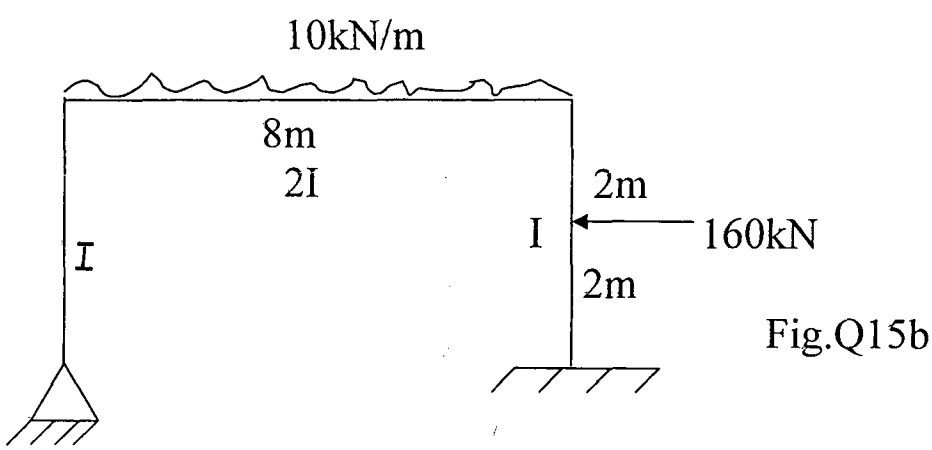

Fig.Q15b

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