Roll No. | | | | | | | | | | |

B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, April / May 2014

CIVIL ENGINEERING BRANCH

V Semester

CE 371/ CE9301 & STRUCTURAL ANALYSIS - I

(Regulation 2004/2008)

Time: 3 Hours | Answer ALL Questions | Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Define: Compatibility condition
2. State: Principle of virtual work
3. State the limitations of flexibility method.
4. What is called the primary structure?
5. Why is slope deflection method known as stiffness method?
6. Compare moment distribution method with slope deflection method.
7. What is meant by Carry over?
8. What is meant by relative stiffness of a member?
9. Define: Global stiffness matrix
10. Give the stiffness matrix for a 2D beam element

Part – B (5 x 16 = 80 marks)

11. Using the method of virtual work, find the horizontal deflection of the free end of the frame shown in Figure Q 11. Given E = 200 kN/mm^2; I = 40 x 10^6 mm^4.

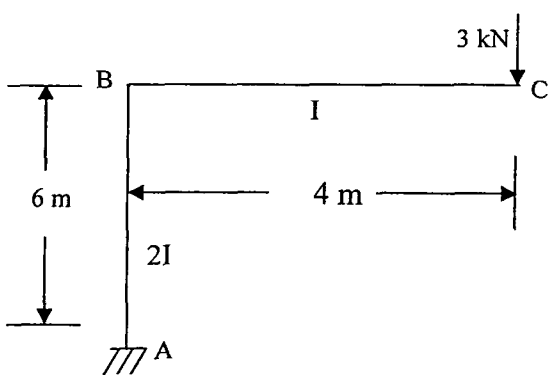

Figure. Q11

12. a Determine the forces in the truss shown in Figure Q12.a by matrix flexibility method. All the members have same axial rigidity.

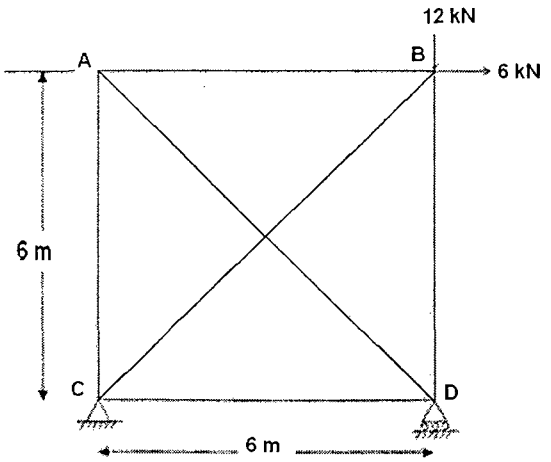

Figure. Q12.a

(OR)

b) Analyse the continuous beam shown in Figure Q 12.b. Assume EI as uniform. Use matrix flexibility method.

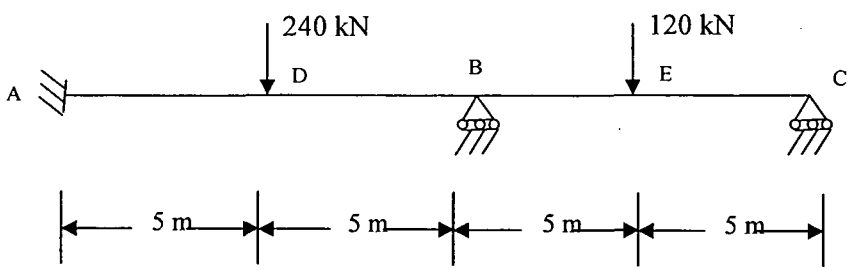

Figure. Q12.b

13. a) A continuous beam is shown in Figure Q 13.a. The support B sinks by 12 mm. Using slope deflection method, calculate the support moment and draw bending moment diagram. Given EI = 6100 kN-m^2

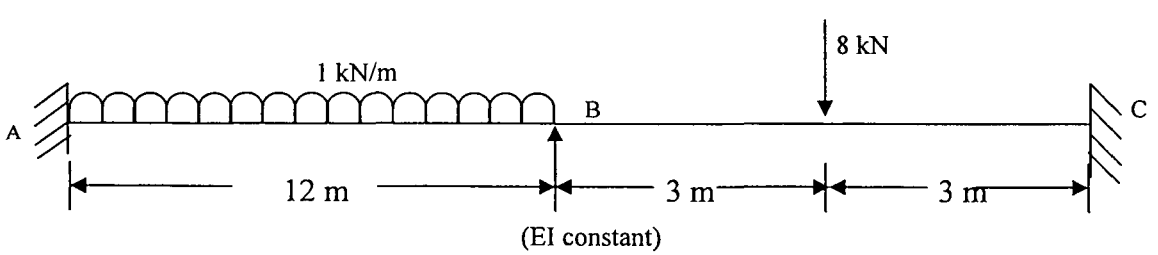

Figure. Q13.a

(OR)

b) Analyse the rigid frame as shown in Figure Q13.b using slope deflection method and draw the bending moment diagram. The moment of inertia is same for all the members.

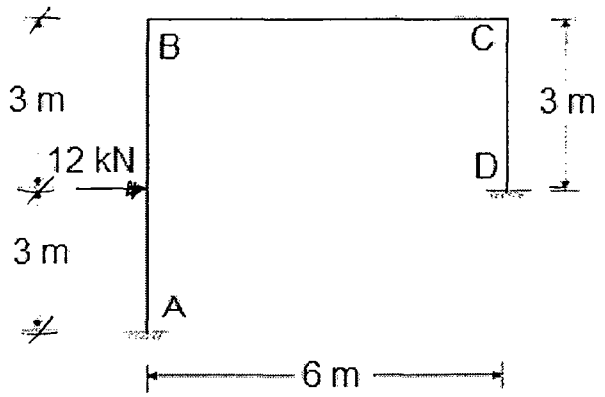

Figure. Q13.b

14 a) Analyse the portal frame with fixed base shown in Figure.Q14.a using moment distribution method, given $I_{AB} = 2I_0$; $I_{BC} = I_0$; $I_{CD} = 2I_0$.

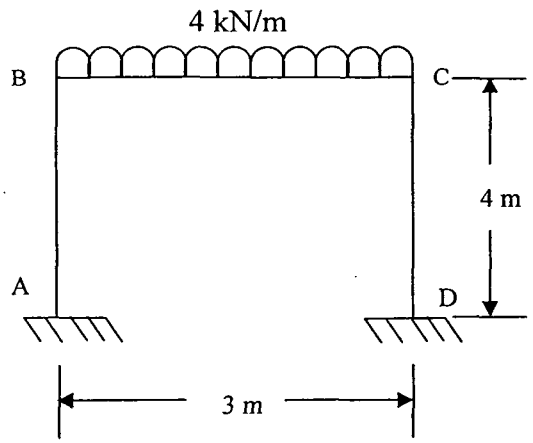

Figure. Q14.a

(OR)

b) Analyse the frame shown in Figure Q14.b by the method of moment distribution. Draw the bending moment diagram.

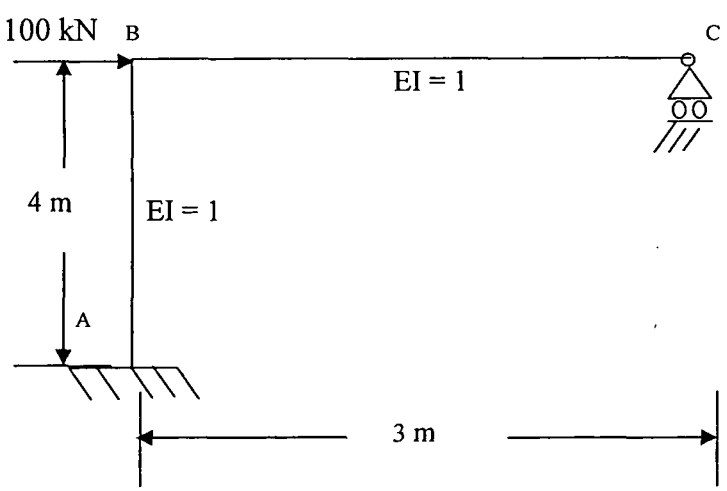

Fig. Q14.b

15. a) Find the axial forces in all members of the truss shown in the Figure Q 15.a. Each member has a length L and axial rigidity EA.

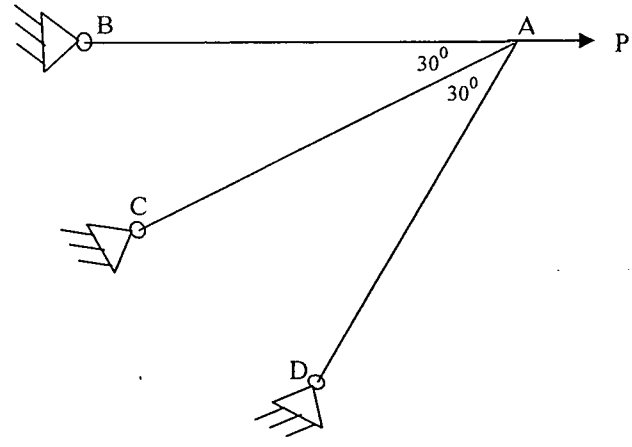

Figure. Q15.a

(OR)

b) Analyse the continuous beam shown in Figure Q 15.b and draw the BMD. Assume EI as uniform. Use Direct stiffness method.

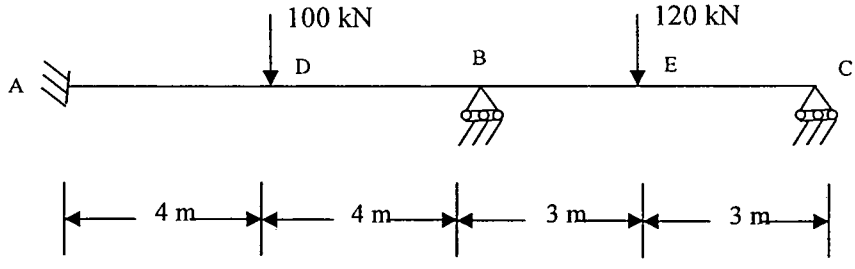

Figure. Q15.b