Reg. No. : | | | | | | | | | | |

Question Paper Code: 31154

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Fifth Semester

Civil Engineering

01UCE504 – STRUCTURAL ANALYSIS - I

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

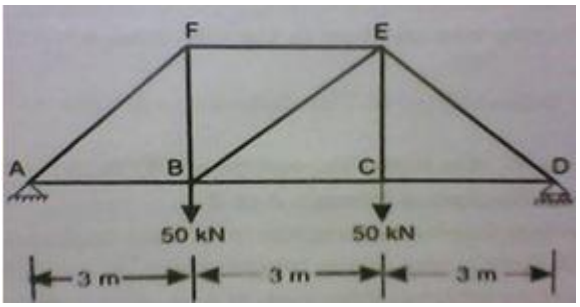
PART A - (10 x 2 = 20 Marks)

1. Equation that is used for the determination of deflection at a given point i in Beams and frames.
2. Define Virtual work.
3. Describe the basic assumption made in slope deflection method.
4. What are the quantities in terms of which the unknown moments are expressed in slope deflection method?
5. Define carry over factor and relative stiffness.
6. What are the advantages of continuous beams over simply supported beams?
7. Mention any three reasons due to which sway may occur in portal frames.
8. Define equivalent joint load forces.
9. Define degree of freedom?
10. Differentiate global axis and local axis.

PART - B (5 x 16 = 80 Marks)

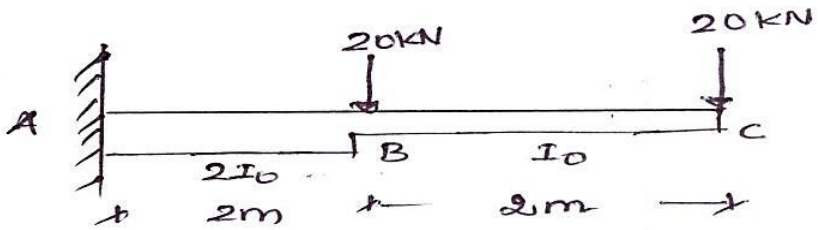
11. (a) Determine the vertical displacement of joint C of the steel truss shown in figure. The cross sectional area of each member is A = 400 mm2 and E = 2 x10^5 N/mm^2.

(16)



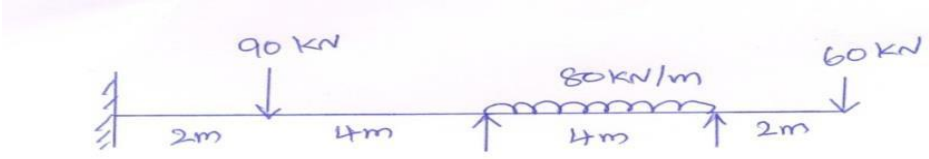
Or

(b) Determine the deflection and rotation at the free end of the cantilever beam shown in figure Use unit load method. Given E=2x105 and I=12x10^{6}mm^4.



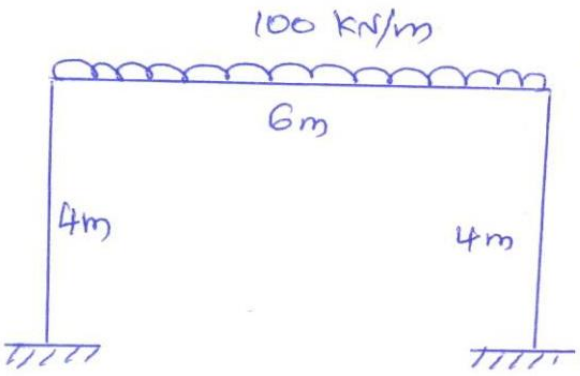
(16)

12. (a) Analysis the given continuous beam shown in figure and draw its BMD and SFD using slope deflection method. EI=Constant. (16)

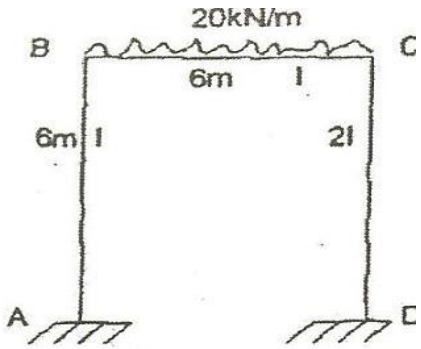


Or

(b) Analyze the portal frame shown in figure by slope deflection method. (16)

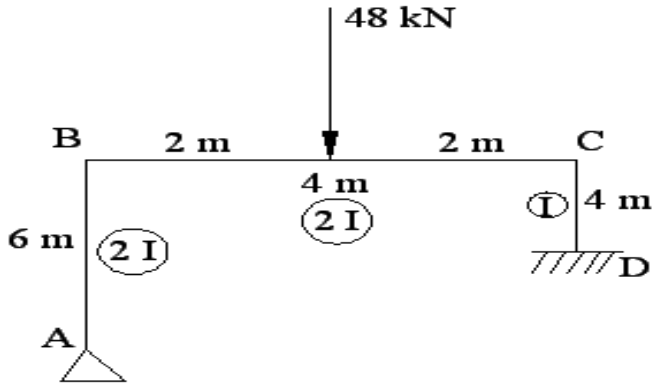


13. (a) Analyze the frame shown in figure By moment distribution method and draw the SFD and BMD. (16)

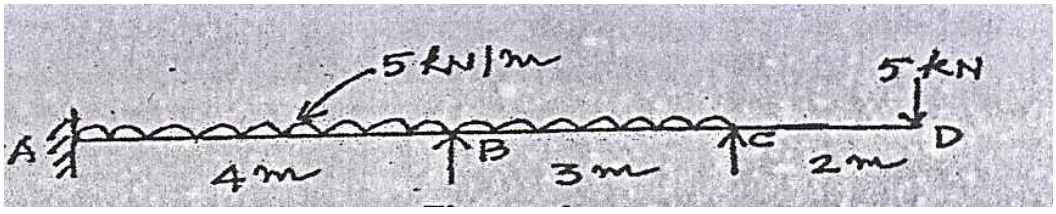


Or

(b) Analysis the frame as shown in figure using moment distribution method and draw BMD. (16)

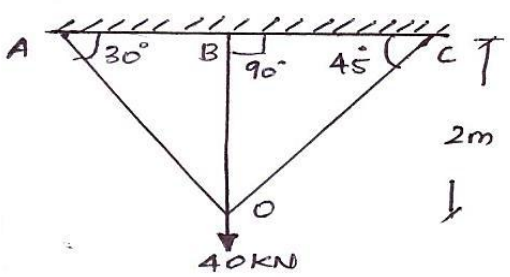


14. (a) Apply the continuous beam ABCD shown in figure by Flexibility matrix method. Take EI=Constant. Also sketch the shear force and Bending Moment diagram. (16)



Or

(b) Analyze the pin jointed plane trusses shown in figure. By Flexibility matrix method. (16)



15. (a) A continuous beam ABC consist of span AB=3m and BC=4m, the ends A and C being fixed. AB and BC carries uniformly distributed loads of intensity 4kN/m and 5kN/m respectively. Find the support moments by stiffness matrix method and draw the bending moment diagram for the beam. The beam is of uniform section throughout. (16)

Or

(b) Write down the steps in analyzing a beam or frame using matrix stiffness method. (16)