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**Question Paper Code: 35104**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Fifth Semester

Civil Engineering

01UCE504 – STRUCTURAL ANALYSIS - I

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

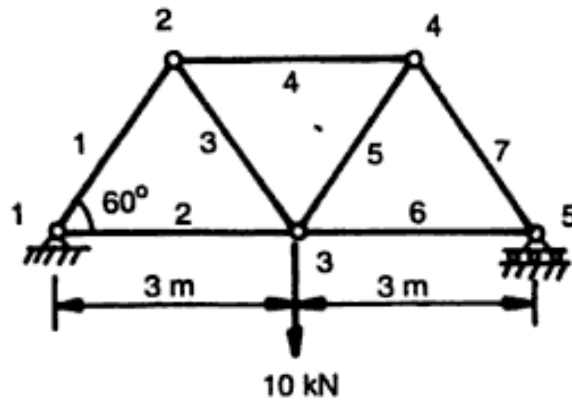
Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. State principle of virtual work.
2. Differentiate determinate and indeterminate structures.
3. Describe the basic assumption made in slope deflection method.
4. What are the assumptions made in slope-deflection method?
5. Define Carry over factor.
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 flexibility influence coefficient.
9. What is the displacement transformation matrix?
10. List the properties of the stiffness matrix.

PART - B (5 x 16 = 80 Marks)

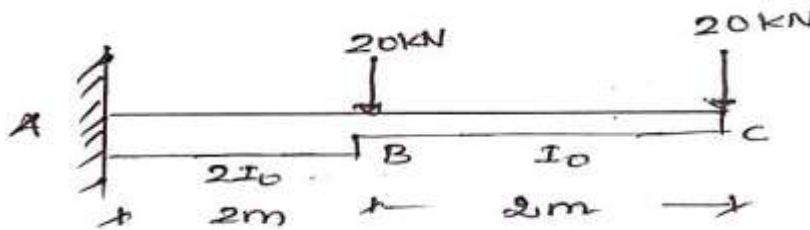
11. (a) Determine the vertical and horizontal deflection of joint 4 for the truss shown in below figure.  $L=3\text{ m}$ ,  $A= 500 \times 10^{-6}\text{ m}^4$  and  $E = 200 \times 10^6\text{ kN/m}^2$  are constant for all members.



(16)

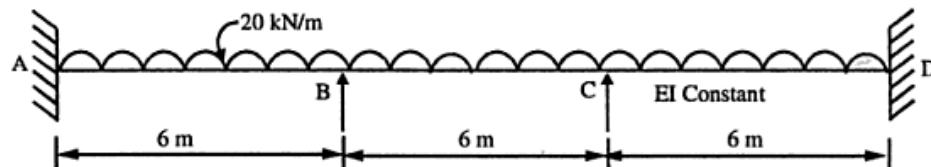
Or

- (b) Determine the deflection and rotation at the free end of the cantilever beam shown in figure Use unit load method. Given  $E=2 \times 10^5$  and  $I=12 \times 10^6\text{ mm}^4$ .



(16)

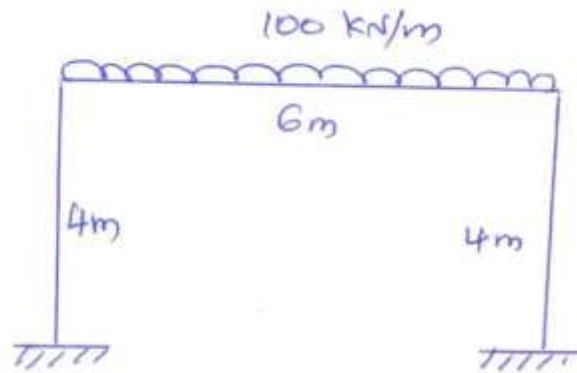
12. (a) Analyze the beam shown in below figure by slope deflection method and draw the bending moment diagram.



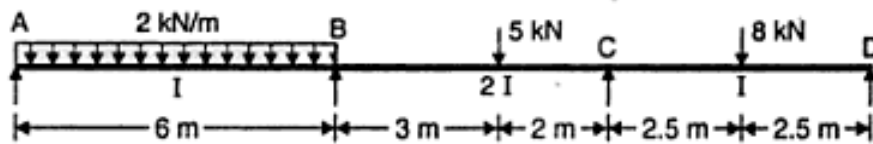
(16)

Or

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



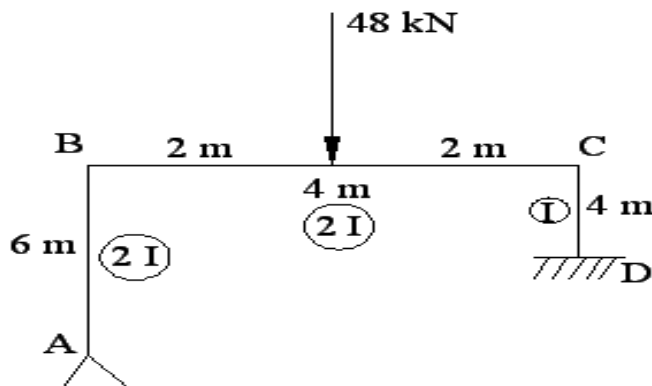
13. (a) Analyze the frame shown in below figure by moment distribution method and draw the BMD.



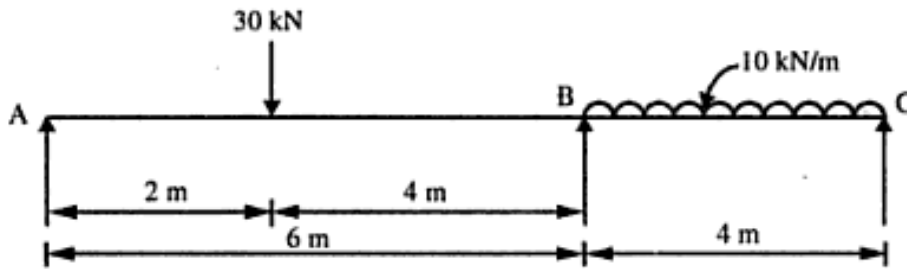
(16)

Or

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



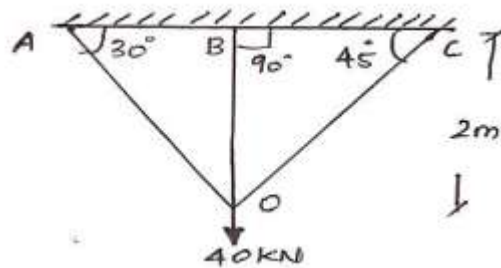
14. (a) Analyze the continuous beam shown in below figure by flexibility method and draw bending moment diagram.



(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  $AB=3\text{m}$  and  $BC=4\text{m}$ , the ends A and C being fixed. AB and BC carries uniformly distributed loads of intensity  $4\text{kN/m}$  and  $5\text{kN/m}$  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)