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

Question Paper Code : 91304

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019
Fifth Semester
Civil Engineering
CE 6501 – STRUCTURAL ANALYSIS – I
(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions.

PART – A **(10×2=20 Marks)**

1. Distinguish between static indeterminacy and kinematic indeterminacy.
2. Brief the method of consistent deformation for the analysis of a propped cantilever.
3. Sketch qualitatively the influence line for shear at D for the beam in Fig. Q. No. 3.

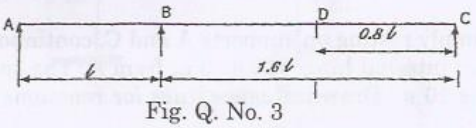


Fig. Q. No. 3

4. Draw the influence line for shear to the left of B for the overhanging beam shown in Fig. Q. No. 4.

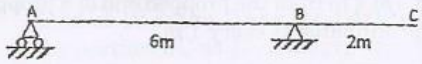


Fig. Q. No. 4

5. What is the value of horizontal thrust at the supports of a three hinged symmetrical parabolic arch of span "l" and central rise 'h', when it is subjected to a uniformly distributed downward load "w" per unit horizontal length over the right half span ?
6. Name any two methods available for the analysis of two hinged arches.
7. Distinguish between Sway type and Non-sway type problems.
8. Write the advantages of slope deflection method.
9. State the reasons for a portal frame to sway.
10. Specify the condition to use the Naylor's simplification in moment distribution method for the analysis of frames.

PART – B (5×13=65 Marks)

11. a) Find the forces in the members of the truss shown in figure 11(a). The cross sectional area and Young's modulus of all the members are the same.

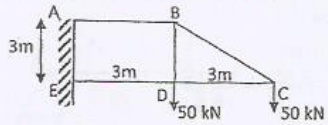


Fig. Q. No. 11 (a)

(OR)

b) Analyse the truss shown in figure 11(b) by Consistent Deformation Method. Assume that the cross sectional area of all the members are same.

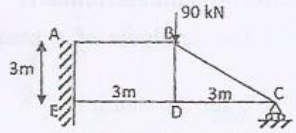


Fig. Q. No. 11 (b)

12. a) A continuous beam ABC is simply resting on supports A and C, continuous over the support B and has an internal hinge (D) at 3 m from A. The span AB is 7 m and the span BC is 10 m. Draw influence lines for reactions at A and B.

(OR)

b) Draw influence line for shearing force at 4 m from the propped end of a propped cantilever of span 7 m. Calculate the ordinates at every 1 m.

13. a) A uniformly distributed load of 6 kN/m covers the left half span of a three hinged symmetrical parabolic arch of span 24 m and central rise 4 m. Determine the horizontal thrust and also the bending moment, shearing force and normal thrust at the loaded quarter span.

(OR)

b) A symmetrical two hinged parabolic arch has a span of 50 m and central rise 5 m. It carries a concentrated vertical load of 20 kN at 10 m from left support in addition to a vertical load of 30 kN at the crown. Draw the bending moment diagram for the arch and also determine the radial shear and normal thrust at 12.5 m from the left support.

14. a) A continuous beam ABCD consists of three span and is loaded as shown in Fig. Q. No. 14 (a). Analyze the beam by using slope deflection method. E is constant throughout.

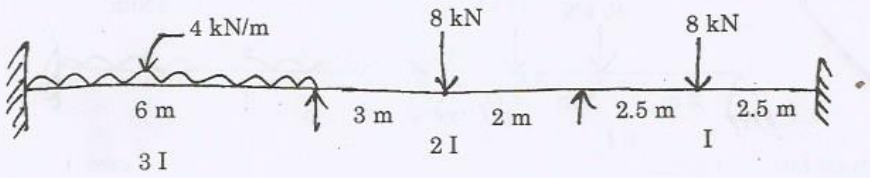


Fig. Q. No. 14 (a)

(OR)

b) Analyse the frame shown in Fig. Q. 14 (b) by slope deflection method.

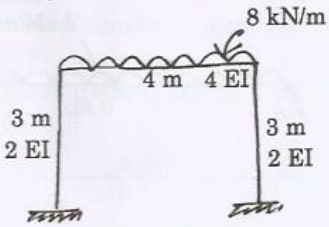


Fig. Q. No. 14 (b)

15. a) A continuous beam ABC is simply supported at A, fixed at C and continuous over support B. The span AB is 6 m and carries a concentrated load of 60 kN at its mid-span and the span BC is 8 m and carries a uniformly distributed load of 10 kN/m. Take the flexural rigidity for portion AB as 2EI and that for portion BC as EI. Analyze the beam by moment distribution method and draw the shearing force and bending moment diagrams.

(OR)

b) Analyze the frame shown in Fig. Q. 15 (b) by moment distribution method and draw the bending moment diagram.

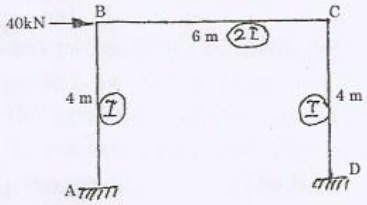
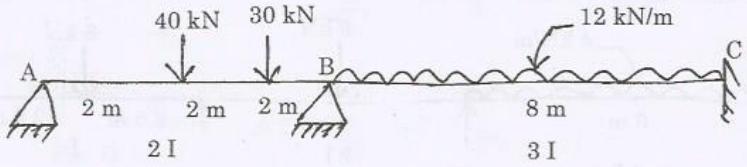


Fig. Q. No. 15 (b)

PART – C (1×15=15 Marks).

16. a) Analyse the continuous beam shown in fig. Q. No. 16 (a) and plot the BMD and SFD. Use Moment distribution method.



(OR)

b) Draw the BMD and SFD of the beam shown in fig. Q. 16 (b) by slope deflection method.