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

Question Paper Code : 27120

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

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. Calculate degree of indeterminacy of propped cantilever beam.

2. Write the difference between static and kinematic indeterminacies.

3. Sketch qualitatively the influence line for shear at D for the beam in Fig. Q.No. 3.

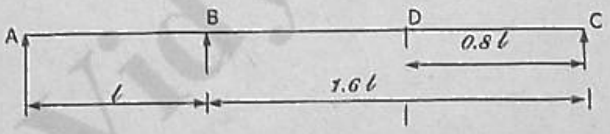

Fig. Q.No. 3

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

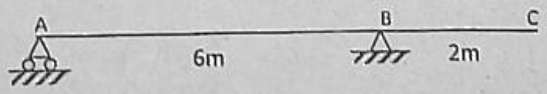

Fig. Q.No. 4

5. What are the advantages of three hinged semi circular arch?

6. What is meant by Rib Shortening?

7. Distinguish between Sway type and Non-sway type problems?

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8. Write the advantages of slope deflection method.

9. Define stiffness and carry over factor in moment distribution method.

10. What is meant by the terms :

    (a) moment distribution

    (b) distribution factor.

PART B — (5 × 16 = 80 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.

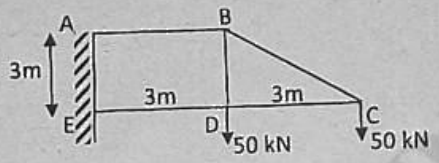

Fig. Q.No. 11 (a)

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.

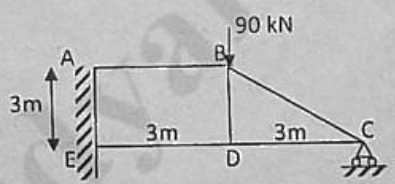

Fig. Q.No. 11 (b)

12. (a) Using Muller Breslau principle, draw the influence line for the bending moment at D, the middle point of span AB of a continuous beam shown in Fig. Q.No. 12 (a). Compute the ordinates at 1 m interval. Determine the maximum hogging bending moment in the beam when two concentrated loads of 8 kN each and separated by a distance 1 m passes though the beam from left to right.

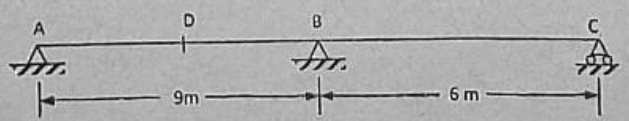

Fig. Q.No. 12 (a)

Or

(b) Draw the IL for force in member BC and CI for the truss shown in Figure Q.No. 12 (b). The height of the truss is 9 m and each segment is 9 m long.

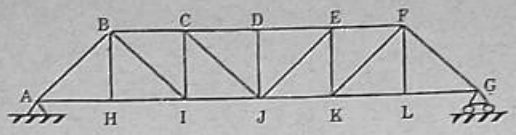

Fig. Q.No. 12 (b)

13. (a) A symmetrical three hinged circular arch has a span of 16 m and rise to the central hinge of 3.5 m as shown in Fig. Q.No. 13(a). It carries a vertical load of 16 kN at 3.5 m from the left hand end. Find :

(i) the magnitude of horizontal thrust at supports

(ii) the reactions at the supports

(iii) bending moment of 6 m from the left hand hinge and

(iv) the maximum positive and negative moment.

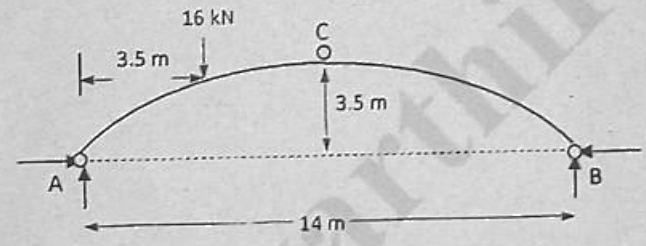

Fig. Q. No. 13 (a)

Or

(b) A parabolic 3 hinged arch shown in Fig. 13 (b) carries loads as indicated. Determine

(i) resultant reactions at the end supports

(ii) bending moment, shear (radial) and normal thrust at D, 5 m from A.

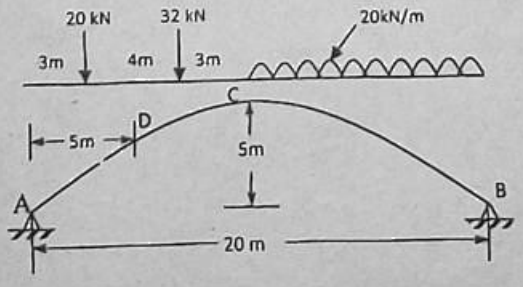

Fig. Q. No. 13 (b)

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.

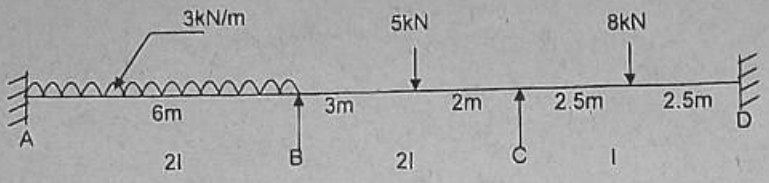

Fig. Q.No. 14(a)

Or

(b) Analyse the structures shown in Fig. Q.No. 14(b) by the slope deflection method. Sketch the bending moment and shear force diagrams.

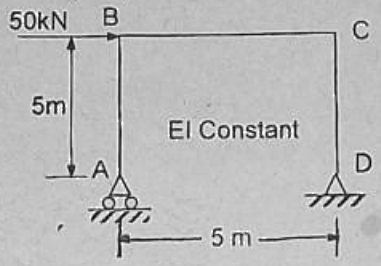

Fig. Q.No. 14 (b)

15. (a) Analyse the portal frame shown in Fig. Q.No. 15(a) using moment distribution method.

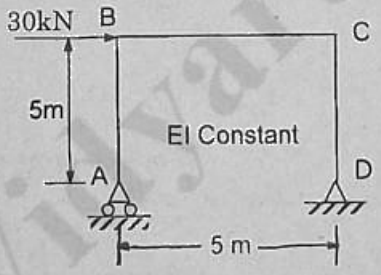

Fig. Q.No. 15 (a)

Or

(b) Analyse the continuous beam shown in Fig. Q.No. 15 (b) using moment Distribution Method.

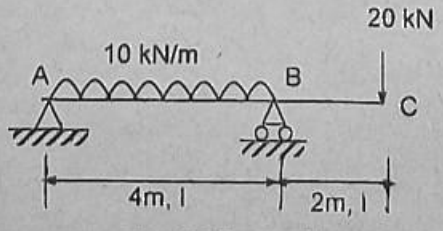

Fig. Q.No. 15 (b)

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