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Reg. No. :

Question Paper Code : 50279

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017
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. Define static indeterminacy.
3. What are the uses of influence lines ?
4. What is meant by Begg's deformeter ?
5. What are the advantages of three hinged semi circular arch ?
6. How do you do account settlement effects in arches ?
7. Distinguish between Sway type and Non-sway type problems.
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 term Carry over factor ?

PART – B (5×13=65 Marks)

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

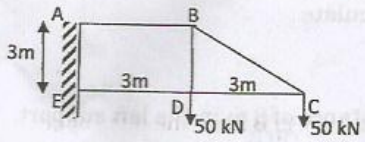

Fig.Q. No. 11.a.

(OR)

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b) Analyse the truss shown in Figure Q. 11 (b) by consistent deformation method. Assume that the cross sectional area of all the members are same.

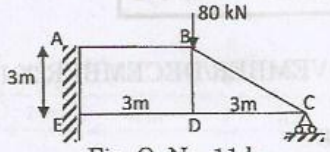

Fig. Q. No. 11.b.

12. a) Using Muller Breslau principle, draw the influence line for the bending moment at D, the middle point of span BC 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 6kN each and separated by a distance 1 m passes through the beam from left to right.

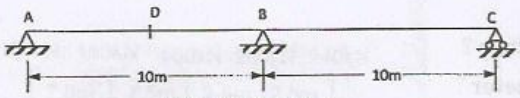

Fig. Q. No.12. a.

(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 8 m and each segment is 8 m long.

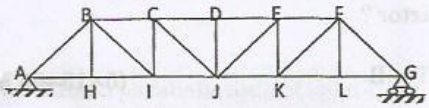

Fig. Q. No.12. b.

13. a) A symmetrical three hinged parabolic arch of span 30 m and rise 8 m carries an UDL of 40 kN/m over the left half of the span. The hinges are provided at the supports and at the center of the arch. Calculate :
   a) Reactions of the supports.
   b) Bending moment.
   c) Radial shear and normal thrust at a distance of 8 m in the left support.

(OR)

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b) A three hinged arch is circular, 25 m in span with a central rise of 5 m. It is loaded with a concentrated load of 10 kN at 7.5 m from the left hand hinge. Find the (a) Horizontal thrust. (b) Reaction at each end hinge. (c) Bending moment under the load.

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.

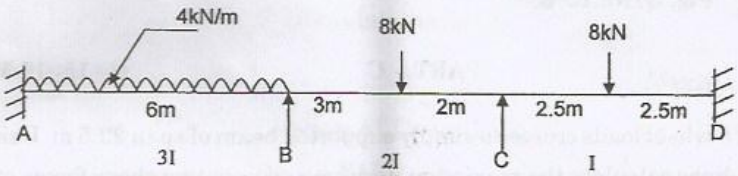

Fig. Q. No.14. a.

(OR)

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

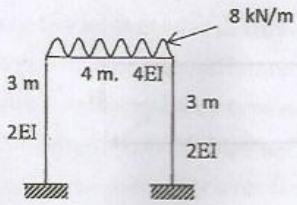

Fig. Q. No.14. b.

15. a) Analyse the frame shown in Fig. 15.a by moment distribution method.

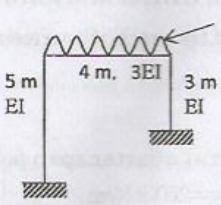

Fig. 15.a.

(OR)

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b) Draw the bending moment diagram for the continuous beam shown in Fig. 15.b. by moment distribution method.

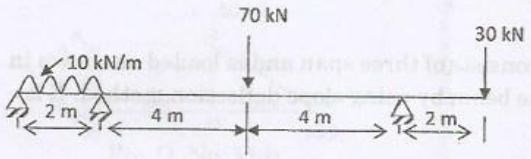

Fig. Q. No.15. b.

PART – C (1×15=15 Marks)

16. a) A train of 5 wheel loads crosses a simply supported beam of span 22.5 m. Using influence lines calculate the maximum positive and negative shear forces at mid span. And absolute maximum bending moment anywhere in the span. 15

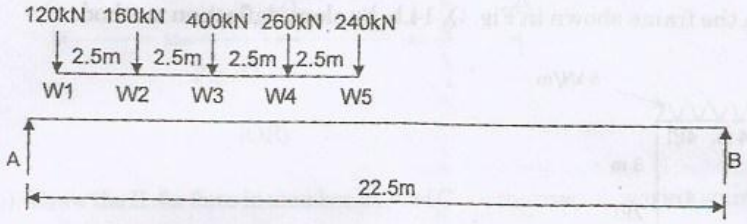

Fig. Q. No.16. a.

(OR)

b) A two hinged parabolic arch of span L and rise R carries a UDL of w/m run over the left hand half of the span. The moment of inertia of the arch rib varies as the secant of the slope of the rib axis.

a) Obtain the expression for the horizontal thrust H. (10)

b) Calculate the horizontal thrust and bending moment at quarter span point on the right half of the span if l = 20 m, r = 4 m and w = 20 kN/m. (5)