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**Question Paper Code : 21259**

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

Sixth Semester

Civil Engineering

CE 2351/CE 61/CE 1352/080100036/10111 CE 602 – STRUCTURAL ANALYSIS – II

(Regulations 2008/2010)

(Common to PTCE 2351/10111 CE 602 – Structural Analysis – II for B.E. (Part-Time) Fourth Semester – Civil Engineering – Regulations 2009/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Differentiate between determinate and indeterminate structures.

2. Find the degree of indeterminacy of a propped cantilever beam.

3. Define static indeterminacy.

4. Define flexibility of a structure.

5. What is meant by discretisation of structures?

6. What are triangular elements?

7. Explain briefly the pure bending.

8. State plastic moment of resistance.

9. Write the applications of space trusses.

10. What are curved beams?

PART B — (5 × 16 = 80 marks)

11. (a) A two span continuous beam ABC is fixed at A and hinged at supports B and C. Span of AB = span of BC = 13 m. Set up flexibility influence co-efficient matrix assuming vertical reaction at B and C as redundant.

Or

(b) A cantilever of length 20 meters is subjected to a single concentrated load of 45 kN at the middle of the span. Find the deflection at the free end using flexibility matrix method. EI is uniform throughout.

12. (a) A two span continuous beam ABC is fixed at A and simply supported over the supports B and C. AB = 10 m and BC = 6 m. Moment of inertia is constant through out. A single concentrated central load of 12 Tons acts on AB and a uniformly distributed load of 11 Ton/m acts over BC. Analyse the beam by stiffness matrix method.

Or

(b) Explain the steps involved in the analysis of pin jointed plane frames using matrix stiffness method.

13. (a) Develop the shape functions for an 8 noded brick element.

Or

(b) Construct the shape functions of a 2D beam element.

14. (a) Find the plastic moment capacity of the beam shown in Fig. Q. 14 (a). EI is constant throughout.

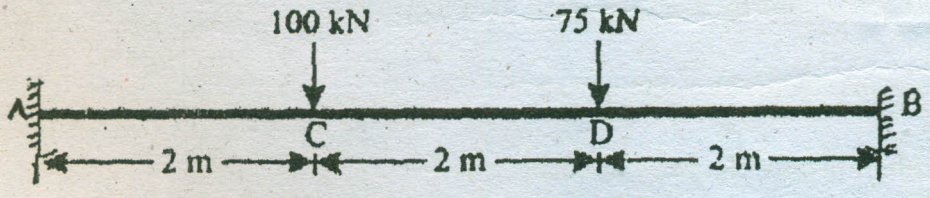


Fig. Q.14(a)

Or

(b) Determine the plastic moment capacity of the frame for the loading given in Fig. Q. 14 (b).

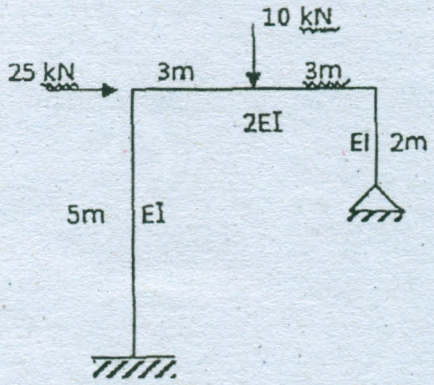


Fig. Q.14(b)

15. (a) Derive the expression for bending moment and torsion for a semi circular beam of radius R. The cross section of the material is circular with radius r. It is loaded with a load at the mid point of the semicircle.

Or

(b) A suspension bridge cable of span 80 m and central dip 8 m is suspended from the same level at two towers. The bridge cable is stiffened by a three hinged stiffening girder which carries a single concentrated load of 20 kN at a point of 30 m from one end. Sketch the SFD for the girder.

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