Question Paper Code : 51244

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2014.

Sixth Semester

Civil Engineering

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

(Regulation 2008/2010)

(Common to PTCE 2351 – Structural Analysis – II for B.E. (Part-Time)
Fourth Semester – Civil Engineering – Regulation 2009)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   What are compatibility conditions?

2.   What are determinate structures?

3.   Write a short note on element stiffness matrix.

4.   Define displacement vector.

5.   What is meant by discretisation of structures?

6.   Define beam element.

7.   List the assumptions made in pure bending.

8.   What is plastic modulus?

9.   Write the applications of space trusses.

10. What are curved beams?

PART B — (5 × 16 = 80 marks)

11. (a)   Find the deflection and slope at quarter span of simply supported beam
           of span L and loaded with uniformly distributed load of intensity w per
           unit length throughout the span.

Or

(b)   A two span continuous beam ABC is fixed at A and hinged at supports
      B & C. Span of AB = span of BC = 6m. Set up flexibility influence
      co-efficient matrix assuming vertical reaction at B & C as redundant.

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

Or

(b) Explain the procedure involved in solving plane stress and plane strain problems in finite element analysis.

14. (a) Explain the following :
(i) Pure bending (8)
(ii) Plastic moment of resistance. (8)

Or

(b) A uniform beam of span 10m and fully plastic moment M_p is simply supported at one end and rigidly clamped at other end. A concentrated load of 40kN may be applied anywhere within the span. Find the smallest value of M_p such that collapse would first occur when the load is in its most unfavourable position.

15. (a) A cable is used to support five equal and equidistant loads over a span of 45 meters. Find the length of the cable required and its sectional area if the safe tensile stress is 140 N/mm² .The central dip of the cable is 3 m and loads are 9 kN each.

Or

(b) Compare the merits and demerits of tension co-efficient method with other methods of analysis.

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