B 213

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2005.

Sixth Semester

Civil Engineering

CE 336 — STRUCTURAL ANALYSIS – II

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Draw the qualitative influence line diagrams for the reactions at a fixed beam.

2. Draw the influence line for shear force and bending moment at a section 2 m from the left end of a simply supported beam of span 6 m.

3. State Muller Breslau's principle.

4. Find the horizontal thrust of a three hinged parabolic arch of span 40 m carrying a point load of 100 KN at point 10 m from the left support.

5. What is indirect model analysis?

6. Write the expressions for change in horizontal thrust and change in rise of a two hinged parabolic arch due to temperature.

7. What is catenary?

8. Why stiffening girders are necessary in the suspension bridges?

9. Give any four examples of beams curved in plan.

10. State upper bound theorem.

PART B — (5 × 16 = 80 marks)

11. (i) Draw the influence line for the reaction R_B of the beam shown in Fig. Q. 11 EI = Constant.

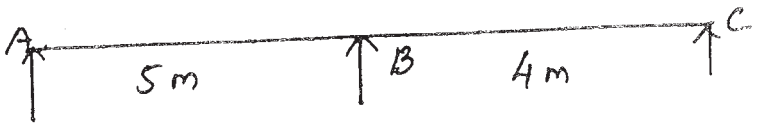

Fig. Q. 11

(ii) Draw the influence line for the reaction at C of the beam described above.

12. (a) The plan and elevation of a space truss is shown in Fig. 12 (a). Determine the forces in the members CF, EF and BF of the truss.

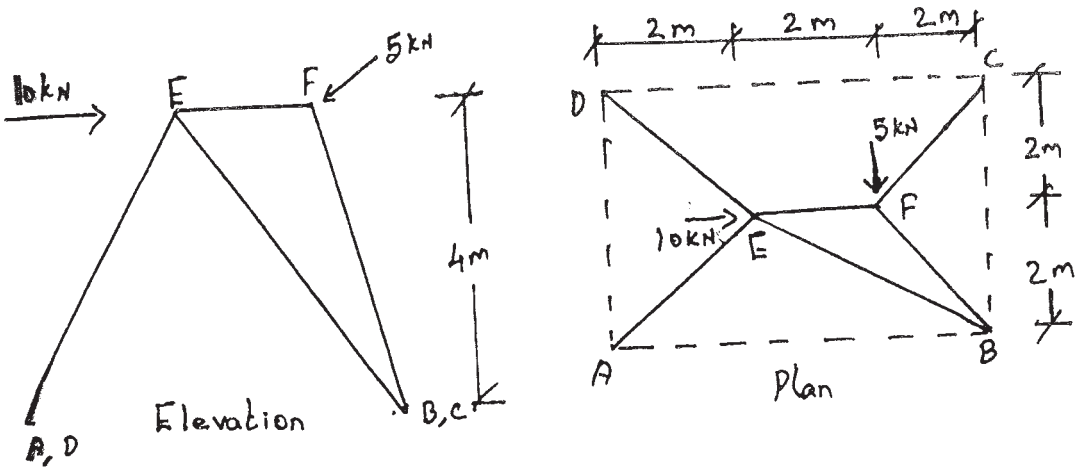

Fig. 12 (a)

Or

(b) Analyse the beam curved in plan shown in Fig. 12 (b) and draw the bending moment and torsional moment diagrams. P = vertical load.

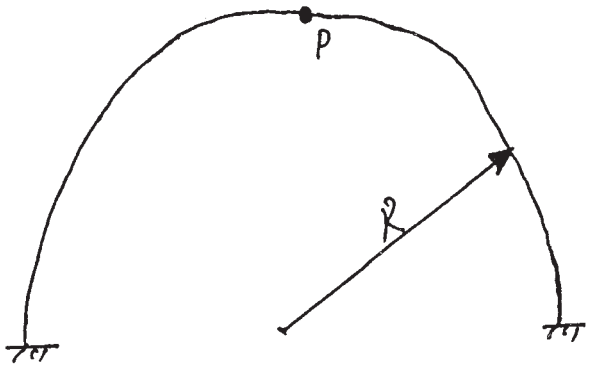

Fig. 12 (b)

13. (a) Derive an expression for horizontal thrust in a two hinged semi circular arch carrying a point load at the crown.

Or

(b) What are the methods of analysing a fixed arch? Explain any one method.

14. (a) A suspension cable with 80 m span and 7 m dip is stiffened by a three hinged girder. The dead load is 16 KN/m. Find the shear force and bending moment in the girder at a section 10 m from the left hinge when a point load of 200 KN is placed at 6 m from the left end.

Or

(b) Determine the forces in the members of the space frame plane view shown in Fig. 14 (b) by tension coefficient method.

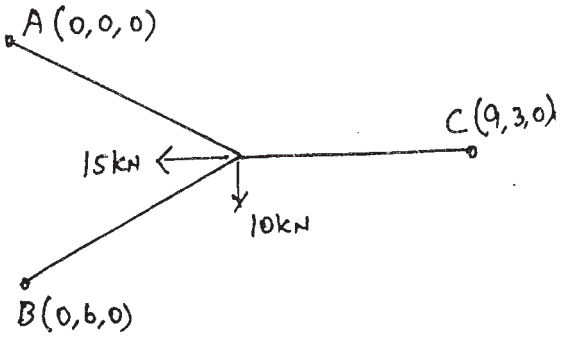

Fig. 14 (b)

15. (a) Derive the shape factor for a triangular cross-section.

Or

(b) Calculate the plastic moment capacity required for the beam shown in Fig. Q. 15 (b). Take load factor = 1.5.

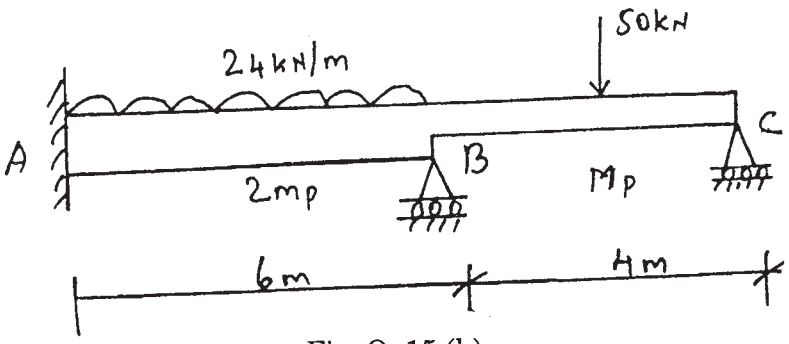

Fig. Q. 15 (b)