R 8145

E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2006.

Sixth Semester

Civil Engineering

CE 336 — STRUCTURAL ANALYSIS — II

: Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

State Muller Breslau's principle.

Draw the qualitative influence line diagrams for reaction and moment at B for the frame shown in Fig. 2.

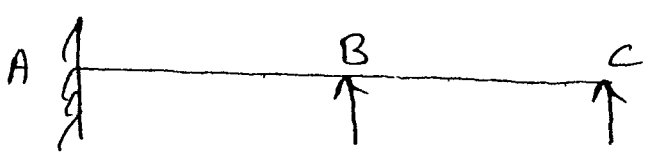

Fig. 2

State the types of arches.

What are the methods of analysis of fixed arches?

What is catenary?

6. In the case of cables supported at different levels, where the maximum tension will occur?

7. What are the forces acting in a cross section of a beam curved in plan?

8. What is the tension coefficient of truss member of length 2 m subjected to a axial compressive load of 10 kN?

9. Derive the shape factor for a rectangular cross section.

10. What is plastic modulus?

PART B — (5 × 16 = 80 marks)

11. (a) Draw the influence line diagram for the support moment B of the beams shown in Fig. 11(a). Take ordinates at 2 m interval EI is constant.

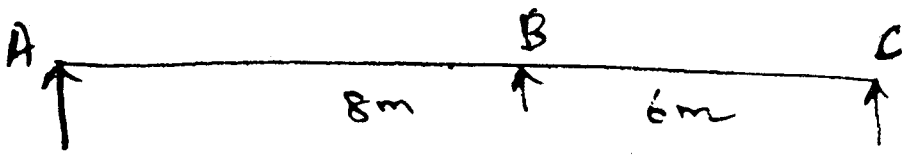

Fig. 11 (a)

Or

(b) Draw the influence line diagram for the propped reaction of a cantilever beam of span 8 m. Take ordinates at 1 m interval.

12. (a) Derive the expression for horizontal thrust of a two hinged semicircular arch of radius R, and carrying UDL of w per unit length over the entire span.

Or

(b) Explain any one method of analysis of a fixed arch.

13. (a) A three hinged stiffening girder of a suspension bridge of span 100 m is subjected to two point loads of 200 kN and 300 kN at the distances of 25 m and 50 m from the left end. Find the shear force and bending moment for the girder at a distance of 30 m from the left end. The central dip is 10 m. Find also maximum tension and its slope in the cable.

Or

(b) A suspension bridge has a cable of span 100 m and a dip of 10 m. The cable is stiffened by a three hinged stiffening girder. Determine the maximum bending moment at a section 25 m from the left end when a uniformly distributed load 10 kN/m longer than span crosses the bridge using influence line diagram.

4. (a) Determine the forces in the members of the space truss shown in the fig. 14(a) by tension coefficient method A, B and C are in the same horizontal plane and D is 5 m above the horizontal plane.

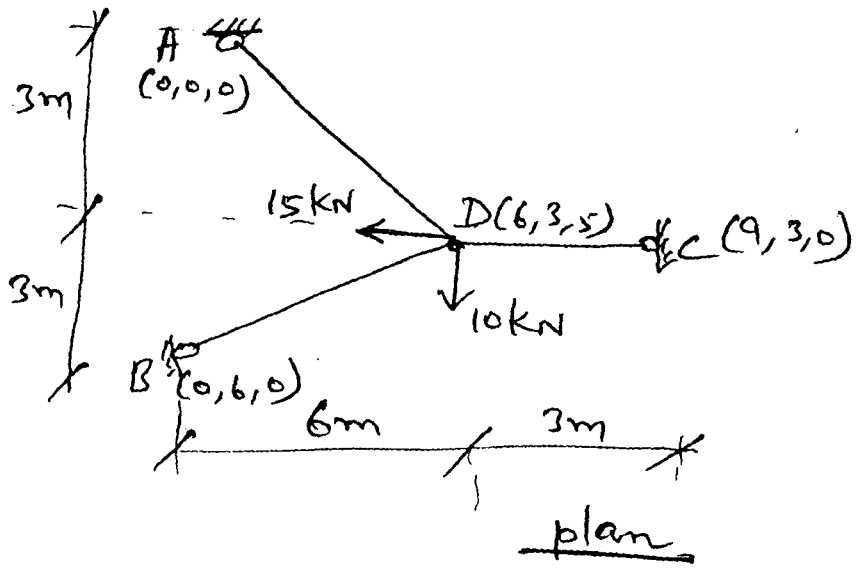

Fig. 14 (a)

Or

(b) A quadrant of a circle of radius R having uniform cross section is horizontal in plan. If is fixed at A and supported on spherical bearing at A as shown in Fig. 14 (b). It carries UDL of w over the entire length. Determine the vertical reaction at A.

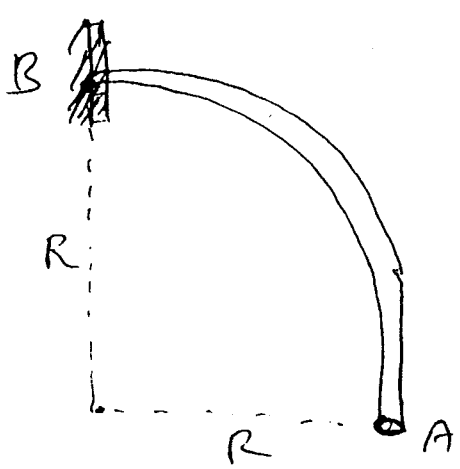

Fig. 14 (b)

15. (a) Determine the shape factor for the T–section in Fig. 15(a).

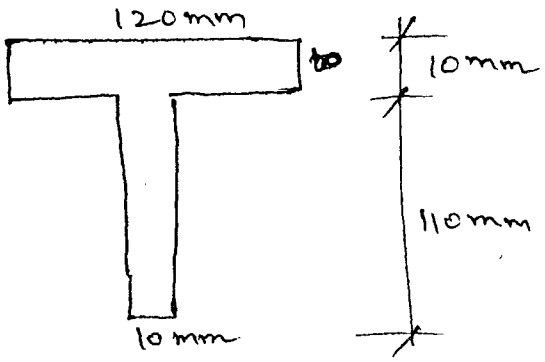

Fig. 15 (a)

Or

(b) Collapse loads acting on the frame ABCD are shown in Fig. 15(b). Determine the plastic moment capacity of the section required. Assume same section throughout.

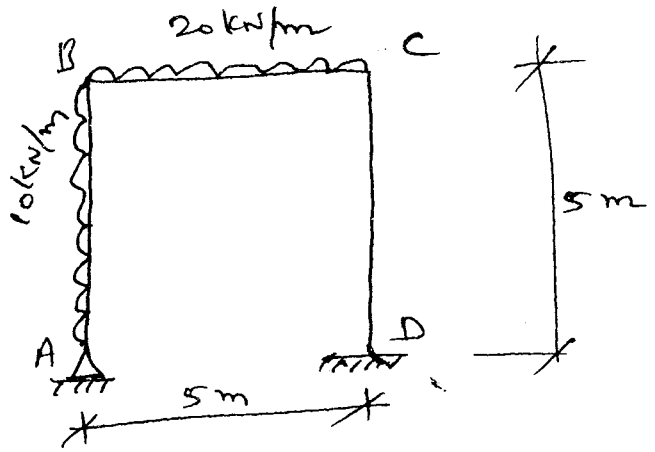

Fig. 15 (b)