SECTION – D

8. Find the forces in the members BC, HG, BG and DG of the truss as shown in Fig. 1.3 . 20

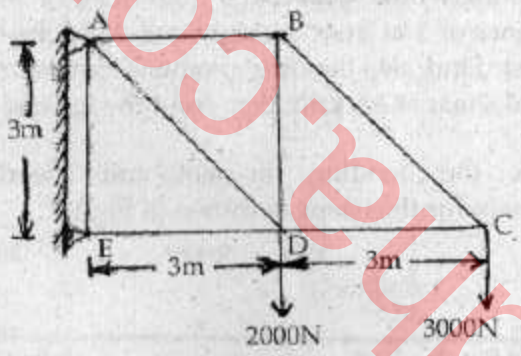

Fig. 1.3

9. Analysis the frame as shown in Fig 1.4 and determine the forces in all members by using tension coefficient method.

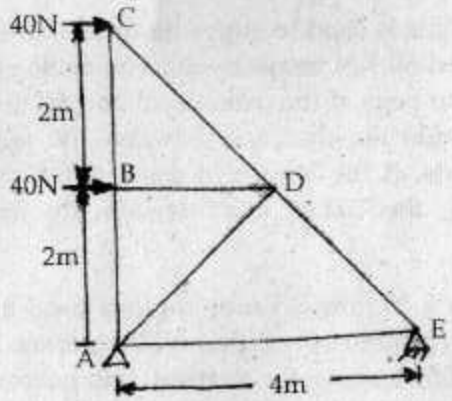

Fig. 1.4

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B. Tech. 4th Semester (Civil) Examination – May, 2017

STRUCTURAL ANALYSIS - II

Paper : CE-202-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Students have to attempt ***five*** questions in total at least ***one*** questions from each Section. Question No. **1** is ***compulsory***. All questions carry equal marks.

1. (a) Explain static indeterminacy. 4

(b) Castigliano's 2nd theorem. 4

(c) Applications of anchor cables. 4

(d) Difference between statically determinate and indeterminate structure. 4

(e) Define tension coefficient. For what type of structures tension coefficient method is employed? 4

SECTION – A

2. (a) Two bars each of length *l* and of the same materials are each subjected to the same axial tensile force P. The first bar has a uniform diameter 2d. The second bar has a diameter d for a length 1/3 and a diameter 2d for the remaining length. Compare the strain energies of the two bars. 10

(b) Four wheel loads 100 KN, 80 KN, 90 KN and 60KN speed at 2 m, 1 m and 1 m respectively roll on
a simply supported girder of span 20 m from left to right with the 90 KN load leading. Find the maximum bending moment that can occur under the 80 KN load. 10

3. Analyse the frame shown in Fig 1.1 by moment distribution method. Draw bending moment diagram. 20

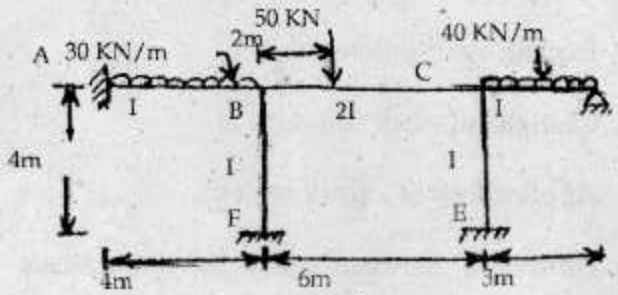

Fig. 1.1

SECTION – B

4. A three-hinged parabolic arch of span 30 m and rise 5 m carried a uniformly distributed load of 40 KN per m on the whole span and a point load of 200 KN at a distance of 5 m from the right end. Find the horizontal thrust. Find also bending moment, normal thrust and radial shear at a section 5 m from the left end. 20

5. Draw the bending moment and shearing force diagram for the beam as shown in Fig 1.2 20

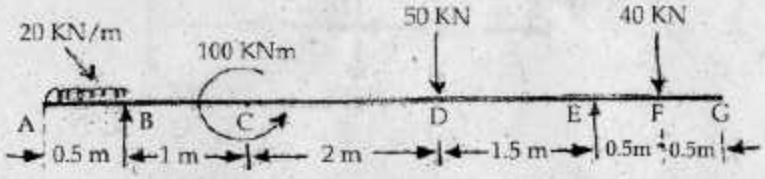

Fig. 1.2

SECTION – C

6. A light cable is used to supports three loads of 35 KN, 40 KN and 50 KN respectively. The cable is tied at its end to two pegs at the same level and 60 m apart. The loads divide the distance between the pegs in four equal parts. If the length of cable is 8.5 m. Find the shape of the cable and tension in its different segment. 20

7. A 40 mm x 40 mm x 5 mm angle is used as a simply supported beam over a span of 2.4 metres. It carries a load of 200 N along the vertical axis passing through the centroid of the section. Determine the resulting bending stress on the outer corner of the section, along the middle section of the beam. 20