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Section-D

8. Analysis the truss by using method of joints as shown in Fig. 1.5 20

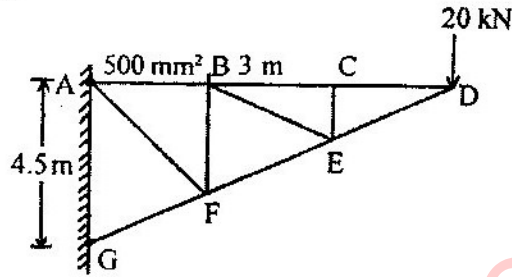


Fig. 1.5

9. Analysis the space frame as shown in Fig. 1.4 by the method of tension coefficient. 20

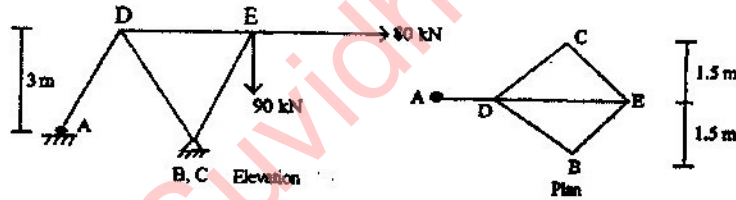


Fig. 1.4

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B. Tech. 4th Semester (Civil) Examination,

May-2016

STRUCTURAL ANALYSIS-II

Paper-CE-202-F

Time allowed : 3 hours]

[Maximum marks : 100

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

1. (a) Find the deflection at the free end of the cantilever beam with varying load as shown in fig. 1.1 by Strain Energy method.

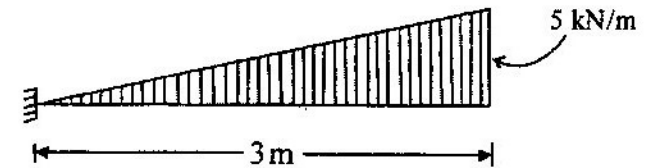


Fig. 1.1

- (b) Derive an expression for the change in a suspension cable due to temperature stress.
- (c) Define Castigliano's 2<sup>nd</sup> theorem.
- (d) Shear centre for channel
- (e) Statically determinate and indeterminate structures.

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## Section-A

2. Analysis the frame as shown in Fig. 1.2 by slope deflection methods and draw bending moment diagram and deflected shape of the fram. 20

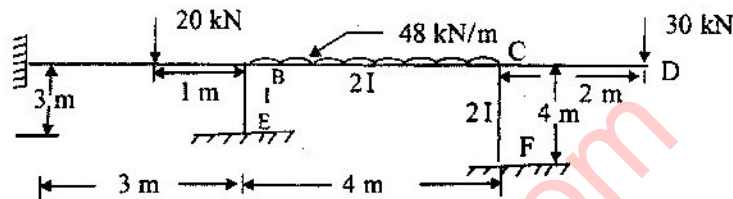


Fig. 1.2

3. Four wheel loads 10 KN, 30 KN, 15 KN, 25 KN spaced at 2M, 1.5 M, 1 M respectively roll on a girder of span 25 m moves from the left to right. Find the maximum shear force and bending moment at 9.5 m from the left end. 20

## Section-B

4. A three hinged parabolic arch has a span of 40 m and rise of 7 m. It is subjected to a uniformly distributed load of 80 KN acting at 10 m from the right supports. Find the
- (1) Horizontal thrust and vertical reaction of supports
  - (2) Normal thrust and radial shear
  - (3) bending moment at 10 m from the left support. 20

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5. Draw the shear force and bending moment diagram for the beam loaded as shown in Fig. 1.3 20

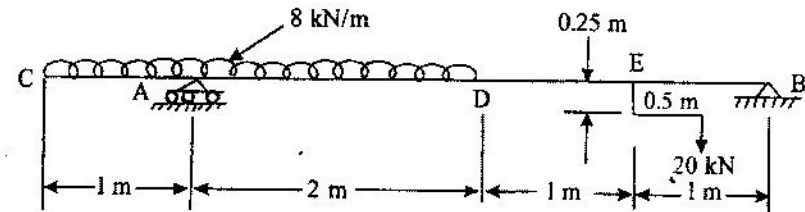


Fig. 1.3

## Section-C

6. A 50 mm × 50 mm × 10 mm angle is used as a simply supported beam over a span of 3.4 m. It carries a load of 250 N along the vertical axis passing through the centroid of the section. Determine the resulting bending stresses on the outer corner of the section, along the middle section of beam. 20
7. The span of three-hinged stiffening girder bridge is 350 m and its central dip is 40 m. A single load of 70 KN rolls along the bridge. Determine the horizontal thrust H at a section 60 m from the left support as well as when the load is at 40 m from the left support. Also find the maximum value of H. Find the maximum load W and the maximum positive moment under the load when it is 50 m from left supports as well as the maximum shear force at the same section. 20

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