Total No. of printed pages = 4

CT-401/SA/4th Sem/2015/M

STRUCTURAL ANALYSIS

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *five* questions.

1. Determine the vertical and the horizontal deflection at the free end of the bent shown in figure 01. Assume constant EI throughout. 14

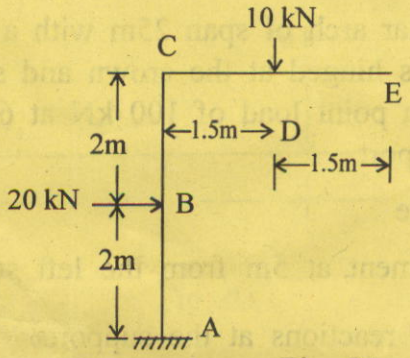

Fig.-01

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2. (a) Discuss influence line diagram. 3

(b) Using influence line diagram concept, determine the shear force and bending moment at section C in the simply supported beam shown in figure 02. 11

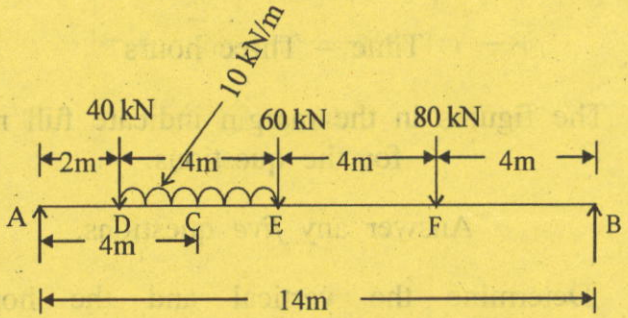

Fig.-02

3. A circular arch of span 25m with a central rise of 5m is hinged at the crown and springing. It carries a point load of 100 kN at 6m from the left support.

Calculate

(i) Moment at 5m from the left support

(ii) The reactions at the supports

(iii) The reactions at the crown. 14

4. Define and or explain : 14

(a) Degree of indeterminacy

(b) Unit load method

(c) Strain energy and virtual work

(d) Relation between original beam and its corresponding conjugate beam.

5. (a) Define and explain moment area theorems. 4

(b) Determine the slope and deflection at the free end of a cantilever beam as shown in figure 03 by moment area method. 10

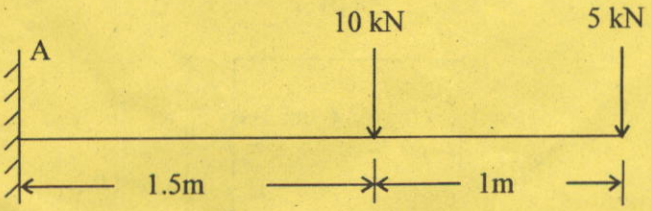

Fig.-03

6. Determine the slope and deflection at B and C in the cantilever beam as shown in figure 04. Assume constant E for throughout. 14

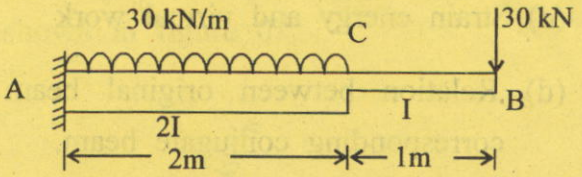

Fig.-04