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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Fourth Semester, B.E. - Civil Engineering

Semester End Examination; June - 2017

Analysis of Structures - I

Time: 3 hrs *Max. Marks: 100*

***Note**: i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.*
ii) Missing data, if any, may be suitably assume.

UNIT - I

1 a. Determine Static and Kinematic indeterminacy of the structures shown in Fig. 1(a). 8

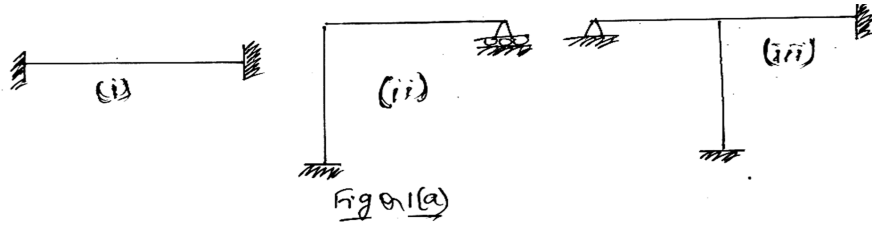

Fig Q1(a)

b. Determine the forces in the members BC, CF and EF of the truss shown in Fig. 1(b) by method of sections. 12

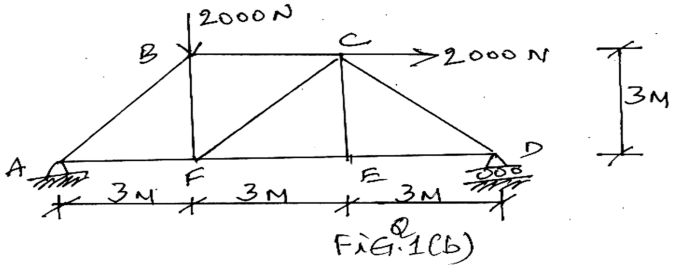

Fig. Q 1(b)

2 a. State and explain moment area theorems. 6

b. Determine slope and deflection at free end of the cantilever shown in Fig. Q (2b) by moment area method. 14

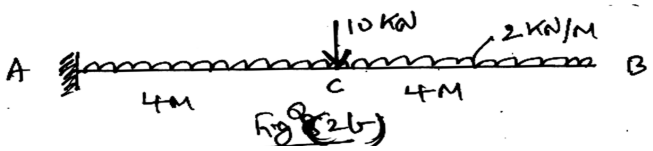

Fig Q (2b)

UNIT - II

3 a. State and explain Castiglione's 1st theorem. 4

b. Obtain the actual beam of the conjugate beam shown in Fig. Q (3b). 4

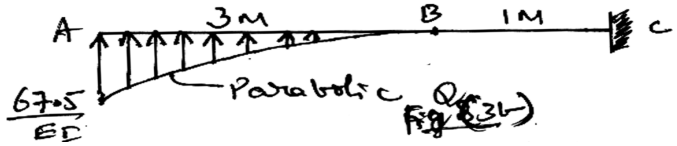

Fig Q (3b)

c. Determine the deflection under the load for the beam shown in Fig. Q (3c) by conjugate beam method. 12

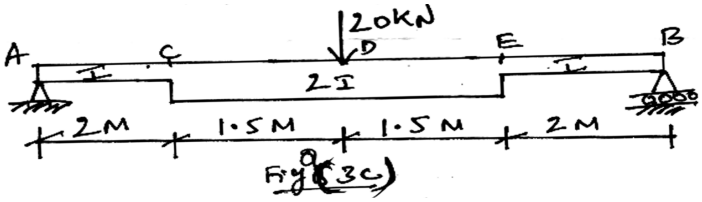

Fig Q (3c)

Contd….2

4 a. Derive an expression for strain in energy due to axial force. 5

b. Determine the deflection at 'C' for the beam shown in Fig. Q (4b) by strain energy method. 15

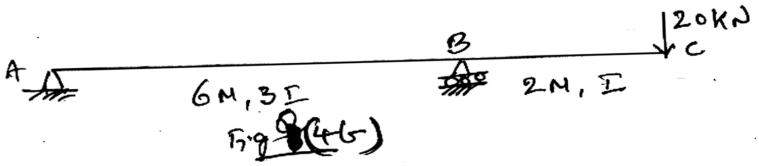

Fig Q(4b)

UNIT - III

5 a. Show that the profile of the cable is parabolic, when it is subjected to udl throughout the span. 5

b. A three hinged parabolic arcs has a span of 24 m and central rise of 4 m. It carries a point load of 50 kN at 18 m from left support and an udl of 30 kN/m over the left half portion. Determine bending moment, normal thrust and radial shear @ 6 m from left. 15

6 a. Determine the support reactions for the beam shown in Fig Q (6a) by using influence line diagram. 8

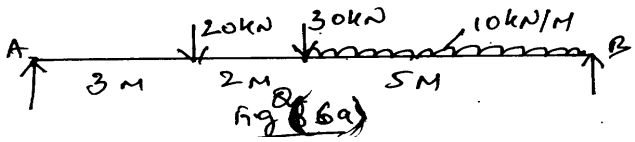

Fig Q(6a)

b. An udl of 20 kN/m of length 4 m crosses the simply supported beam of span 12 m. Determine maximum shear force and bending moment @ a section 5 m from left using influence using diagrams. 12

UNIT - IV

7. Draw BMD, SFD and elastic curve for the beam shown in Fig. Q.(7) by consistent displacement method. EI is constant. 20

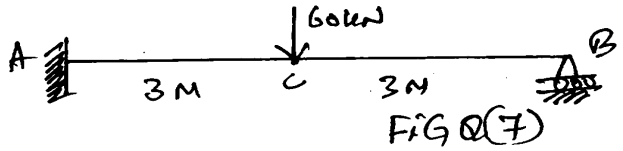

FiG Q(7)

8. Draw BMD and elastic curve for a fixed beam ABCD fixed @ A and D. Lengths AB = BC = 2 m and CD = 4 m. The portion CD supports an udl of 16 kN/M. The consistent displacement method. EI is constant 20

UNIT - V

9. Determine the propped end reaction for the beam shown is Fig. Q. (9) by strain energy method. EI constant. 20

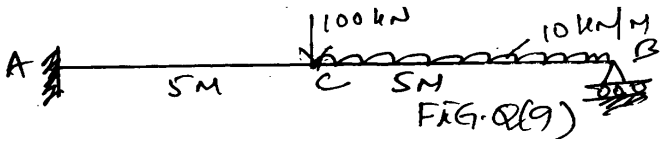

FiG. Q(9)

10. Draw BMD and elastic curve for the beam shown in Fig. Q.(10) by using three moment equations. 20

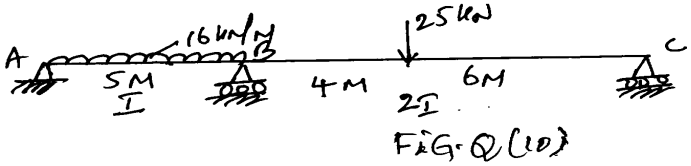

FiG. Q(10)

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