CBCS SCHEME

USN | | | | | | | | | |

17CT42

Fourth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Structural Analysis

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Differentiate between statically determine and statically indeterminate structure, with example. **(06 Marks)**

b. Find the force in the members of the truss of the Fig Q1(b) by method of joints. Tabulate the results.

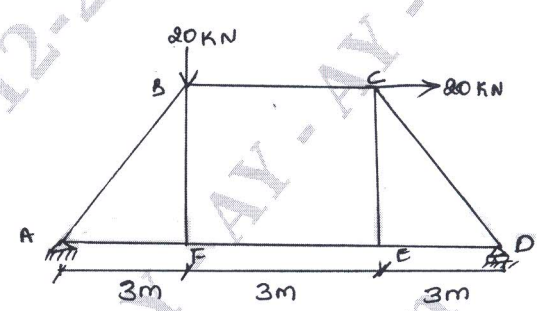

Fig Q1(b) **(14 Marks)**

OR

2 a. Determine the slope and deflection at the free and of the beam shown in Fig Q2(a) by moment area method. Take EI = 4000 kN/m^2.

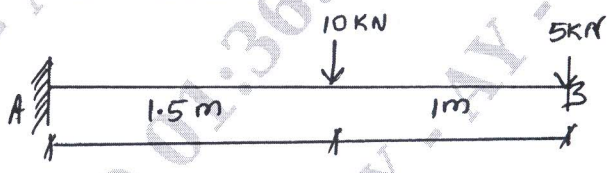

Fig Q2(a) **(10 Marks)**

b. Determine the deflection under point load and slope at A using conjugate beam method shown in Fig Q2(b).

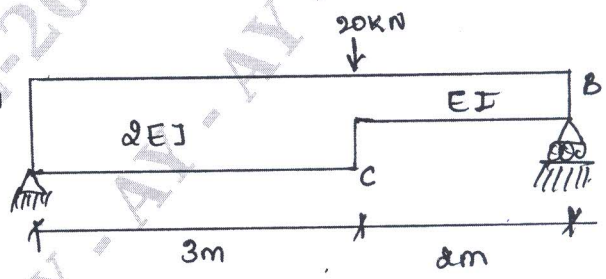

Fig Q2(b) **(10 Marks)**

Module-2

3 a. State and explain Castigliano's first theorem and give the procedure for finding deflection using Castingliano's theorem. **(10 Marks)**

b. Determine the vertical deflection at 'C' for the beam shown in Fig Q3(b) by Castigliano's method.

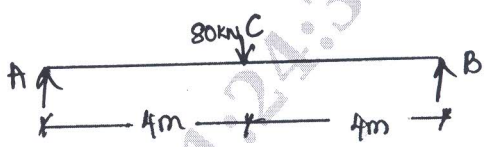

Fig Q3(b) **(10 Marks)**

OR

4 a. Find the vertical deflection at C for the heat shown in Fig Q4(a) using strain energy method. Take EI constant

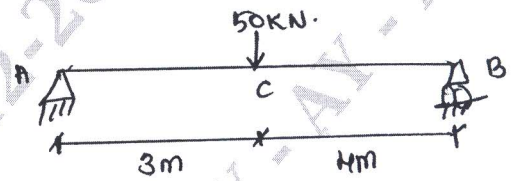

Fig Q4(a) **(10 Marks)**

b. Derive the equation strain energy due to bending. **(10 Marks)**

Module-3

5 A three hinged symmetrical parabolic arch of span 30m and central rise 5m subjected to a point load 80kN at 10m from left hinge. Draw BMD. Determine :
i) Reactions ii) Normal thrust and radial shear at 12m from left hinge. **(20 Marks)**

OR

6 A cable is supported on piers 80m apart at the same level, has a central dip of 8m. Calculate the maximum tension in the cable, when it is subjected to udl of 30kN/m throughout the length. Also determine the vertical forces on the piers, if the backstay (anchor cable) is inclined to 60° to the vertical and the cable passes over pulley. **(20 Marks)**

Module-4

7 a. Determine the reaction components for the propped cantilever subject to uniformly distributed load as shown in Fig Q7(a) by using consistent deformation method.

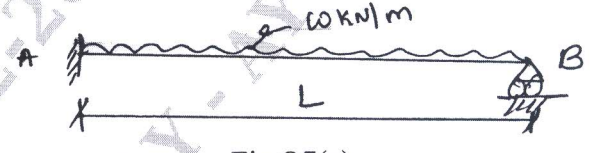

Fig Q7(a) **(10 Marks)**

b. Determine the reaction component in the propped cantilever shown in Fig Q7(b). EI is constant throughout.

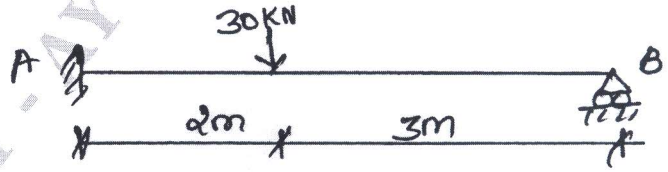

Fig Q7(b) **(10 Marks)**

OR

8 Analyse the continuous beam shown in Fig Q8 by Clayperon's three moment theorem. Draw BMD, SFD and elastic curve.

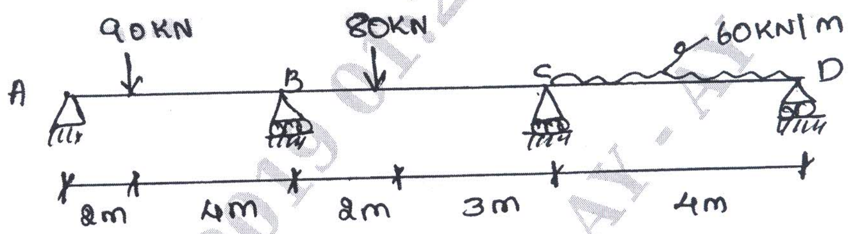

Fig Q8

(20 Marks)

Module-5

9 Analyse the frame loaded as shown in Fig Q9. Draw BMD for the frame.

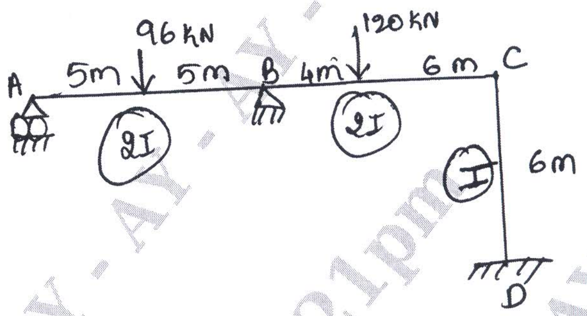

Fig Q9

(20 Marks)

OR

10 Determine the support moments and draw the bending moment diagram for a loaded beam shown is Fig Q10, use moment distribution method. Ends 'A' and 'D' are fixed.

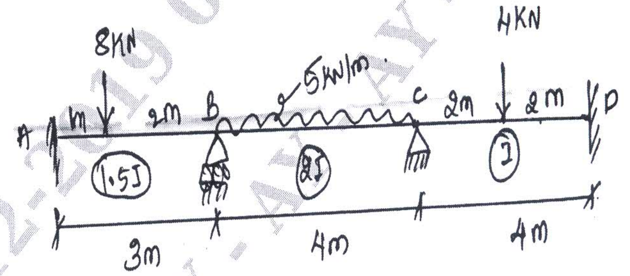

Fig Q10

(20 Marks)

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