R13

Code No: 114DQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, May - 2015
STRUCTURAL ANALYSIS-I
(Common to CE, CEE)

Time: 3 Hours Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

1.a) Write the differences between rigid jointed and pin jointed structures? [2M]
b) Explain the procedure in analyzing a truss by using method of sections? [3M]
c) Write the equations for calculating normal thrust and radial shear in any arch? [2M]
d) Calculate the deflection at free end of a cantilever beam of length 'L' subjected to a UDL of w/m acting over the whole span? [3M]
e) What is the resisting moment developed at fixed support when a propped cantilever beam (length L) is subjected to a point load W at centre? [2M]
f) What is the fixed end moment generated at one end of a fixed beam of length 'L' due to sinking of other support in a fixed beam by 'δ'? Flexural rigidity is EI. [3M]
g) What is carryover moment? [2M]
h) Explain how the applied moment is distributed among the members meeting at a joint. [3M]
i) What is Equal Uniformly Distributed Load? [2M]
j) Draw ILDs for reaction at support and bending moment at centre in a simply supported beam of length 'L' with overhang length 'a' on both the sides? [3M]

Part-B (50 Marks)

2. Calculate the member forces for the truss shown in figure 1 by using method of joints. [10]

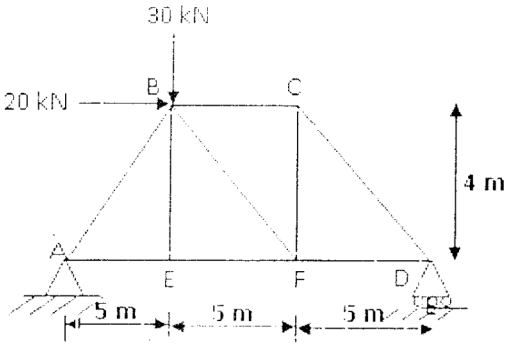


Figure:1

OR

3. Determine the member forces for the truss shown in figure 2 by using the method of tension co-efficient? [10]

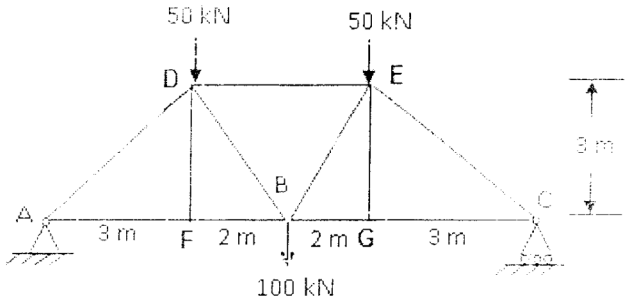


Figure: 2

4. A beam of length 4.5 m simply supported at the ends carries a point load 30 kN at a distance of 3m from the left end. $I_{xx}=55x10^{-6}$ m^4 and E = 200 GN/m^2, Find a) The deflection under the load. b) The position and amount of maximum deflection by using the strain energy theorem? [5+5]

OR

5. A three hinged circular arch hinged at the springing and crown points has a span of 40 m and a central raise of 80m. It carries a uniformly distributed load of 20 kN/m over the left half of the span together with a concentrated load of 100 kN at the right quarter span point. Find the reactions at the supports, normal thrust and shear at a section 10 m from the left support? [10]

6. Draw Bending moment diagram for the propped cantilever beam shown in figure 3. [10]

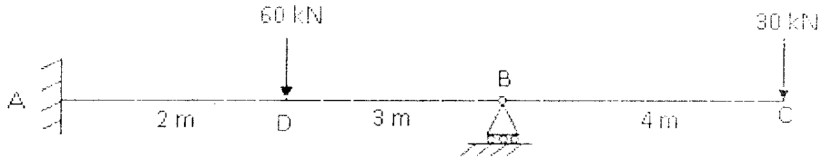


Figure: 3

OR

7. Draw Shear force diagram for the fixed beam shown in figure 4. [10]

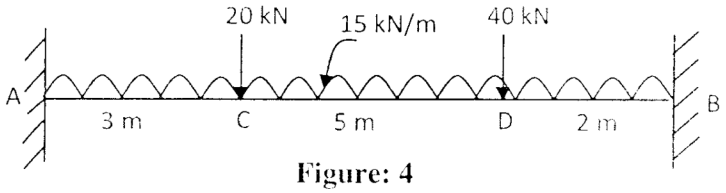


Figure: 4

8. A continuous beam is as shown in figure 5. The support B sinks by an amount of 15/EI. Analyse the beam by using Slope deflection method? [10]

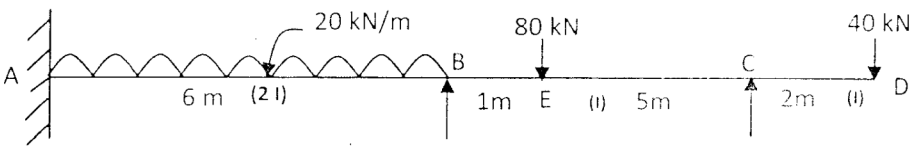
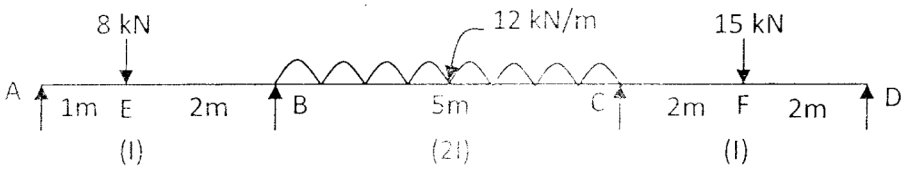


Figure: 5

OR

9. Draw BMD for the continuous beam shown in figure 6 by using Moment distribution method? [10]



(6)

Figure: 6

10. A Uniformly distributed load of 15 kN/m and 6 m long crosses a girder of span 20 m. Calculate the Absolute maximum Shear force and Absolute maximum bending moment? [10]

OR

11. A system of Four loads 20kN, 40kN, 50 kN and 30 kN crosses a beam of 30 m span with 30 kN leading the distance between the loads are 2m, 3m and 4m respectively. Find the maximum bending moment and shear force at a section 12m from left support? [10]

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