

MANIPAL INSTITUTE OF TECHNOLOGY MANIPAL

IV SEMESTER B.TECH. (CIVIL ENGINEERING) END SEMESTER EXAMINATIONS, APRIL/MAY 2017 SUBJECT: ANALYSIS OF INDETERMINATE STRUCTURES [CIE 2202] REVISED CREDIT SYSTEM (21/04/2017)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

✤ Answer ALL the questions.

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✤ Missing data may be suitable assumed.

Q.No	Question	Marks	CO
1A.	A two hinged parabolic arch of span '1' and rise 'h' carries a uniformly distributed load of w/unit length over the entire span. (i) Obtain the expression for the horizontal thrust 'H' (ii) Calculate the horizontal thrust, Normal thrust and Radial shear at distance of 10m from right support if 1=30 m, h = 6 m and w = 10 kN/m.	6	1
1B.	For the beam shown in Figure 1B , determine the fixing moment at the ends 'and draw the bending moment diagram at salient values. Take EI constant	4	1
2A.	Analyze the continuous beam shown in figure 2A using CTMT method. The values of E and I are 200 GPa and $0.2 \times 10^9 \text{ mm}^4$ respectively and uniform throughout. Support B sinks by 30mm. Draw BMD.	6	1
2B.	Analyse the beam shown in Figure Q2B , by Slope deflection method if B sinks by 7mm. take $EI=14000$ kN-m ² throughout.	4	1
3A.	Using Moment distribution method, obtain the end moments for the beam shown in Figure Q3A. Take EI constant.	6	1
3B.	Obtain the end moments for the frame shown in Figure Q3B, by Kani's method.	4	1
4A.	Analyze the propped cantilever shown in Figure Q4A using Castigliano's theorem. Draw FBD. Take EI constant	4	1
4B.	Determine the plastic section modulus required for the frame shown in Figure Q4B . Take yield stress of material as 250 MPa.	6	3
5A.	Determine collapse load for simply supported beam of uniform cross section and length 6m, loaded with UDL of intensity w kN/m throughout its length. Also, determine the plastic section modulus required to sustain a UDL of 10 kN/m if yield stress is 250 MPa. Use static method of plastic analysis.	5	3
5B.	In the truss shown in Figure Q5B, draw Influence Line Diagram for the members U2L3, U4L4, U2L2, L3L4 and U5U6	5	2





