ET-502(B)

B.Tech. Civil (Construction Management) / B.Tech. Civil (Water Resources Engineering)

Term-End Examination

☐ 1. ◄ ◄ ☐   **December, 2014**

ET-502(B) : STRUCTURAL ANALYSIS

Time : 3 hours   *Maximum Marks : 70*

Note : *Attempt any **five** questions. All questions carry equal marks. Use of scientific calculator is permitted.*

1. Write some characteristics of influence lines. With the help of neat sketches, briefly discuss how influence lines are used to calculate the maximum shear force at a section of a simply supported beam subjected to moving loads.   *14*

2. A three-hinged symmetrical circular arch has a span of 20 m with a central rise of 5 m. The hinges are located at abutments and highest point of the arch. Find the maximum horizontal thrust due to an 8 m long udl of 20 kN/m intensity.   *14*

3. A beam AB is rigidly fixed at both the ends. Determine the end reactions if the end B sinks by a distance Δ. *14*

4. Analyse the continuous beam shown in Figure 1 by the slope deflection method. Draw shear force and bending moment diagrams. *14*
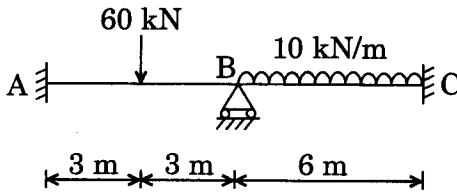

Figure 1

5. Analyse the rigid joint frame shown in Figure 2 by the moment distribution method. Draw the deflected shape and bending moment diagram for the frame. *14*
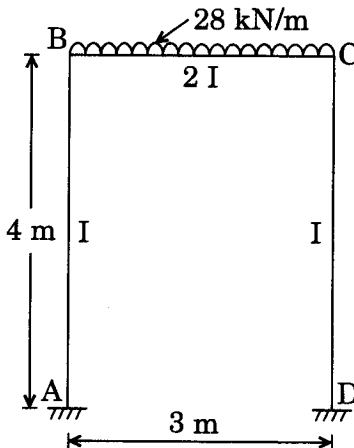

Figure 2

6. Find the fixed end moments of a beam AB of span L and loaded with uniformly distributed load of w per unit length over the whole span. *14*

7. A fixed beam of span L carries a uniformly distributed load w (total) on the left half portion. Using plastic theory, determine the value of w at collapse. The plastic moment of resistance of the beam is M_P. *14*

8. Calculate the deflection and slope at the free end of a cantilever beam carrying uniformly distributed load w per unit length over the entire span. *14*

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