School of Engineering
B.TECH Civil Engineering
Mid Term Examination - May 2024

Duration : 90 Minutes
Max Marks : 50

### Sem IV - G1UA403B - Structural Analysis

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1) Explain the concept of moving load influence lines. K2 (2)

2) Find the reaction at the prop of a propped cantilever beam loaded with a uniformly distributed load of w/l over the whole span (L). Use strain energy method. K1 (3)

3) Describe the assumptions made in the strain energy method and their implications on analysis accuracy. K2 (4)

4) Briefly explain how an Influence Line Diagram is different from a Shear Force Diagram. K2 (6)

5) A simply supported beam has a span of 15 m and subjected to an UDL of 30 kN/m, 5 m long travelling from left to right. Draw the ILD for shear force and bending moment at a section 6 m from the left end. Use these diagrams for calculating the maximum BM and SF at this section. K3 (6)

6) A live load of 15 kN/m, 5 m long moves on a girder simply supported on a span of 13 m. Find the maximum bending moment that can occur at a section 6 m from the left end. K3 (9)

7) Analyze the propped cantilever shown by using slope defection method. K4 (8)
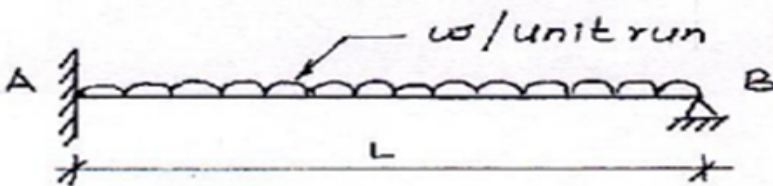
8) Describe the procedure to draw an Influence Line Diagram for a specific point on a beam subjected to a uniformly distributed load. K4 (12)

OR

A circular three hinged arch of span 25m with a central rise of 5m is hinged at the crown and the end supports. It carries a point load of 100kN at 6m from the left support. Examine and Calculate i. The reaction at the supports,ii. Moment at 5m from the left support K4 (12)