

**GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2020**

**Subject Code:3154010**

**Date:01/02/2021**

**Subject Name:Advanced Structural Analysis**

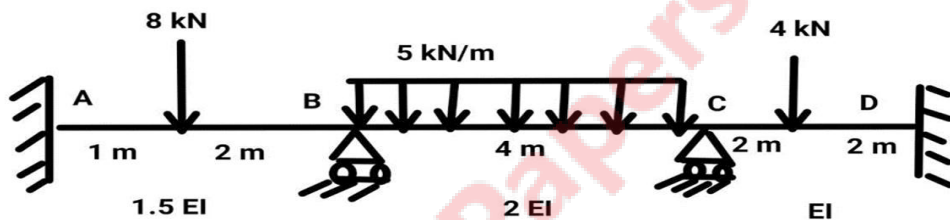
**Time:10:30 AM TO 12:30 PM**

**Total Marks: 56**

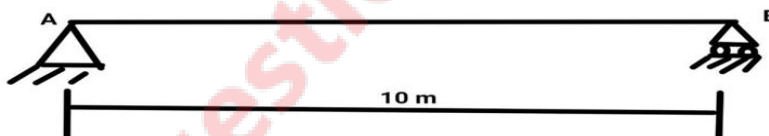
**Instructions:**

1. Attempt any **FOUR** questions out of **EIGHT** questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

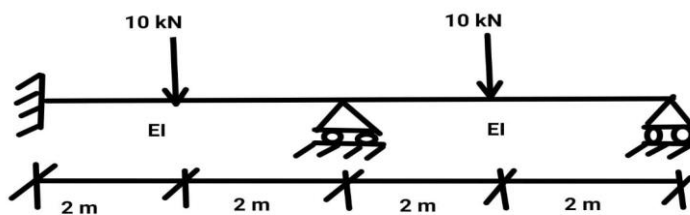
- |            |  | Marks |
|------------|--|-------|
| <b>Q.1</b> | (a) Explain Theorem of Least Work with one example                             | 03    |
|            | (b) Write the steps of Flexibility Method of Analysis                          | 04    |
|            | (c) Differentiate between Stiffness Method and Flexibility Method.             | 07    |
| <b>Q.2</b> | (a) Write down the importance of Influence Line Diagram in Structural Analysis | 03    |
|            | (b) Explain Principle of Virtual Work with one example                         | 04    |
|            | (c) Solve the following beam with Moment Distribution Method                   | 07    |



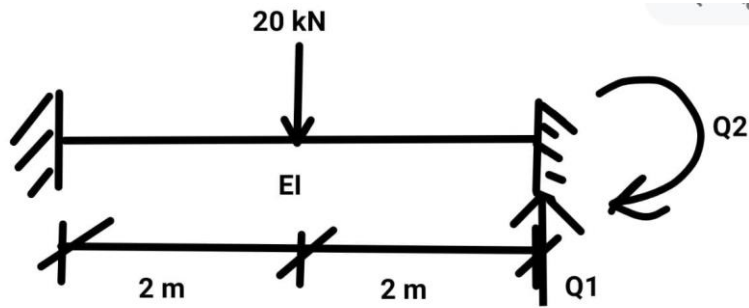
- |            |  |    |
|------------|--|----|
| <b>Q.3</b> | (a) Explain Muller-Breslau Principle with example.   | 03 |
|            | (b) Write the steps of Stiffness Method of Analysis  | 04 |
|            | (c) Construct Influence line diagram for support reaction at B for the beam shown in figure. | 07 |



- |            |   |    |
|------------|---|----|
| <b>Q.4</b> | (a) Differentiate between Slope deflection Method & Moment Distribution Method  | 03 |
|            | (b) Explain The Factors which causes the Sway in Portal Frame   | 04 |
|            | (c) Construct Influence Line diagram for Simply Supported Beam having span length "L" meter and having uniformly distributed load over the whole span of intensity "w" kN per meter | 07 |
| <b>Q.5</b> | (a) Find stiffness Matrix for the following Beam shown in figure.   | 03 |

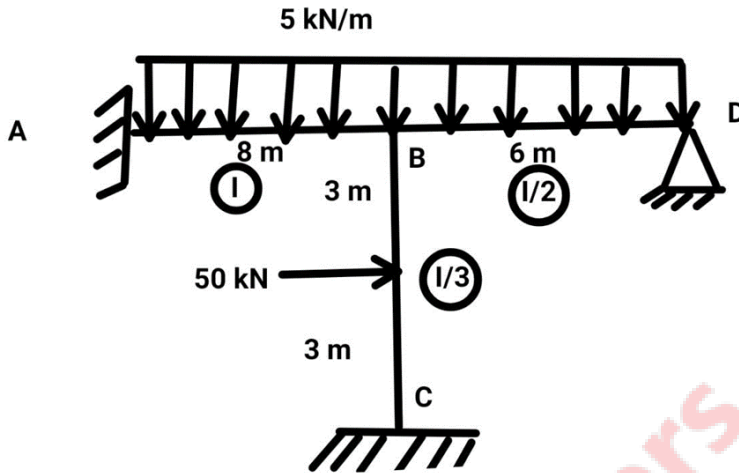


- |     |  |    |
|-----|--|----|
| (b) | Determine Flexibility Matrix for beam shown in figure. Take Q1&Q2 as redundant | 04 |
|-----|--|----|



(c) Solve The Following frame with Moment Distribution Method

07



Q.6 (a) Explain Method of Consistent Deformations.

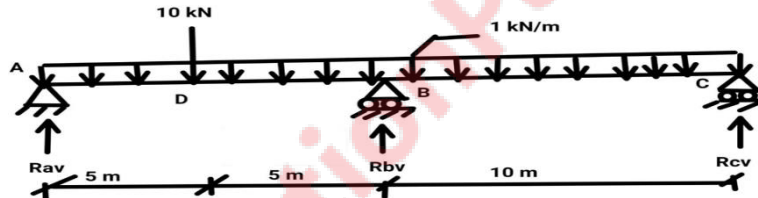
03

(b) Explain Kinematic and Static Indeterminacy with example

04

(c) Solve the following beam with Flexibility Method. EI is constant for all span.

07



Q.7 (a) List The Essential Features of Stiffness Method

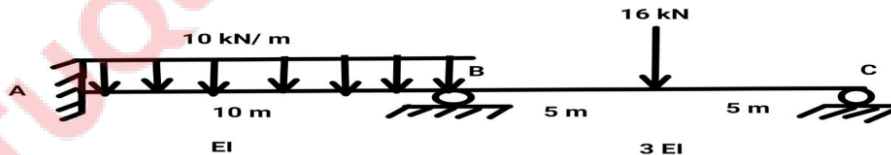
03

(b) Write difference between Force and Displacement Method of Structural Analysis.

04

(c) Solve the Following beam by Stiffness Method.

07



Q.8 (a) List The Essential Features of Flexibility Method

03

(b) Explain Axial Stiffness and Axial Flexibility

04

(c) Solve the following beam by Flexibility method.

07

