Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2020

Subject Code:2174007 **Date:30/01/2021**

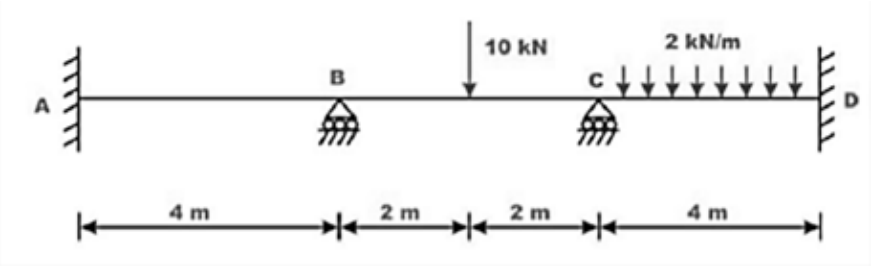
Subject Name: Computer Aided Structural Ananysis and Design

Time:10:30 AM TO 12:30 PM **Total Marks: 56**

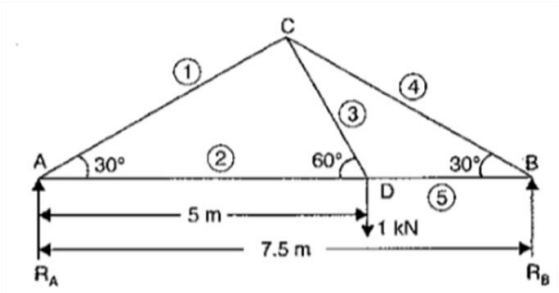
Instructions:

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

			MARKS
Q.1	**(a)**	Explain any two of the following: (i) Static and kinematic indeterminacy (ii) Member flexibility matrix (iii) Principle of superposition	**03**
	(b)	Explain role of transformation matrix in structural analysis	**04**
	(c)	Write a note on "Importance of Matrix Algebra in Matrix Methods of Structural Analysis".	**07**
Q.2	**(a)**	Discuss on "Contra gradient Principle".	**03**
	(b)	Briefly explain flexibility method of analysis.	**04**
	(c)	Explain properties & special characteristics of stiffness matrix of a structure.	**07**
Q.3		Analyze the continuous beam shown Figure. Assume that the supports are unyielding. Assume that EI is constant for all members, using Stiffness Method.	**14**



Q.4	**(a)**	Derive load vector and displacement matrix for simply supported beam subjected to w kN/m uniformly distributed load long entire span of L.	**07**
	(b)	Explain local and global stiffness matrix for a simple truss member with example.	**07**
Q.5		A truss of span 7.5 m carries a point load of 1 kN at joint D as shown in figure. Find the reactions and forces in the members of the truss, using Stiffness Method.	**14**



Q.6	**(a)**	Write short note on "Static condensation of stiffness matrix".	**07**
	(b)	Write short note on "Sub Structuring of stiffness matrix".	**07**
Q.7		Enumerate generalized steps involved for analysis and design of building in commercial software packages and explain them in brief.	**14**
Q.8		Consider a two bay two storey frame is to be analyzed by computer programme of stiffness matrix method	
	(a)	Prepare flow chart for the programme & state input required.	**07**
	(b)	How will you input support conditions of the structure?	**07**

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