Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V(NEW) EXAMINATION – SUMMER 2022

Subject Code:3150614 Date:13/06/2022

Subject Name:Structural analysis-II

Time:02:30 PM TO 05:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define thinfluence line diagram and give statement of Muller Breslau principle.	**03**
	(b)	Derive slope and deflection method equations from first fundamentals.	**04**
	(c)	Determine reactions at the support and draw S.F. and B.M. diagram for a beam shown in Fig.1. Use Castigliano's theorem.	**07**
Q.2	**(a)**	Write assumptions made in slope deflection method.	**03**
	(b)	Define: Carry over moment, Distribution factor, Carryover factor,	**04**
	(c)	Draw B.M. and S.F. diagram for a beam shown in Fig.2 using Slope and deflection method.	**07**
		OR	
	(c)	Draw B.M. and S.F. diagram for a beam shown in Fig.2 using the Moment distribution method.	**07**
Q.3	**(a)**	Define: Sway. What are the causes for Sway in portal frames?	**03**
	(b)	Enlist steps of unit load method to analyse indeterminate structures.	**04**
	(c)	Analyse the frame shown in Fig.3 using the moment distribution method.	**07**
		OR	
Q.3	**(a)**	Explain Castigliano's both theorems.	**03**
	(b)	Draw qualitative shapes of influence lines for reactions in two bay- two storeyed fixed based portal frame.	**04**
	(c)	Determine the horizontal deflection at A of truss as shown in Fig.4. Use unit load method.	**07**
Q.4	**(a)**	Draw "Restrained Structure" and "Released structure" for a propped cantilever beam.	**03**
	(b)	Explain characteristics of influence line diagram for statically indeterminate structures.	**04**
	(c)	Draw the influence line for reactions Va, Vb, and Vc for the two span continuous beam having span AB = 8m and BC = 4m.Compute ordinates at 2 m interval.	**07**
		OR	
Q.4	**(a)**	Explain various types of skeletal Structures.	**03**
	(b)	Explain essential features of stiffness method.	**04**
	(c)	Analyse L-bent shown in Fig.5 using flexibility method.	**07**
Q.5	**(a)**	Define Stiffness. Derive relation between stiffness and flexibility.	**03**
	(b)	A simply supported beam AB has span 8 m. Draw influence line for Ra, Rb, Vx and Mx for a section at 3m from left hand support.	**04**
	(c)	Analyse the beam shown in Fig.6 by flexibility method.	**07**

OR

Q.5	**(a)**	Differentiate: Stiffness method and Flexibility method. Which method is suitable for general computer programming? Why?	**03**
	(b)	What is Qualitative influence line and Quantitative influence line?	**04**
	(c)	Analyse the beam shown in Fig.6 by stiffness method.	**07**

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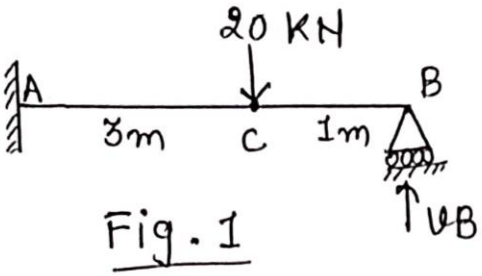

Fig. 1

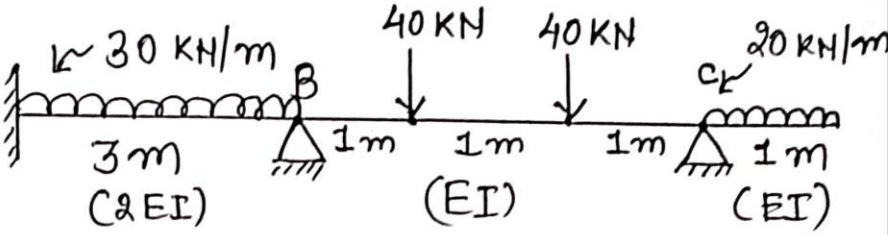

Fig. 2.

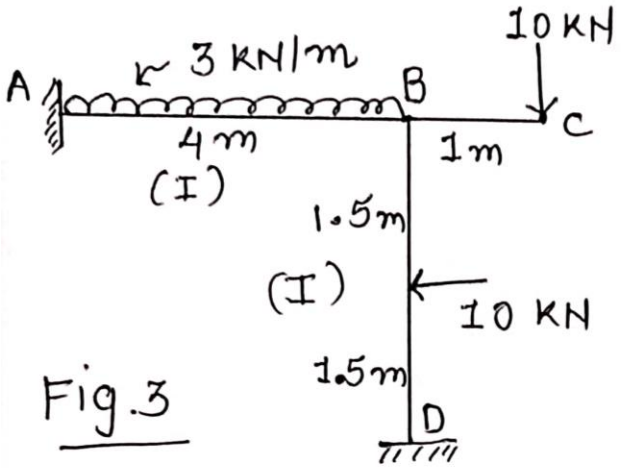

Fig. 3

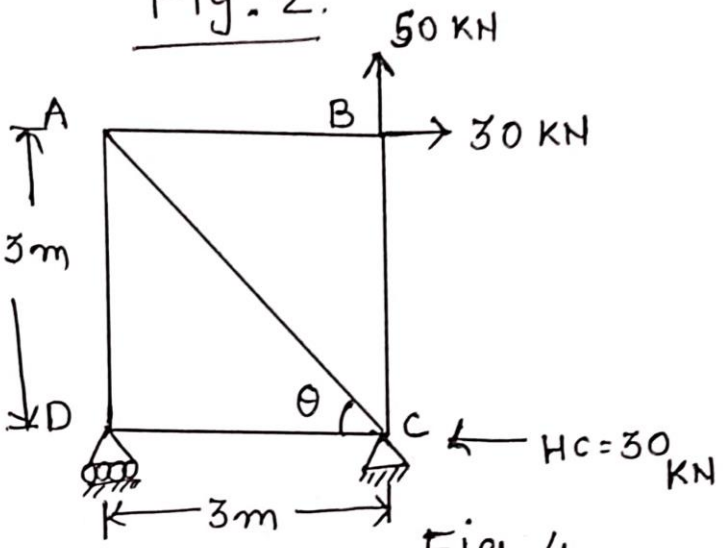

Fig. 4

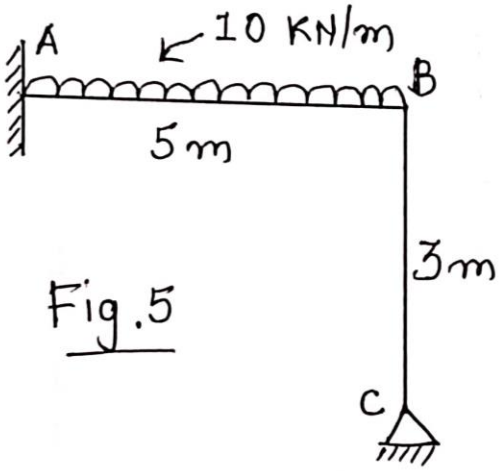

Fig. 5

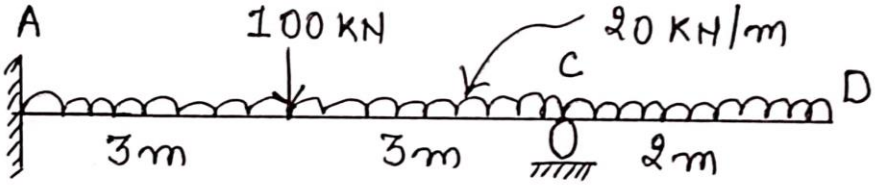

Fig. 6