Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – WINTER 2013

Subject Code: 140603 **Date: 26-12-2013**

Subject Name: Structural Analysis - II

Time: 10.30 am - 01.00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Draw neat and clean figures wherever required.**

Q.1	**(a)**	Analyze the portal frame shown in Fig. 1by moment distribution method and find only final moments.	**10**
	(b)	Explain the terms "Rotational Contribution" and "Distribution Factor".	**04**
Q.2	**(a)**	Analyze the beam shown in Fig. 2 by slope deflection method and find unknown slopes at Joint B and C. Joint B sinks by 10 mm. $E = 2 \times 10^5$ MPa and $I = 16 \times 10^7$ mm^4.	**07**
	(b)	Find the final moments at supports for the beam shown in Fig.2 and plot SF and BM diagram both.	**07**
		OR	
	(b)	Find the unknown slope at B for the frame shown in Fig. 3 by slope deflection method.	**07**
Q.3	**(a)**	Determine the final rotational contribution for each support of the beam shown in Fig. 4 by Kani's method.	**07**
	(b)	Find the support moments and plot BM diagram for the beam shown in Fig. 4 by the Kani's Method.	**07**
		OR	
Q.3	**(a)**	Determine the final rotational contribution for each support of the beam shown in Fig. 5 by Kani's method.	**07**
	(b)	Find the support moments and plot BM diagram for the beam shown in Fig. 5 by the Kani's Method.	**07**
Q.4	**(a)**	Find the support moments for the fixed beam shown in Fig. 6 by using the basic concepts of moment area theorem.	**07**
	(b)	Determine the deflection under the point load for the beam shown in Fig. 7 by unit load method. $E = 2 \times 10^5$ MPa and $I = 3 \times 10^9$ mm^4.	**07**
		OR	
Q.4	**(a)**	Derive the expression for the fixed end moment for a fixed beam of which one of the supports is sinking by amount "δ".	**07**
	(b)	Determine the rotation at the free end of the beam shown in Fig. 8 by Castiglione's theorem. $EI = 2 \times 10^{13}$ N.mm^2.	**07**
Q.5	**(a)**	What are the losses in the prestressed Concrete? Explain any one of them which will occur in both post tensioned and pre tensioned concrete.	**06**
	(b)	Determine the influence line ordinates for the reaction at C for the beam shown in Fig. 9 at 2 m interval and plot it. EI is constant.	**08**
		OR	
Q.5	**(a)**	Determine the influence line ordinates for the shear force at mid span BC for the Fig. 10 at 1 m interval and plot it. EI is constant.	**08**
	(b)	Find the support reactions for the propped cantilever beam shown in Fig. 11.	**06**

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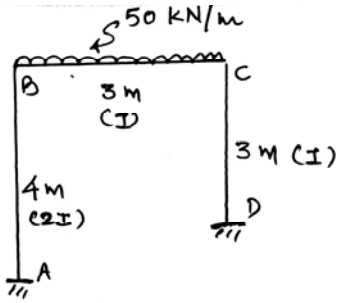

Fig. 1

(Q.1 (a))

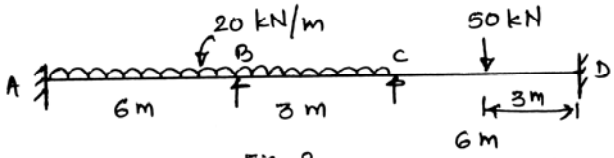

Fig. 2

(Q. 2 (a) and (b))

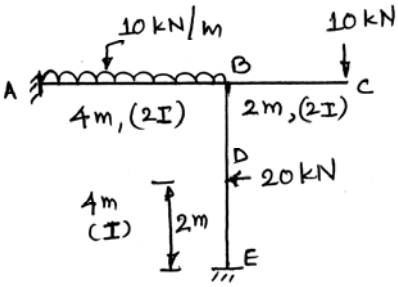

Fig. 3

(OR (Q. 2 (b)))

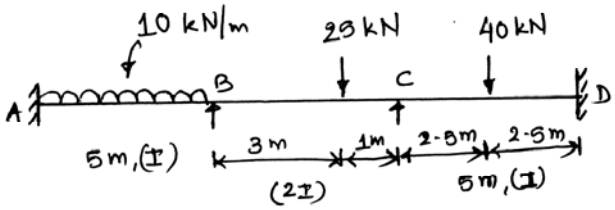

Fig. 4

(Q. 3 (a) and (b))

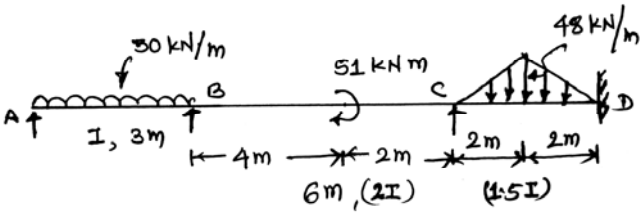

Fig. 5

(OR Q. 3 (a) and (b))

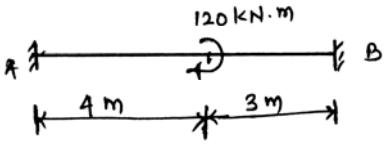

Fig 6

(Q. 4 (a))

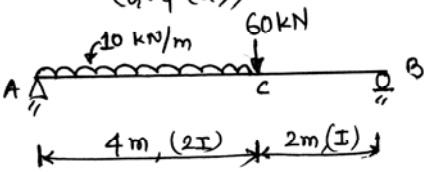

Fig. 7

(Q. 4 (b))

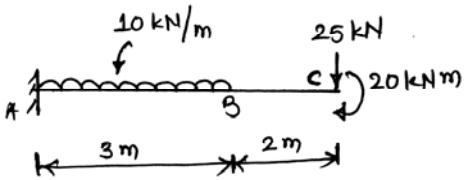

Fig. 8

(OR Q. 4 (b))

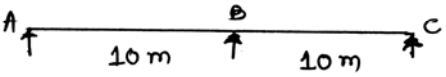

Fig. 9

(Q. 5 (b))

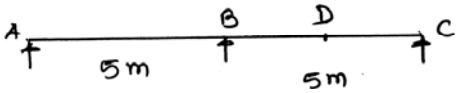

Fig. 10

(OR (Q. 5 (a))

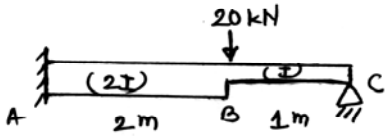

Fig. 11

(OR. Q. 5 (b))