Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. - SEMESTER – IV • EXAMINATION – WINTER 2012

Subject code: 140603 **Date: 29/12/2012**

Subject Name: Structural Analysis - II

Time: 02.30 pm - 05.00 pm **Total Marks: 70**

Instructions:

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

Q.1	**(a)**	Analyze the frame as shown in fig. 1, by using moment distribution method and draw bending moment diagram.	**10**
	(b)	Briefly explain various losses in prestress.	**04**
Q.2	**(a)**	Using slope deflaction method analyzes the beam as shown in fig. 2. Draw SFD and BMD both.	**07**
	(b)	Define the following terms. Carry over factor, stiffness and distribution factor	**07**
		OR	
	(b)	A pre-tensioned beam of size 100 mm x 300 mm is prestressed by a straight cables having an initial force of 200 kN, at an eccentricity of 60 mm. Es = 210 kN/mm^2 and Ec = 35 kN/mm^2. Calculate the percentage of prestress in steel due to elastic shortening of concrete if area of steel wires is 188 mm^2.	**07**
Q.3	**(a)**	Analyze the fixed beam shown in fig. 3 and draw bending moment diagram only.	**07**
	(b)	Using consistent deformation method determines all reaction components of beam as shown in fig. 4 and plot SFD and BMD.	**07**
		OR	
Q.3	**(a)**	Analyze the fixed beam shown in fig. 5 and draw bending moment diagram only.	**07**
	(b)	Using consistent deformation method determines all reaction components of beam as shown in fig. 6 and plot SFD and BMD.	**07**
Q.4	**(a)**	Analyze the continuous beam as shown in fig. 7 by Kani's Method and draw bending moment diagram only.	**07**
	(b)	Draw the ILD for moment at B in the continuous beam as shown in fig. 8. Calculate the ordinates at 2 m intervals, assuming EI is constant throughout.	**07**
		OR	
Q.4	**(a)**	Analyze the continuous beam as shown in fig. 9 by Kani's Method and draw bending moment diagram only.	**07**
Q.4	**(b)**	Draw the ILD for shear force at D in the continuous beam as shown in fig. 10. Calculate the ordinates at 1 m intervals, assuming EI is constant throughout.	**07**
Q.5	**(a)**	Determine horizontal deflaction at point D for the frame as shown in fig. 11. Adopt I = 2 x 10^8 mm^4 and E = 2 x 10^5 MPa.	**07**
	(b)	Analyze the frame by using slope deflaction method for fig. 12. Draw bending moment diagram also.	**07**
		OR	
Q.5	**(a)**	Determine the deflaction at point C of an overhanging beam as shown in fig. 13. Adopt E = 2 x 10^5 N/mm^2 and I = 2 x 10^8 mm^4.	**07**
	(b)	The bent ABC is shown in fig. 14. Analyze using slope deflaction method and plot bending moment diagram only.	**07**

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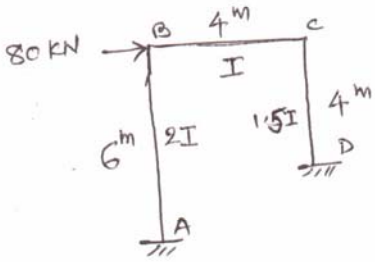

Fig. 1 (Q-1 (a))

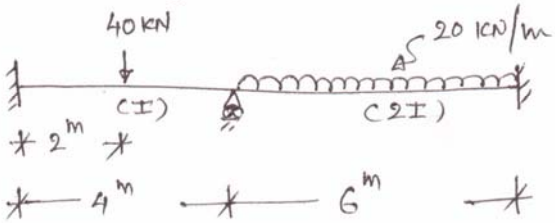

Fig. 2 (Q-2 (a))

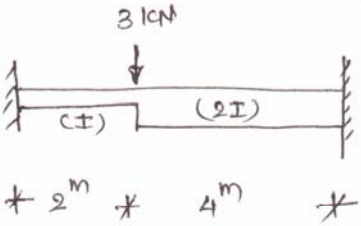

Fig. 3 (Q-3 (a))

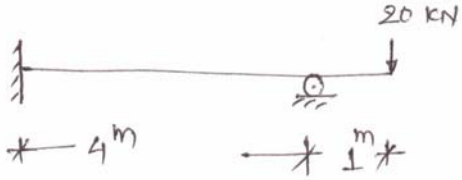

Fig. 4 (Q-3(b))

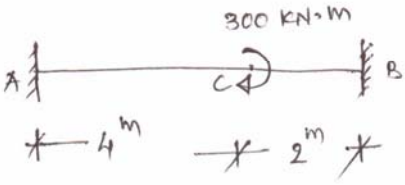

Fig. 5 (OR Q-3 (a))

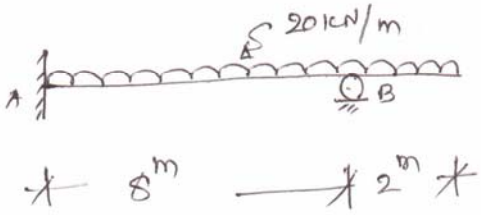

Fig. 6 (OR Q-3(b))

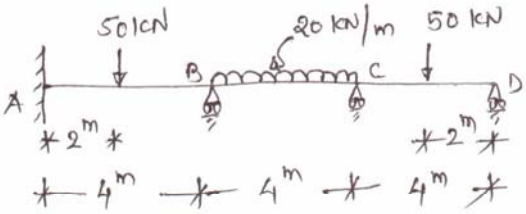

Fig. 7 (Q-4 (a))

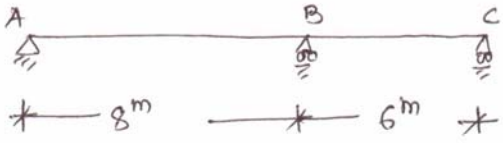

Fig. 8 (Q-4 (b))

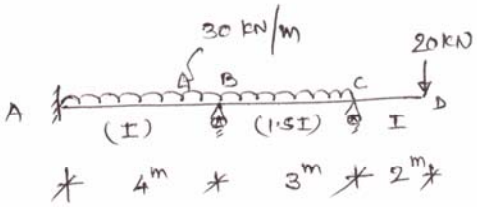

Fig. 9 (OR Q-4 (a))

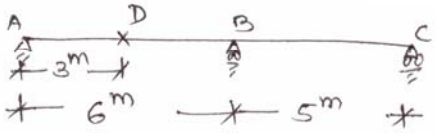

Fig. 10 (OR Q.4 (b))

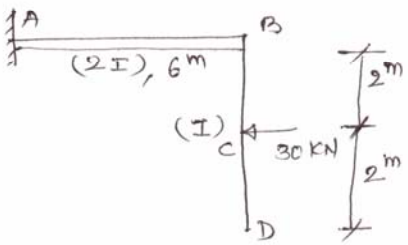

Fig. 11 (Q.5 (a))

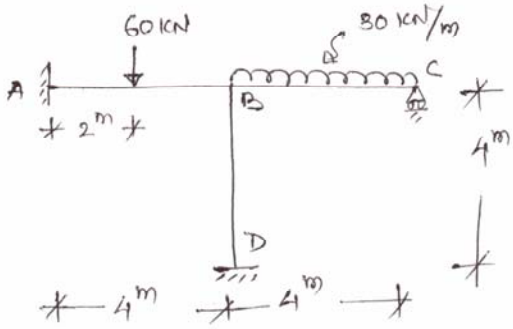

Fig. 12 (Q.5 (b))

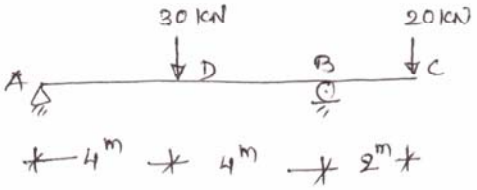

Fig. 13 (OR Q.5 (a))

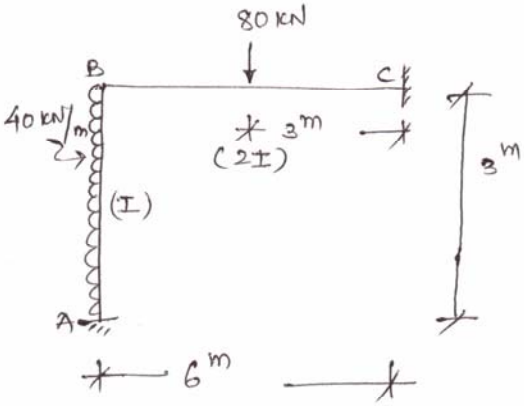

Fig. 14 (OR Q.5 (b))