Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV EXAMINATION – WINTER 2015

Subject Code: 140603 Date:01/01/2016

Subject Name: Structural Analysis II

Time: 02:30pm to 05:00pm Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Assume E = $2x10^5$ N/mm^2 and I = $2x10^8$ mm^4 where required.**

Q.1	**(a)**	Analyze the beam as shown in the figure.1 by consistent deformation method and draw the bending moment and shear force diagrams.	**07**
	(b)	Analyze the fixed beam as shown in the figure.2 and draw the bending moment and shear force diagrams.	**07**
Q.2	**(a)**	Analyze the beam as shown in the figure.1 by minimum strain energy method and draw the bending moment and shear force diagrams.	**07**
	(b)	Calculate the vertical displacement at the tip of cantilever beam as shown in the figure. 3 by unit load method.	**07**
		OR	
	(b)	Calculate the vertical displacement at the tip of the cantilever bent as shown in the figure.4 by unit load method.	**07**
Q.3		Analyze the beam shown in the figure.5 by slope deflection equations method and draw the bending moment diagram.	**14**
		OR	
Q.3		Analyze the beam shown in the figure.5 by Kani's method and draw the bending moment diagram.	**14**
Q.4		Analyze the portal frame shown in the figure.6 by Moment distribution method and draw the bending moment diagram.	**14**
		OR	
Q.4		Analyze the portal frame shown in the figure.6 by slope deflection equations method and draw the bending moment diagram.	**14**
Q.5	**(a)**	For a continuous beam ABC having span AB = 8m and span BC = 10m, calculate and sketch the ordinates for reaction at support B at every 2m interval.	**07**
	(b)	Write short notes on different types of prestressing used in prestressed concrete giving merits and demerits of each. Also name the various losses occur in the prestressed concrete.	**07**
		OR	
Q.5	**(a)**	For a propped cantilever beam of span 10m, calculate and sketch the ordinates of influence line for reaction at propped end at every 2m interval. Hence or otherwise calculate ordinates of influence line for moment at support at every 2m interval.	**07**
	(b)	A prestressed concrete beam of span of 8m has width 300mm and depth of 700mm. it is prestressed by a cable force of 1500kN at the position of 200mm from bottom. It is loaded by super imposed load of 20kN/m. Calculate the stresses at the top and bottom fibers. Assume that total prestress losses are 15%	**07**

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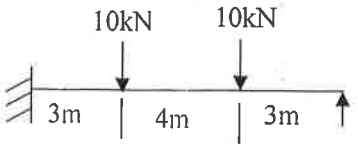

Figure.1

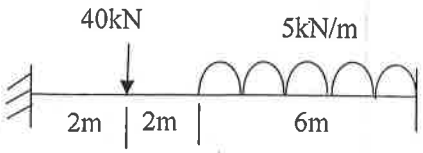

Figure.2

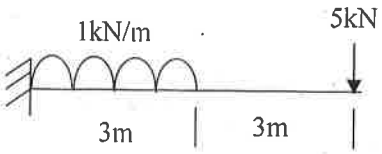

Figure.3

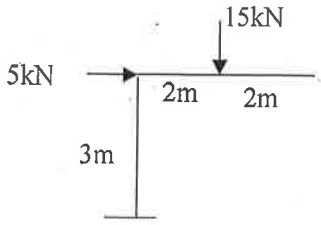

Figure.4

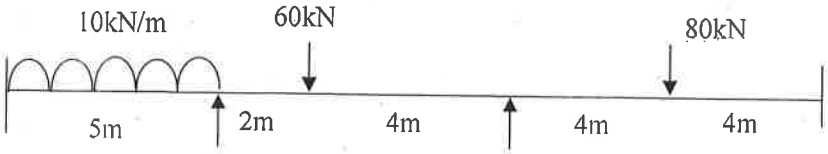

Figure.5

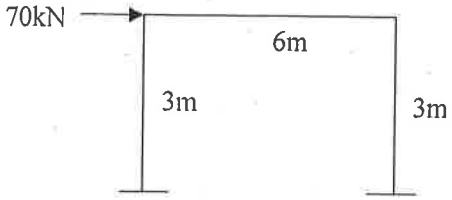

Figure.6