Enrolment No._____

Seat No.: ______ GUJARAT TECHNOLOGICAL UNIVERSITY **BE - SEMESTER-IV • EXAMINATION - SUMMER 2015**

Subject Code: 140603 Date: 03/		Code: 140603 Date: 03/06/2015	06/2015	
		Vame: Structural Analysis - II		
Time: 10.30am-01.00pmTotal Marks: 70Instructions:				
		bt all questions.		
	_	suitable assumptions wherever necessary.		
3. F	igure	s to the right indicate full marks.		
Q-1	(a) (b)	Differentiate between pre-tensioning and post-tensioning in detail. What is an influence line diagram? Explain its importance in structural	4 3	
	(~)	analysis.	•	
	(c) (d)	Explain: Distribution factor and Rotation contribution factor Write advantages of fixed beam over simply supported beam.	4 3	
Q-2	(a)	Analyze the beam shown in Figure-1 by using Kani's method and draw bending moment diagram.	7	
	(b)	Analyze the fixed beam shown in Figure-2 and draw bending moment diagram only.	7	
	(b)	OR Analyze the Continuous beam shown in Figure - 3 and draw bending moment	7	
	(b)	diagram only.	7	
Q-3	(a)	State Castigliano's theorem I and II.	4	
	(b)	Analyze the beam shown in Figure - 4 by using Moment Distribution method and draw Shear Force and Bending Moment Diagrams. OR	10	
Q-3	(a)	Define the term 'sway'. Enlist the situation wherein say occur in portal frames.	4	
	(b)	Analyze the beam shown in Figure - 4 by using Slope Deflection method and draw Shear Force and Bending Moment Diagrams.	10	
Q-4	(a)	Using consistent deformation method determine all reaction components of beam as shown in Figure – 5 and plot SFD and BMD.	7	
	(b)	Using Castigliano's 1 st theorem, find the slope and the deflection at the free end of a cantilever beam of span 6m and subjected to a UDL of 30kN/m throughout the span.	7	
O-4	(a)	OR Using Unit Load method, find the deflection at the centre for a simply	7	
Q-4	(a)	supported beam of span 8m subjected to a UDL of 30kN/m throughout the span.	,	
	(b)	A propped cantilever beam of span 4m is subjected to a UDL of 60 kN/m throughout the span. Using Castigliano's 2^{nd} theorem, find the reactions and draw Shear force and bending moment diagrams.	7	

- Q-5 (a) A prestressed concrete beam of section 300×500 mm is subjected to a 7 prestressing force of 2000 kN with an eccentricity of 100 mm from bottom. It is subjected to a live load of 20 kN/m over a span of 10 m. Calculate the stresses at top and bottom fibre at mid-span for (i) at transfer and (ii) after the application of live load. Draw bending stress distribution diagrams. Take unit weight of concrete = 24 kN/m^3 .
 - (b) State and explain Muller Breslau's principle. State the significance of 7 influence line diagram in structural analysis.

OR

- Q-5 (a) Draw influence line diagrams of reaction at A and B for a propped 7 cantilever beam AB of span 4 m with ordinate interval of 1.0 m using Muller Breslau principle.
 - (b) What are the losses in prestress? Explain any one in detail.

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