Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY ME SEMESTER – I (OLD) EXAMINATION – SUMMER 2017

Sul Sul	bject	Code: 711501N Date:08/05/20 Name: Matrix Analysis of Framed Structures	Date:08/05/2017	
Time:02:30 P.M. to 05:00 P.M. Total Mark			70	
	1. 2. 3. 4. 5.	Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks. Draw neat and clean figures with pencil only. Assume AE = 7500 kN, E = 18000 kN.m ² and GJ = 15000 kN.m ² until otherwise sta	ted.	
Q.1		Analyze the beam (Figure 1) by stiffness matrix method and plot $SF - BM$ diagram also.	14	
Q.2	(a) (b)	Derive the member stiffness matrix for truss member. Explain the nonlinear analysis in structural analysis with examples. OR	07 07	
	(b)	Derive the member stiffness matrix for beam member.	07	
Q.3		Analyze the beam (Figure 1) by Flexibility matrix method and plot SF – BM diagram also.	14	
		OR		
Q.3		Analyze the portal frame (Figure 2) by Stiffness matrix method and plot bending moment diagram only.	14	
Q.4		Analyze the plane truss (Figure 3) by Stiffness matrix method. OR	14	
Q.4		Analyze the portal frame shown in Figure 2, with considering the joints A and D are hinged, by Flexibility matrix method and plot bending moment diagram only.	14	
Q.5		Analyze the Grid (Figure 4) by Stiffness matrix method. OR	14	
Q.5	(a) (b)	Derive the transformation matrix for plane frame member. Derive the member stiffness matrix for a grid member.	07 07	

