GUJARAT TECHNOLOGICAL UNIVERSITY

	BE - SEMESTER-VI (NEW) - EXAMINATION – SUMMER 2017				
	Subject Code: 2160807 Date				
	S	ubject Name: Digital Control System			
	Time: 10:30 AM to 01:00 PM To				
	Instructions.				
	111	1 Attempt all questions			
		2. Make suitable assumptions wherever necessary.			
		3. Figures to the right indicate full marks.			
			MADIZO		
			MARKS		
Q.1		Short Questions	14		
	1	What is meant by system? And What is Command input?			
	2	What is transfer Function ?			
	3	For what purpose Laplace transform used in control system.			
	4	What is called as PID Controller?			
	5	What is Advantage of PD Controller?			
	6	Define Sampling Theorem.			
	7	Define Sample Data System.			
	8	What is Quantization?			
	9	What is Observability ?			
	10	What is Controllability?			
	11	What are the Compensator in Digital Control System?			
	12	What is Sate?			
	13	What is State Vector?			
	14	Define the Jury Stability ?			
0.2	(a)	Explain the Basic Structure of Computer-Controlled System.	03		
~·-	(b)	Explain the Jury Stability Criterion.	04		
	(\mathbf{c})	Explain the Generalized Operational Block Diagram of Feedback Control	07		
	(0)	System.	07		
		OR			
	(c)	Explain Configuration of the Basic Digital Control Scheme.	07		
0.3	(a)	Explain the various Advantages offered by Digital Control.	03		
2.0	(b)	Explain the Model of the Sample and Hold Operation.	04		
	(c)	Explain the Block Diagram of the PID Controller.	07		
	(-)	OR			
0.3	(a)	Explain the Controllability and Observability.	03		
L	(b)	Explain Mathematical Modeling of Sampling Process.	04		
	(c)	Explain the Basic Block Diagram of PLC and Explain the Ladder Diagram of	07		
	(-)	AND Function.			
Q.4	(a)	Explain the Invariance property of a state variable system.	03		
· ·	(b)	Explain the state variable Modeling and Derive the Sate Equation and Output	04		
		Equation.			
	(c)	Explain the state variable analysis for a Multi-Variable system	07		
	、 /	OR			
Q.4	(a)	Explain the Eigen Values and Eigen Vectors of a System.	03		
V 11	(b)	Explain Block Diagram of Digital Positioning System.	04		
	(c)	Explain Conversion of State variable Modals to transfer Function.	07		
	(-)	•	-		
Q.5	(a)	Steady state error for various input and output system.	03		
-	(b)	Explain Distribution Signal Rejection.	04		

	(c)	Explain the z-Domain Description of System with Dead Zone with Necessary	07
		Equation.	
		OR	
Q.5	(a)	Define following terms.	03
		1. State Vector.	
		2. State Space.	
		3. State Trajectory.	
	(b)	Explain Tunable PID Controller.	04
	(c)	Explain Digital Compensator Design using frequency response plot.	07
