Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – SUMMER • 2015

Subject Code: 163405 **Date:12/05/2015**

Subject Name: MECHATRONICS

Time:10.30AM-01.00PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Explain the design process of a Mechatronic system.	**07**
	(b)	Explain solid-state devices, which can be used electronically to switch circuit	**07**
Q.2	**(a)**	(i) Explain different types of control systems with suitable example.	**03**
		(ii) Give full form of following acronyms: AVCS,CIM,CAM,FMS	**04**
	(b)	Compare the hydraulic and pneumatic systems.	**07**
		OR	
	(b)	Describe the operation and construction of, (i) Variable displacement Vane pump (ii) Double acting Cylinder	**07**
Q.3	**(a)**	Explain Derivative control mode in details with diagram.	**07**
	(b)	Describe the following: (i) Potentiometer Displacement Sensor (ii) Bimetallic strip	**07**
		OR	
Q.3	**(a)**	Explain any one displacement sensor with neat sketch.	**07**
	(b)	Explain displacement measurement using capacitive transducer and using LVDT.	**07**
Q.4	**(a)**	What is a load cell? Explain briefly the construction and working of strain gauge load cell.	**07**
	(b)	Explain mechanical factors or aspects for motor selection in Mechatronics systems.	**07**
		OR	
Q.4	**(a)**	Explain Proportional control mode in details with diagram	**07**
	(b)	Explain single phase induction motor and its working.	**07**
Q.5	**(a)**	Explain Master and Jump controls in PLC.	**07**
	(b)	Explain following terms of Microprocessor i) ALU ii) Control unit iii) Registers iv) Program counter v) Memory address register vi) Accumulator	**07**
		OR	
Q.5	**(a)**	Explain any two types of stepper motor with suitable diagram.	**07**
	(b)	With a neat sketch Explain the Basic structure of a Programmable Logic Controller.	**07**

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