Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME-SEMESTER–I • EXAMINATION – WINTER 2014

Subject Code: 2710809 **Date:12/01/ 2015**

Subject Name: MECHATRONICS

Time: 2:30 to 5:00 Pm **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)**	What is Mechatronics? Briefly discuss the levels of Mechatronics system with example.	**07**
	(b)	State the advantages and disadvantages of Mechatronics system.	**07**
Q.2	**(a)**	Explain Linear Variable Differential Transformer (LVDT) with neat sketch.	**07**
	(b)	Explain Bourdon Tube Pressure Gauge with neat sketch.	**07**
		OR	
	(b)	Explain Linear and Rotary Potentiometers with neat sketch.	**07**
Q.3	**(a)**	Explain relay driver circuit in detail with example.	**07**
	(b)	What is a óControl Systemõ? Compare óOpen-Loopô and óClose-Loopô control system.	**07**
		OR	
Q.3	**(a)**	What is a Microprocessor? Explain all types of buses of Microprocessor.	**07**
	(b)	Design an Engine Management System using a Microprocessor.	**07**
Q.4	**(a)**	Describe the following	
		i) Types of gear train used to transmit the power.	**04**
		ii) Types of belts used to transmit the power.	**03**
	(b)	Explain principle of operation and characteristics of DC motor. Also derive the expression for back emf (e_b), voltage drop across the resistance (V) and speed (γ) for DC motor.	**07**
		OR	
Q.4	**(a)**	Explain with circuit diagram, speed control of D.C shunt, series and compound motor by flux reduction method.	**07**
	(b)	What is DC stepper motor? Explain its working and construction in detail.	**07**
Q.5	**(a)**	Write a short note on Supervisory Control and Data Acquisition (SCADA) and explain its communication methods.	**07**
	(b)	Explain basic structure of PLC.	**07**
		OR	
Q.5	**(a)**	Explain the various geometric configurations of robot with neat sketch.	**07**
	(b)	State the advantages and disadvantages of CNC Machines.	**07**

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