Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – WINTER 2013

Subject Code: 142002 **Date: 30-12-2013**

Subject Name: Basic Mechatronics

Time: 02:30 pm to 05:00 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)**	Describe the scope and role of mechatronics in industries. Also discuss the levels of mechatronics systems with example.	**07**
	(b)	Draw and explain thyristor (SCR) with construction and working with waveforms.	**07**
Q.2	**(a)**	1. Explain (i) Hysteresis (ii) Response time with neat sketches.	**04**
		2. Write short note on LED.	**03**
	(b)	With neat sketch explain orifice meter used for flow measurement with advantages and disadvantages.	**07**
		OR	
	(b)	Explain the fiber optic transducers in detail.	**07**
Q.3	**(a)**	What are the elements of a pneumatic system? Explain in brief.	**07**
	(b)	Describe strain gauge and which kind of parameter it measures.	**07**
		OR	
Q.3	**(a)**	What is the function of a pump used in hydraulic system? Discuss any one type of pump with neat sketch.	**07**
	(b)	Derive the equation for the mathematical model of permanent magnet DC motor.	**07**
Q.4	**(a)**	Briefly discuss types of cams and followers with neat sketches.	**07**
	(b)	State the types and applications of CNC machines.	**07**
		OR	
Q.4	**(a)**	Briefly discuss the types of belts used for power transmission with neat sketches.	**07**
	(b)	Classify the robots and briefly discuss any one in detail.	**07**
Q.5	**(a)**	What is stepper motor? What is stepping angle? Explain any one stepper motor with neat diagram.	**07**
	(b)	Explain relay in detail with driver circuit and at least one application. Why reverse diode is connected across the relay coil?	**07**
		OR	
Q.5	**(a)**	Give the control methods for DC shunt motor? Explain any one method.	**07**
	(b)	Explain the types of memory for microprocessor.	**07**

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