Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2013

Subject code: 710806N **Date: 06-06-2013**

Subject Name: Mechanical Engineering for Mechatronics

Time: 10.30 am – 01.00 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? Why Microprocessors are essential for it? Discuss various components of Mechatronics	**07**
	(b)	Explain working of automatic camera system with neat sketch.	**07**
Q.2	**(a)**	How to measure performance of different sensors? Enlist and explain different terms to measure performance of sensors.	**07**
	(b)	What is proximity? Explain working of principle of Eddy current proximity sensor. Discuss advantages and limitations of different proximity sensors.	**07**
		OR	
	(b)	Explain the working principle of Hall effect sensor. Discuss various hall effect sensors along with its applications.	**07**
Q.3	**(a)**	Explain Hydrostatic transmission along with advantages and limitations with neat sketch.	**07**
	(b)	What is regulating circuit? Explain with all the components.	**07**
		OR	
Q.3	**(a)**	What is DCV? Explain terminologies used in the selection of DCVs with neat sketch.	**07**
	(b)	How Hydraulic systems are better than Pneumatic systems? Discuss advantages and limitations.	**07**
Q.4	**(a)**	Classify various actuators. State the advantage of hydraulic actuators over electrical actuators.	**07**
	(b)	Explain functioning of meter in and meter out circuit along with its advantages and limitations.	**07**
		OR	
Q.4	**(a)**	Explain force current analogy and force voltage analogy. What is selection criterion for a particular analogy?	**07**
Q.4	**(b)**	Explain the working of hydraulic crane with its neat sketch.	**07**
Q.5	**(a)**	What stick slip phenomena? How it is significant for design of guide ways? Which are the factors affecting for design of guide ways?	**07**
	(b)	What is need of Hersey Diagram? Explain with neat sketch full and journal bearing.	**07**
		OR	
Q.5	**(a)**	Discuss various methods for preloading of re circulating ball screw with its merits and demerits.	**07**
	(b)	Which are the design considerations for designing slide ways and antifriction ways? Explain in detail.	**07**

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