Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – SUMMER • 2014

Subject Code: 142002 **Date: 25-06-2014**

Subject Name: Basic 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)**	(1) Give advantages and disadvantages of Mechatronics Systems.	**03**
		(2) Compare open loop and closed loop control system critically.	**04**
	(b)	Explain piezo electric transducers in detail.	**07**
Q.2	**(a)**	(1) what are the applications of CNC machines	**03**
		(2) Give the comparison NC, CNC with Conventional system.	**04**
	(b)	Define and explain Span, Accuracy and Hystresis with an example.	**07**
		OR	
	(b)	Describe the following: (1) LVDT (2) Optical Encoder (3) Proximity Sensors	**07**
Q.3	**(a)**	Describe strain gauge and which kind of parameter it measures.	**07**
	(b)	Derive the equation for the mathematical model for DC shunt motor	**07**
		OR	
Q.3	**(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**
Q.4	**(a)**	List various types of Cams and Cam followers. Explain them briefly.	**07**
	(b)	(1) Classify different types of Journal bearings and explain them briefly.	**03**
		(2) Explain control of a double acting cylinder with a suitable Pneumatic circuit.	**04**
		OR	
Q.4	**(a)**	What is Gear train? State different types of Gear trains. Describe Reverted Gear train and derive relation of Gear ratio.	**07**
	(b)	(1) Bearings are very important element in power transmission. Explain this statement.	**03**
		(2) Give comparison of Hydraulic and Pneumatic systems.	**04**
Q.5	**(a)**	Explain speed control of DC motor using full wave converter with circuit and waveform.	**07**
	(b)	Draw and explain thyristor (SCR) with construction and working with waveforms.	**07**
		OR	
Q.5	**(a)**	Give application of Microprocessor MC68HC11 or M68HC05B6.	**07**
	(b)	Explain single phase Induction motor how it is made self starting.	**07**

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