Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV EXAMINATION – WINTER 2015

Subject Code: 142002 **Date:06/01/2016**

Subject Name: Basic Mechatronics

Time: 02:30pm to 05:00pm **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)**	What do you understand by Mechatronics System? Explain the same identifying its merits and demerits.	**07**
	(b)	Considering application and other viewpoints differentiate Hydraulic and Pneumatic Systems.	**07**
Q.2	**(a)**	What is a proximity sensor? Explain briefly the optical proximity sensor.	**07**
	(b)	State different types of robots and explain any two in details.	**07**
		OR	
	(b)	Enlist the types of temperature transducers and explain any two in details.	**07**
Q.3	**(a)**	With a neat labeled sketch explain the use of a Halleffect transducer.	**07**
	(b)	Explain the single phase induction motor and methods of self starting.	**07**
		OR	
Q.3	**(a)**	Explain following terms of Microprocessor i) ALU ii) Control unit iii) Registers iv) Program counter v) Memory address register vi) Accumulator	**07**
	(b)	Describe the operation and construction of (i) Variable displacement Vane pump (ii) Double acting Cylinder	**07**
Q.4	**(a)**	State the advantage and limitation of CNC machine and discuss briefly the classification of CNC machine.	**07**
	(b)	What is idler pulley? What is its function? Compare chain, belt and gear drive.	**07**
		OR	
Q.4	**(a)**	Explain the function of cam and cam follower mechanism with a suitable example. Differentiate between compound and epicyclic gear train.	**07**
	(b)	What is a load cell? Explain briefly the construction and working of strain gauge load cell.	**07**
Q.5	**(a)**	Explain the working of a single phase induction motor.	**07**
	(b)	Explain Bipolar transistors and give detail of its operating region.	**07**
		OR	
Q.5	**(a)**	Explain construction and working of AC servo motor using a circuit diagram.	**07**
	(b)	Explain the feedback control of DC motor for velocity, velocity plus position and PID controllers.	**07**

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