

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**
