

GUJARAT TECHNOLOGICAL UNIVERSITY
B. E. - SEMESTER – IV • EXAMINATION – WINTER 2012

Subject code: 142002**Date: 31/12/2012****Subject Name: Basic Mechatronics****Time: 02.30 pm - 05.00 pm****Total Marks: 70****Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a) What is mechatronics? Briefly discuss the levels of mechatronics with example. **07**

(b) Explain and derive equation for piezo electric actuators modeling. **07**

Q.2 (a) Define sensor and transducer. Explain briefly with example. **07**

(b) Explain range, span and error with an example. **07**

OR

(b) Enlist the various position sensors and explain any one with neat sketch. **07**

Q.3 (a) What are the proximity sensors? Explain any one with neat sketch. **07**

(b) Give the comparison of NC, CNC and conventional system. **07**

OR

Q.3 (a) With neat sketch explain the components of a basic hydraulic system. **07**

(b) Compare the belt drive and gear drive. **07**

Q.4 (a) Explain the strain gauge load cells. **07**

(b) Explain the single phase induction motor and methods of self starting. **07**

OR

Q.4 (a) Explain thyristors and TRIACS with characteristics and voltage control. **07**

(b) Explain AC servo motor with its construction and working by circuit diagram **07**

Q.5 (a) Give detail of PWM (Pulse Width Modulation) and DC converter with basic circuit and waveform. **07**

(b) Explain relays with one application and why freewheeling diode is necessary. **07**

OR

Q.5 (a) Explain any three methods of speed control of induction motor. **07**

(b) Give application of Microprocessor MC68HC11 or M68HC05B6. **07**
