

GUJARAT TECHNOLOGICAL UNIVERSITY**ME Semester –I Examination Feb. - 2012****Subject code: 710806N****Date: 15/02/2012****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) Define mechatronics. Explain the concurrent integration with neat sketch. **07**
(b) Explain with neat sketch the basic sequences of the control system of an Automatic Washing Machine. **07**

- Q.2** (a) Define Hall effect. Explain the linear and threshold hall effect sensors. **07**
(b) Classify the sensors. Explain any one flow sensor with neat sketch. **07**

OR

- (b) Explain any one proximity sensor with neat sketch. **07**

- Q.3** (a) Classify the hydraulic motors. Explain bent axis piston motor. **07**
(b) Explain the stages of preparation of air in brief. **07**

OR

- Q.3** (a) Enlist the different hydraulic circuits. Explain any one in detail. **07**
(b) Explain structure of Pneumatic system. Give detail nomenclature of the cross sectional view of simple double acting pneumatic cylinder. **07**

- Q.4** (a) Present and explain system model of Spring Mass-Damper. **07**
(b) Present and explain system model for the resistance to acceleration related to Hydraulic system modeling. **07**

OR

- Q.4** (a) Present and explain the system model of rotary actuator. **07**
(b) Present and explain the system model of direction control valve. **07**

- Q.5** (a) Give the detail classification of Guide ways. Write the basic principles of design for strength & for rigidity of machine tool structures. **07**
(b) Explain Planetary Roller Screw with neat sketch. Mention its advantages. **07**

OR

- Q.5** (a) Explain Hersey Diagram. Sketch full and journal bearing **07**
(b) Enlist the functions of the spindles. Explain steep taper. **07**
