

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Semester-I Examination January 2010

Subject code: 710806**Subject Name: Mechanical Engineering For Mechatronics****Date: 29 / 01 / 2010****Time: 12.00 – 2.30 pm****Total Marks: 60****Instructions:**

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

- Q.1** (a) Define Mechatronics stating its objectives. State need for Mechatronics in Industries. **06**
- (b) Explain Engine Management System showing block diagram of Engine Management Controller. Compare the Mechatronics Approach and Conventional Approach in Engine Management. **06**
- Q.2** (a) Define transducer. State its examples and parameters sensed. **06**
- (b) Explain with sketch Hall Effect Sensors stating principle, types, construction, advantages, disadvantage and applications. **06**
- OR**
- (b) State desirable features for Sensors and Transducers. Describe with sketch Optical Sensor. **06**
- Q.3** (a) Sketch and explain the constructional features of Hydraulic Cylinder. Classify the hydraulic cylinder. **06**
- (b) Classify Hydraulic valves. Sketch and explain construction, working and application features of Direction Control Valves. **06**
- OR**
- Q.3** (a) List and explain the components of Pneumatic system. State applications of Pneumatic systems. **06**
- (b) Sketch and explain the construction and working of Swash plate hydraulic motor stating features, application and selection parameters. **06**
- Q.4** (a) Present and explain system model of Spring Mass-Damper. **06**
- (b) Present and explain system model of the Temperature Controller. **06**
- OR**
- Q.4** (a) Present and explain system model of rack and pinion arrangement **06**
- (b) Present and explain system model of R-L-C circuit **06**
- Q.5** (a) What are the types of machine tool structure? State its design and load considerations. **06**
- (b) Explain the principle of Slide ways and Antifriction ways. What is the stick-slip phenomenon? **06**
- OR**
- Q.5** (a) Explain Hydrostatic and Hydrodynamic slide ways stating their features. **06**
- (b) Explain the functions of spindle and spindle bearings. Sketch and explain the types of spindle noses **06**