

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV • EXAMINATION – SUMMER • 2014****Subject Code: 142002****Date: 25-06-2014****Subject Name: Basic 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) (1) Give advantages and disadvantages of Mechatronics Systems. **03**
(2) Compare open loop and closed loop control system critically. **04**
(b) Explain piezo electric transducers in detail. **07**
- Q.2** (a) (1) what are the applications of CNC machines **03**
(2) Give the comparison NC, CNC with Conventional system. **04**
(b) Define and explain Span, Accuracy and Hysteresis with an example. **07**
- OR**
- (b) Describe the following: **07**
(1) LVDT (2) Optical Encoder (3) Proximity Sensors
- Q.3** (a) Describe strain gauge and which kind of parameter it measures. **07**
(b) Derive the equation for the mathematical model for DC shunt motor **07**
- OR**
- Q.3** (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**
- Q.4** (a) List various types of Cams and Cam followers. Explain them briefly. **07**
(b) (1) Classify different types of Journal bearings and explain them briefly. **03**
(2) Explain control of a double acting cylinder with a suitable Pneumatic circuit. **04**
- OR**
- Q.4** (a) What is Gear train? State different types of Gear trains. Describe Reverted Gear train and derive relation of Gear ratio. **07**
(b) (1) Bearings are very important element in power transmission. Explain this statement. **03**
(2) Give comparison of Hydraulic and Pneumatic systems. **04**
- Q.5** (a) Explain speed control of DC motor using full wave converter with circuit and waveform. **07**
(b) Draw and explain thyristor (SCR) with construction and working with waveforms. **07**
- OR**
- Q.5** (a) Give application of Microprocessor MC68HC11 or M68HC05B6. **07**
(b) Explain single phase Induction motor how it is made self starting. **07**
