

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV • EXAMINATION – WINTER • 2014****Subject Code: 142002****Date: 02-01-2015****Subject Name: Basic Mechatronics****Time: 02:30 pm - 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) What is a 'control system'? Briefly explain types of control systems with an example, advantages and disadvantages. **07**
- (b) Explain construction of Silicon Controlled Rectifier (SCR) with working and its waveform. **07**
- Q.2** (a) Briefly explain (i)Hysteresis(ii)Overshoot(iii)Response time **07**
- (b) Write short note on 'Working of Bourdon tube pressure gauge'. **07**
- OR**
- (b) Derive equation for mathematical model of PMDC (Permanent Magnet DC) motor. **07**
- Q.3** (a) What are various 'displacement sensors' used in a measurement system? Explain any one giving neat sketch. **07**
- (b) Elaborate 'single phase induction motor'. How to make it 'self-start'? **07**
- OR**
- Q.3** (a) Briefly explain (i) spring balance (ii) proving ring used for force measurement. **07**
- (b) Explain working of relay with constructional diagrams. **07**
- Q.4** (a) Explain with neat sketch, the components of a hydraulic system. **07**
- (b) Compare the NC, CNC with the conventional system of manufacturing. **07**
- OR**
- Q.4** (a) Briefly explain with neat sketch, the components of a pneumatic system. **07**
- (b) How the gears are classified? Briefly explain with neat sketches. **07**
- Q.5** (a) What is a 'stepper motor'? Explain working of it with neat diagram. **07**
- (b) Explain inductive transducer. **07**
- OR**
- Q.5** (a) Explain any one method of 'DC motor control'? **07**
- (b) Write short note on (i)LED (ii)Strain gauge **07**
