

**GUJARAT TECHNOLOGICAL UNIVERSITY****B. E. Sem-IV Examination June- 2011****Subject code: 142002****Subject Name: BASIC MECHATRONICS****Date: 13/06/2011****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) Explain control of permanent magnet Stepper motor. **07**  
 (b) Briefly discuss the levels of modern mechatronics system & give examples of each. **07**

**Q.2** (a) Compare the hydraulic and pneumatic systems. **07**  
 (b) Explain the characteristics of diodes, thyristors & triacs. **07**

**OR**

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

**Q.3** (a) Draw the simulink model of PMDC motor using data given below:  $A_u = 0.303$ ,  $A_o = 0.02$ ,  $BT = 33333$ ,  $B_i = 500$ ,  $B_o = 0$ ,  $U_s = 10V$ ,  $BL = 0.00001$  Nms/Rad. **07**

(b) Give broad classification of a DC Motor. **07**

**OR**

**Q.3** (a) Draw basic block diagram of 8085 microprocessor. **07**

(b) Explain following terms of Microprocessor **07**

- i) ALU
- ii) Control unit
- iii) Registers
- iv) Program counter
- v) Memory address register
- vi) Accumulator

**Q.4** (a) Explain the types of gears with neat sketches. **07**

(b) Explain in detail the working, applications, advantages & disadvantages of any one by the temperature sensors with neat sketches. **07**

**OR**

**Q.4** (a) Write a short note on CNC machines stating types, major elements of CNC machine, advantages and applications. **07**

**Q.4** (b) Write short note on velocity sensors and explain any one with neat sketches. **07**

**Q.5** (a) Explain single phase induction motor and its working. **07**

(b) Explain any one of the force sensors. **07**

**OR**

**Q.5** (a) Explain any one of the motion sensors. **07**

(b) Explain strain gauge load cell. **07**

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