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10ME65

Sixth Semester B.E. Degree Examination, Dec.2015/Jan.2016

**Mechatronics and Microprocessor**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting at least TWO questions from each part.**

**PART – A**

- 1
  - a. Define mechatronics. What are the advantages and disadvantages of mechatronics? (05 Marks)
  - b. Explain with a block diagram the working of a digital camera. (10 Marks)
  - c. Discuss basic elements of a closed-loop system. (05 Marks)
- 2
  - a. Explain static and dynamic characteristics of sensors. (08 Marks)
  - b. Explain working principle of Hall effect sensor. (06 Marks)
  - c. Define following terms:
    - i) Hysteresis error
    - ii) Repeatability
    - iii) Non-linearity error
 (06 Marks)
- 3
  - a. Discuss any four solid state switches. (10 Marks)
  - b. What is stepper motor? Explain various types of stepper motor. (10 Marks)
- 4
  - a. Explain inverting and non-inverting op-amps with a neat sketch. (10 Marks)
  - b. With a neat sketch, discuss basic elements used in analog to digital converter. (10 Marks)

**PART – B**

- 5
  - a. State and prove De-Morgan's theorem. Also draw the logic circuit for the same. (08 Marks)
  - b. Explain any six laws of Boolean algebra. (06 Marks)
  - c. With the help of symbols and truth table, explain XOR and NAND gate. (06 Marks)
- 6
  - a. What are the differences between microprocessors and microcontrollers? (04 Marks)
  - b. Explain with a neat sketch of architecture 8085 microprocessor. (10 Marks)
  - c. Explain the following terminology related to microprocessor:
    - i) Interrupts
    - ii) RAM
    - iii) Assembler
 (06 Marks)
- 7
  - a. Discuss classification of instruction sets of 8085 microprocessor. (10 Marks)
  - b. What are buses? Explain types of buses. (08 Marks)
  - c. List any four applications of microprocessor. (02 Marks)
- 8
  - a. Explain with a neat diagram of the flow of data word and instrumentation word. (10 Marks)
  - b. Draw and explain timing diagram for memory write operation. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.