USN | | | | | | | | | |

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)**

* * * * *