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06ME64

Sixth Semester B.E. Degree Examination, June/July 2013
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. **(02 Marks)**
   b. How has mechatronics discipline been evolved? Briefly explain various evolution stages. **(08 Marks)**
   c. With a block diagram, briefly explain the generalized measurement system. **(05 Marks)**
   d. Show with a neat diagram, the different elements of a closed-loop control system. **(05 Marks)**

2 a. Distinguish between a transducer and sensor. **(02 Marks)**
   b. Explain the principle of working of proximity sensors. **(12 Marks)**
   c. Discuss the principle of working of Hall effect sensors. **(06 Marks)**

3 a. What are solid state switches? Discuss briefly any two types of solid state switches. **(10 Marks)**
   b. What are stepper motors? What are the performance characteristics of a stepper motor? **(04 Marks)**
   c. Explain with a neat sketch, the principle of working of a hybrid stepper motor. **(06 Marks)**

4 a. Define signal conditioning. What are the necessity for signal conditioning? **(04 Marks)**
   b. Define the following filters with frequency versus gain curve:
      i) Low pass   ii) High pass   iii) Band pass   iv) Band stop **(12 Marks)**
   c. What are the characteristics of an ideal operational amplifier? **(04 Marks)**

PART – B

5 a. Discuss briefly with a block diagram, organization of a typical microcomputer system. **(08 Marks)**
   b. Briefly explain the following:
      i) Representation of floating point numbers.
      ii) Accuracy and range of floating point representation. **(08 Marks)**
   c. With the help of symbol and truth table, explain AND gate. **(04 Marks)**

6 a. What is a microprocessor? **(02 Marks)**
   b. Explain the function of each of the following related to microprocessor:
      i) Accumulator   ii) Program counter
      iii) Instruction register   iv) Flag register **(08 Marks)**
   c. Discuss the functions of the following signals of 8085:
      i) $\overline{RD}$ ii) $\overline{WR}$ iii) $\overline{INTA}$ iv) HOLD   v) INTR   vi) IO/$\overline{M}$ **(06 Marks)**
   d. Draw the timing diagram for fetch operation. **(04 Marks)**

7 a. Explain with a block diagram, the internal architecture of 8085 microprocessor. **(10 Marks)**
   b. Write an assembly program to add two 8 bit numbers. The first number 49H is in the memory location 2501H and the second number 56H is in the memory location 2502H. The result is to be stored in the memory location 2503H. The numbers are presented in hexadecimal system. **(06 Marks)**
   c. What are the advantages of assembly language over machine language? **(04 Marks)**

8 Write short notes on: a. Instruction and data flow;   b. Micro controllers;   c. Memory read cycle; d. Instruction set for Intel 8085 microprocessor. **(20 Marks)**

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