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10ME65

**Sixth Semester B.E. Degree Examination, Dec.2014/Jan.2015**  
**Mechatronics & 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. List the advantages and disadvantages of mechatronics. (04 Marks)
  - b. Explain briefly elements of closed loop control system with a example. (08 Marks)
  - c. Explain with the block diagram, how a microprocessor control system is used to control the focusing and exposure in an automatic camera. (08 Marks)
2.
  - a. Define the following terms: i) Hysteresis error ii) Accuracy (04 Marks)
  - b. What is hall effect? Explain the principle of hall effect with neat sketch. (08 Marks)
  - c. Explain how sensing is achieved by an incremental optical encoder. Write its applications. (08 Marks)
3.
  - a. What is an actuator? Name any four important solid state switches and explain each in brief. (10 Marks)
  - b. Write and explain non-permanent magnet type DC motors with schematic diagrams. (10 Marks)
4.
  - a. Define signal conditioning, what are the necessity for signal conditioning. (04 Marks)
  - b. Explain balance mode of wheat stone bridge and hence deduce the expression for change in output voltage. (10 Marks)
  - c. With block diagram, explain data acquisition system. (06 Marks)

PART – B

5.
  - a. Explain the concept of overflow and underflow with an example. (04 Marks)
  - b. What is logic gate? Explain AND, OR, NOR and NAND gates with symbols and truth tables. (10 Marks)
  - c. Convert the following:
    - i)  $(3FD)_{16} = (\quad)_{10}$
    - ii)  $(2509)_{10} = (\quad)_{16}$
    - iii)  $(475.25)_{10} = (\quad)_{10}$
    - iv)  $(1101.1)_2 = (\quad)_{10}$  (06 Marks)
6.
  - a. What are micro-controllers? Distinguish between a micro-processor and micro-controllers. (06 Marks)
  - b. Explain with a neat sketch. The internal architecture of Intel 8085 microprocessor. (14 Marks)
7.
  - a. Briefly explain the classification of instructions provided by 8085. (10 Marks)
  - b. Write a program for multiply two 8-bit numbers stored in memory locations 2200 H and 2201 H. Store the result in memory locations 2300 H and 2301 H. (10 Marks)
8.
  - a. Explain the flow of instruction and data in the 8085 microprocessor. (10 Marks)
  - b. List the four operations performed by CPU. (04 Marks)
  - c. Distinguish between instruction cycle, machine cycle and T-state. (06 Marks)

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