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**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)  $(3509)_{10} = (\quad)_{16}$   
iii)  $(475.25)_8 = (\quad)_{10}$   
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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