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10ME65

**Sixth Semester B.E. Degree Examination, Jan./Feb.2021**  
**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. Discuss advantages and disadvantages of Mechatronics system. (05 Marks)  
b. Briefly explain the elements of closed loop control system. (06 Marks)  
c. Explain with the block diagram, working of the washing machine. (09 Marks)
- 2 a. Explain static and dynamic characteristics of sensors. (06 Marks)  
b. Explain the principle of Hall effect sensor with example. (08 Marks)  
c. Explain capacitive element sensor. (06 Marks)
- 3 a. Explain Permanent magnet type DC motor with schematic diagram. (08 Marks)  
b. Name any four solid state switches and explain each in brief. (12 Marks)
- 4 a. With block diagram, explain data acquisition system. (10 Marks)  
b. Explain inverting and non-inverting op-amp with a neat sketch. (10 Marks)

**PART – B**

- 5 a. With the help of symbol and truth table, explain AND, OR, XOR and NAND gates. (08 Marks)  
b. Convert the following:  
(i)  $(154)_{10} = (\text{---})_2 = (\text{---})_{16}$   
(ii)  $(10001011)_2 = (\text{---})_{16}$ . (03 Marks)  
c. State and prove De-Morgan's theorem. Also draw the logic circuit for the same. (09 Marks)
- 6 a. With a neat sketch, explain internal architecture of Intel 8085 processor. (14 Marks)  
b. What are the differences between microprocessors and microcontrollers? (06 Marks)
- 7 a. Explain different types of instruction sets of 8085 microprocessor. (12 Marks)  
b. What are Buses? Explain types of Buses available in 8085 microprocessor. (08 Marks)
- 8 a. Draw and explain the timing diagram for memory write operation. (10 Marks)  
b. Draw and explain flow of instruction word and data word. (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.