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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) $(154)_{10} = (\underline{\hspace{1cm}})_2 = (\underline{\hspace{1cm}})_{16}$
       (ii) $(10001011)_2 = (\underline{\hspace{1cm}})_{16}$ **(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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