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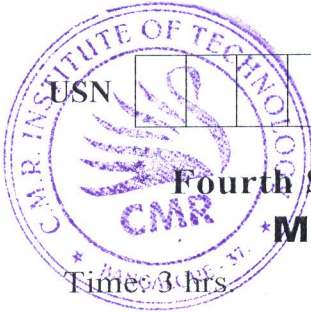### Fourth Semester B.E. Degree Examination, Dec.2023/Jan.2024
Microcontroller and Embedded Systems

Time: 3 hrs.   Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1   a.   Explain with neat diagram, about ARM core data flow model.   (10 Marks)
    b.   Define RISC architecture. Compare with CISC processors.   (10 Marks)

OR

2   a.   Define pipelining? Explain how it helps the program execution.   (10 Marks)
    b.   Explain the major design rules related to RISC philosophy implementation. (10 Marks)

Module-2

3   a.   Write a program to find sum of first 20 integer numbers.   (10 Marks)
    b.   Explain about load store instructions in ARM with example.   (10 Marks)

OR

4   a.   Write a program to find the factorial of a number.   (10 Marks)
    b.   Write a program to find largest and smallest number in an array of 16 numbers. (10 Marks)

Module-3

5   a.   Write a program to arrange a series of 32 bit numbers in ascending/descending order.
                                                                                 (10 Marks)
    b.   What are the different types of memories used in Embedded system design? (10 Marks)

OR

6   a.   Write a program to count the number of ones and zeros in two consecutive memory locations. (10 Marks)
    b.   Write a program to display 'Microcontroller' message using Internal UART. (10 Marks)

Module-4

7   a.   Explain classification of embedded systems.   (10 Marks)
    b.   Write a program and explain about interface of DC motor.   (10 Marks)

OR

8   a.   Explain the characteristics of embedded systems.   (10 Marks)
    b.   Write a program to demonstrate the use of external interrupt to toggle an LED on/off. (10 Marks)

Module-5

9   a.   With neat diagram, explain operating system architecture.   (10 Marks)
    b.   Explain steps involved in selecting RTOS.   (10 Marks)

OR

10 a.   Explain the concept of dead lock with example.   (10 Marks)
    b.   Explain types of operating systems with example.   (10 Marks)

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