21CS43

USN

Fourth Semester B.E. Degree Examination, June/July 2023
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. Mention the differences between:
    (i) Microprocessor and Microcontrollers   (ii) CISC and RISC   **(10 Marks)**
    b. With a neat diagram, explain embedded system hardware.   **(10 Marks)**

OR

2   a. Explain in detail about Current Program Status Register (CPSR).   **(10 Marks)**
    b. With a neat diagram, explain embedded system software.   **(10 Marks)**

Module-2

3   a. Explain different branch instruction in ARM processor.   **(10 Marks)**
    b. Discuss different types of addressing modes for load store multiple instructions with example.   **(10 Marks)**

OR

4   a. Explain single register load store addressing mode syntax, table, index mode with an example.   **(10 Marks)**
    b. Discuss SWAP instruction with an example.   **(10 Marks)**

Module-3

5   a. Write a C program that prints the square of the integers between 0 to 9 using functions and explain how to convert this C function to an assembly function with command.   **(10 Marks)**
    b. Discuss how instruction is scheduled in ARM.   **(10 Marks)**

OR

6   a. Explain code optimization, profiling and cycle counting.   **(10 Marks)**
    b. Discuss how Registers are allocated to optimize the program.   **(10 Marks)**

Module-4

7   a. Explain the purpose of embedded systems used in various domains.   **(10 Marks)**
    b. Write a note on core of the embedded systems.   **(10 Marks)**

OR

8   a. Explain different classification of embedded system. Give an example for each.   **(10 Marks)**
    b. Write a note on sensors and actuators used in various embedded systems.   **(10 Marks)**

Module-5

9   a. Explain multi threading.   **(06 Marks)**
    b. Explain the concept of deadlock with a neat diagram.   **(04 Marks)**
    c. Write a note on message passing.   **(10 Marks)**

OR

10 a. Write a note on multiprocessing and multi-tasking.   **(10 Marks)**
    b. Explain the role of Integrated Development Environment (IDE) for Embedded Software Development.   **(10 Marks)**

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