

CBCS SCHEME

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21CS43

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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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.