



CBCS SCHEME

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18CS44

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. Explain the architecture of an ARM based embedded device with the help of neat diagram. (08 Marks)
- b. Describe the RISC design philosophy with four design rules. (06 Marks)
- c. Discuss about embedded system software. (06 Marks)

OR

- 2 a. With neat diagram, explain current program status register. (10 Marks)
- b. What is pipeline in ARM? Illustrate with an example, the pipeline stage of ARM 9 and ARM 10. (10 Marks)

Module-2

- 3 a. Explain BARREL shifter instructions in ARM with suitable examples. (10 Marks)
- b. Explain the following with examples: (10 Marks)
 - (i) RSC
 - (ii) MLA
 - (iii) STRH
 - (iv) SWP

OR

- 4 a. Discuss about how to convert a C function to an assembly code with an example. (10 Marks)
- b. Write ARM assembly language program to add two 32 bit numbers. (10 Marks)

Module-3

- 5 a. Differentiate between RISC and CISC processor/controller. (06 Marks)
- b. Classify embedded systems based on performance, complexity and generation. (08 Marks)
- c. Explain the different purposes of embedded systems. (06 Marks)

OR

- 6 a. Differentiate between Microprocessor and Microcontroller. (06 Marks)
- b. Explain the concept of 7-segment LED display. (06 Marks)
- c. Discuss about the different stepping mode supported by stepper motor. (08 Marks)

Module-4

- 7 a. With a neat block diagram, explain design and working of washing machine. (10 Marks)
- b. Write about domain specific aspect of embedded systems in automatic industry. (10 Marks)

OR

- 8 a. With FSM model, explain the design an automatic tea/coffee vending machine. (10 Marks)
- b. Explain super loop based approach of embedded system. (06 Marks)
- c. Write down the advantage and drawbacks of assembly language based development. (04 Marks)

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.

Module-5

- 9 a. Draw the diagram of process states and explain the same. (08 Marks)
b. Discuss about the threads in the operating system context. (08 Marks)
c. Differentiate thread and process. (04 Marks)

OR

- 10 a. Explain the concept of deadlock with neat diagram. Mention the different conditions with favour a deadlock situation. (10 Marks)
b. Write a note on semaphore. (10 Marks)
