



# CBCS SCHEME

15EC62

## Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020 ARM Microcontroller & Embedded Systems

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. Explain the architecture of ARM cortex – M3 processor with the help of neat block diagram. (10 Marks)  
b. List and explain the features of ARM cortex M3 processor. (06 Marks)

OR

- 2 a. Explain the operation modes and privilege levels in cortex M3 processor. (08 Marks)  
b. Explain two stack model and reset sequence in ARM cortex M3. (08 Marks)

### Module-2

- 3 a. Explain the following instruction with examples:  
(i) ASR (ii) LSL (iii) ROR (iv) REV (08 Marks)  
b. Briefly explain bit band operations and memory map of cortex M3. (08 Marks)

OR

- 4 a. Write a note on barrier instruction in cortex M3. (06 Marks)  
b. With a diagram, explain the organization of CMSiS and its benefits. (10 Marks)

### Module-3

- 5 a. Define embedded systems. Explain the 6 purpose of embedded systems with an example for each. (08 Marks)  
b. Explain the classification of embedded systems based on generation. (04 Marks)  
c. Mention the application of embedded system with an example for each. (04 Marks)

OR

- 6 a. Explain the different 'on board' communication interfaces in brief. (08 Marks)  
b. Write a note on: (i) Reset circuit (ii) Watch dog timer. (08 Marks)

### Module-4

- 7 a. Explain the different characteristics of embedded system in detail. (08 Marks)  
b. With a block diagram, mention the components and in the design of a washing machine and also explain its working. (08 Marks)

OR

- 8 a. What is hardware and software co-design? Explain the fundamental design approaches in detail. (10 Marks)  
b. With FSM model, explain the design and operation of automatic tea/coffee vending machine. (06 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. Define process. Explain in detail the structure, memory organization and state transitions of the process. (08 Marks)
- b. Explain multi processing, multi tasking and multi programming. (08 Marks)

OR

- 10 a. Explain the simulator and emulator. (08 Marks)
- b. Write a note on message passing. (08 Marks)

\* \* \* \* \*