



CBCS SCHEME

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18EC62

Sixth Semester B.E. Degree Examination, June/July 2024 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 ARM Cortex-M3 processor with the help of a neat block diagram. (07 Marks)
- b. List the application of ARM Cortex-M3 processor. (07 Marks)
- c. Discuss the function of R₀ to R₁₅ and other special registers in Cortex-M3 processor. (06 Marks)

OR

- 2 a. Explain ARM Cortex M3 program status registers in detail. (08 Marks)
- b. Explain stack push and pop operation in Cortex-M3 with the help of a neat diagram. (06 Marks)
- c. Explain and draw the organization memory map. (06 Marks)

Module-2

- 3 a. Explain the following instruction with an example:
(i) DMB (ii) RBIT (iii) UBFX (iv) BRC (08 Marks)
- b. List and explain the function of any four data process and four branch instructions in ARM Cortex-M3 with an example. (08 Marks)
- c. Write an ALP to find the sum of first 10 integer numbers. (04 Marks)

OR

- 4 a. Write a note on the CMSIS. (08 Marks)
- b. Explain any two methods of accessing memory mapped registers (assembly code) in Cortex-M3. (06 Marks)
- c. List and explain the function of any four commonly used memory access instructions in Cortex-M3 processor. (06 Marks)

Module-3

- 5 a. Explain the components of typical embedded system in detail. (08 Marks)
- b. Write notes on the following:
(i) I2C (ii) IrDA (iii) Opto couple (iv) I - wire interface (08 Marks)
- c. Differentiate between RISC and CISC architecture. (04 Marks)

OR

- 6 a. Explain the different on-board communication interface in brief. (08 Marks)
- b. What are the different types of memories used in embedded system design? Explain role of each. (08 Marks)
- c. Differentiate between Harvard and Von-Neumann architecture. (04 Marks)

Module-4

- 7 a. Explain the different characteristics of embedded system in detail. (08 Marks)
b. Explain the operational quality attributes of an embedded system. (06 Marks)
c. Explain the different embedded firmware design approaches in detail. (06 Marks)

OR

- 8 a. Explain the important non-operational attributes to be considered in any embedded system. (08 Marks)
b. What is Hardware and Software co-design? Explain the fundamental design approach in detail. (08 Marks)
c. Compare DFG and CDFG with an example and diagrams. (04 Marks)

Module-5

- 9 a. Briefly explain the function of the OS with a diagram. (10 Marks)
b. Write a block schematic of IDE environment for ESD and explain their function in brief. (10 Marks)

OR

- 10 a. Explain the terms process, task, threads. (08 Marks)
b. Explain briefly about simulator, emulator and debugging techniques. (12 Marks)
