

CBBCS SCHEME

21EC52



Fifth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026 Computer Organization and ARM Microcontroller

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. With neat diagram explain the basic connection between Processor and Memory. (06 Marks)
- b. Explain the computer basic performance equation by mentioning each parameter into equation. (06 Marks)
- c. Explain : (i) Nested Interrupt (ii) Daisy – Chain Method. (08 Marks)

OR

- 2 a. With neat diagram explain the operation of DMA controller. (06 Marks)
- b. What is Bus Arbitration? Explain centralized and distributed arbitration scheme with diagram. (09 Marks)
- c. Explain PCI bus along with data transfer signals. (05 Marks)

Module-2

- 3 a. Explain internal organization of memory chip with an example. (06 Marks)
- b. Illustrate SRAM Cell Structure. (06 Marks)
- c. Define Cache Memory. Explain Direct-mapped cache technique with diagram. (08 Marks)

OR

- 4 a. Illustrate the control sequence for execution of the instruction Add (R₃), R₁ in the processor. (06 Marks)
- b. Explain microprogrammed control unit with suitable diagram. (08 Marks)
- c. Describe basic concepts of pipelining. (06 Marks)

Module-3

- 5 a. Discuss implementation philosophy of RISC with four major design rules. (06 Marks)
- b. Categorize various AMBA bus protocol used in ARM processor with their performance characteristics. (06 Marks)
- c. With neat diagram explain ARM based embedded device (Microcontroller) with four main hardware components. (08 Marks)

OR

- 6 a. Explain ARM core data flow model with neat diagram. (08 Marks)
- b. Give the schematic of current program status register of ARM processors with bit field configuration. (06 Marks)
- c. Explain in brief Exceptions, Interrupts and the Vector Table. (06 Marks)

Module-4

- 7 a. What is the need of barrel shifter in ARM processor? List and explain various barrel shifter operations. (06 Marks)
- b. Brief about the categories of Load-Store instructions used with ARM. (06 Marks)
- c. Explain with example the following 32-bit instruction of ARM processor:
(i) CMN (ii) MLA (iii) CLZ (iv) BIC (08 Marks)

OR

- 8 a. Explain the ARM swap instruction with an example code. (06 Marks)
- b. Write an ALP to multiply two 16-bit binary numbers. (06 Marks)
- c. Explain about Loading Constants and Conditional Execution with example. (08 Marks)

Module-5

- 9 a. Discuss about thumb register usage in ARM processor. (06 Marks)
- b. Explain ARM-Thumb interworking with an example. (06 Marks)
- c. Write a short notes on STACK instruction and SOFTWARE INTERRUPT instruction. (08 Marks)

OR

- 10 a. List out and explain the basic C data types. (06 Marks)
- b. Discuss using C and assembly program, how descending loop improve the performance compared with the incrementing loop. (08 Marks)
- c. Explain Loop unrolling with an example. (06 Marks)

CMRIT LIBRARY
BANGALORE - 560 037
