

# CBCS SCHEME

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21EC52

## Fifth Semester B.E./B.Tech. Degree Examination, June/July 2025 Computer Organization and ARM Microcontrollers

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 performance of a processor  
i) Processor clock ii) Basic performance equation iii) Clock rate. (06 Marks)  
b. Discuss the 8-bit parallel port input interface circuit with a neat diagram. (08 Marks)  
c. Explain the PCI bus in brief for read operation along with the timing diagram. (06 Marks)

OR

- 2 a. Describe the various addressing modes give one example for each mode. (10 Marks)  
b. With respect to handling interrupts from multiple devices, explain  
i) interrupt priority ii) daisy chain method. (10 Marks)

### Module-2

- 3 a. Explain in detail the synchronous DRAM structure with a neat diagram. (10 Marks)  
b. Describe the hardwired computer with an example. (10 Marks)

OR

- 4 a. Explain with a neat diagram fetching a word from memory and storing a word in memory. (10 Marks)  
b. Explain the single bus organization of the data path inside a processor with a neat diagram. (10 Marks)

### Module-3

- 5 a. Explain an ARM based embedded device with a neat diagram and also discuss the AMBA bus protocols. (10 Marks)  
b. What is CPSR? Explain the banked registers in detail. (10 Marks)

OR

- 6 a. Explain the ARM core dataflow model with a neat diagram and also discuss the ARM registers. (10 Marks)  
b. Explain the conditional code flag in ARM processor. (05 Marks)  
c. Differentiate between Von Neumann architecture and Harvard architecture. (05 Marks)

### Module-4

- 7 a. What is Barrel shifter? Explain all the Barrel shifter instructions with an example for each instruction. (10 Marks)  
b. Explain the following instructions with syntax and give an example for each  
i) LDM ii) STMIA iii) ADR iv) BIC v) SWI. (10 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.

OR

- 8 a. Explain the program status register instructions in detail. Give one example for each instruction. (05 Marks)
- b. Illustrate the pre-indexing and post indexing instruction of ARM. (05 Marks)
- c. Explain the following instruction with syntax give a example for each  
i) MLA ii) BL iii) LDRB iv) STRH v) SWP. (10 Marks)

**Module-5**

- 9 a. Explain the three C looping structures in detail. (10 Marks)
- b. Explain the basic C data types in detail. (05 Marks)
- c. Write an ALP to find the sum of first 10 integer numbers. (05 Marks)

OR

- 10 a. What are the issues that encounter when porting C code to the ARM code. (05 Marks)
- b. Write an ALP to find the largest number in an array of 32 numbers. (05 Marks)
- c. Write a note on:  
i) Pointer Aliasing  
ii) Bit Fields. (10 Marks)

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