EPCET LIBRARY BANGALORE-49

CBCS SCHEME

USN | | | | | | | | | | |

21EC52

Fifth Semester B.E./B.Tech. Degree Examination, June/July 2026
Computer Organization and ARM Microcontrollers

Time: 3 hrs. Max. Marks: 100

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

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-1

1 a. Discuss operational concept in a computer highlighting role of PC, MAR, MDR and IR registers. **(10 Marks)**

b. Write basic performance equation indicating role of each parameter in equation. **(06 Marks)**

c. Explain how SPEC rating is computed for performance measurement and also mention overall SPEC rating for computer. **(04 Marks)**

OR

2 a. Explain I/O interface for input device and write a program that reads one line from keyboard stored in memory buffer and echoes it back to display. **(08 Marks)**

b. Describe concept of interrupt in computer. **(04 Marks)**

c. Explain 8-bit parallel interface circuit with diagram. **(08 Marks)**

Module-2

3 a. Describe the organization of 2m × 8 dynamic memory chip with diagram. **(08 Marks)**

b. Explain different types of read only memories. **(06 Marks)**

c. Describe different types of cache mapping techniques. **(06 Marks)**

OR

4 a. Discuss single bus organization of data path inside a processor. **(08 Marks)**

b. Illustrate sequence required to execute the instruction Add (R_3), R_1. **(06 Marks)**

c. Sketch the micro-programmed control unit and branch < 0 write micro-routine for instruction. **(06 Marks)**

Module-3

5 a. Explain ARM based embedded device with diagram. **(08 Marks)**

b. Describe RISC design philosophy with four design rules. **(04 Marks)**

c. Discuss embedded system software with diagram. **(08 Marks)**

OR

6 a. Explain various functional unit of ARM with help of ARM core dataflow model. **(10 Marks)**

b. Sketch basic layout of generic program status register and explain various fields. **(10 Marks)**

Module-4

7 a. Explain single register load-store index methods with example. **(06 Marks)**

b. Discuss branch instructions and write a program for forward and backward branching. **(08 Marks)**

c. Describe the following instruction with example :
i) LSL ii) MOV iii) SWI. **(06 Marks)**

OR

8 a. Discuss different SWAP instruction with example. **(06 Marks)**

b. Explain co-processor instructions of ARM processor. **(06 Marks)**

c. Write an assembly language program to find sum of first 10 integer numbers. **(08 Marks)**

Module-5

9 a. Explain ARM Thumb internetworking with instructions. **(08 Marks)**

b. Discuss stack instructions with example. **(06 Marks)**

c. Describe the following instruction with example :
i) ROR ii) MUN iii) BIC. **(06 Marks)**

OR

10 a. Explain why char data type should be avoided for local variables using code to find checksums of data packet containing 64 words. **(10 Marks)**

b. Discuss loops using a variable number of iterations with example and show that do_while loop gives better performance and code density than for-loop. **(10 Marks)**

* * * * *