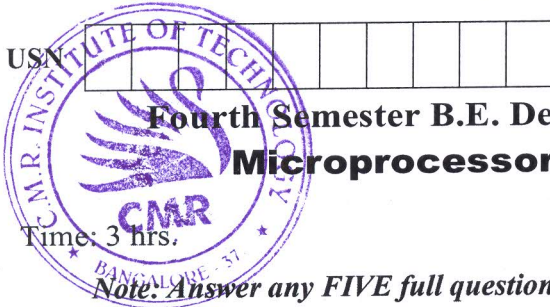


# CBCS SCHEME



USN

17CS44

Fourth Semester B.E. Degree Examination, June/July 2023

**Microprocessors and 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 internal architecture of 8086/8088 with neat diagram with register details in brief. (10 Marks)
- b. Explain stack operations in brief and show the contents of the stack as each of the following instruction executed with relevant diagram.  
PUSH AX  
PUSH DI  
PUSH DX  
(Assume that SP = 1236, AX = 24B6, DI = 85C2 and DX = 5F93) (06 Marks)
- c. Explain the bits of FLAG Register. (04 Marks)

OR

- 2 a. Explain any four addressing modes with example. (08 Marks)
- b. What are assembler directives? Explain the following assembler directives with an example:  
i) Model      ii) DB      iii) ORG (07 Marks)
- c. Write an Assembly Language Program to show an addition, multiplication, subtraction and division of 16-bit numbers. (05 Marks)

## Module-2

- 3 a. Explain the following instructions with an example:  
i) ADC      ii) INC      iii) CMP      iv) AAM  
v) TEST      vi) SAR      vii) AAA      viii) SHL (12 Marks)
- b. Explain Rotate instructions of all the four types. (06 Marks)
- c. Explain AND and OR Logical instruction. (02 Marks)

OR

- 4 a. What is an interrupt? Explain various types with an interrupt vector table. (10 Marks)
- b. Write a program that (i) Clears the screen and (ii) sets the cursor at the center of the screen. (06 Marks)
- c. Explain the differences between INT and CALL instruction. (04 Marks)

## Module-3

- 5 a. Explain these instructions in brief:  
i) CBW      ii) CWD      iii) IMUL      iv) IDIV (08 Marks)
- b. Explain these string instructions :  
i) MOVSB      ii) CMPSW      iii) SCAS      iv) LODSB (08 Marks)
- c. With neat diagram, explain NAND gate address decoder. (04 Marks)

OR

- 6 a. Explain these instructions:  
i) LEA      ii) XCHG      iii) SAHF      iv) XLAT      v) OUT (10 Marks)
- b. Explain the differences between memory-mapped IO and IO mapped IO. (04 Marks)
- c. Explain control word format of 8255. (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-4**

- 7 a. Differentiate between CISC and RISC. Also explain 4 major rules of RISC design. (06 Marks)  
 b. Explain ARM core data flow model with neat diagram. (08 Marks)  
 c. List and explain Registers of ARM processor. (06 Marks)

OR

- 8 a. Differentiate Microprocessor and Microcontroller. (06 Marks)  
 b. Explain pipeline mechanism of ARM. (06 Marks)  
 c. Explain ARM based embedded device, a microcontroller with neat diagram. (08 Marks)

**Module-5**

- 9 a. Mention and explain the salient features of ARM instruction set. (06 Marks)  
 b. Explain instructions :  
 i) MVN      ii) LSR      iii) ROR      iv) SUBS      v) ORR (10 Marks)  
 c. Explain Barrel shifter with example. (04 Marks)

OR

- 10 a. Explain Instructions :  
 i) SMULL      ii) BLX      iii) LDR      iv) LDM (08 Marks)  
 b. Explain SWI Instructions. (04 Marks)  
 c. Explain instructions :  
 i) MRS      ii) ADR      iii) MRC      iv) SWP (08 Marks)

\*\*\*\*\*

CMRIT LIBRARY  
 BANGALORE - 560 037