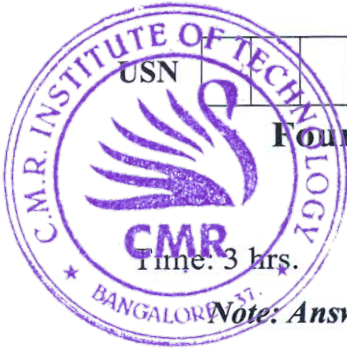


CBCS SCHEME



15CS44

Fourth Semester B.E. Degree Examination, Jan./Feb. 2023

Microprocessors and Microcontrollers

Max. Marks: 80

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

Module-1

- 1 a. What is pipelining and how does it make the CPU execute faster? Clearly explain Pipelined versus Non-pipelined execution with suitable diagram. (04 Marks)
- b. With the help of 8086 microprocessor internal architecture block diagram, explain in detail BIU (Bus Interface Unit). (06 Marks)
- c. For the following Assembly Language instructions, tabulate the answers for size, operation and to which addressing mode it belongs to
(i) MOV DI, ABC[BX]
(ii) MOV [DI], BH
(iii) MOV CH, DS : [1000H]
(iv) MOV CS, AX
(v) PUSH WORD PTR[BX]
(vi) MOV AX, 44 (06 Marks)

OR

- 2 a. What is a flag and flag register? Explain the format of flag register, with suitable example. Show how various flag register bits are affected by the following code:
MOV AX, 94C2H
MOV BX, 323EH
ADD AX, BX
MOV DX, AX
MOV CX, DX
Clearly list the results obtained after execution. (08 Marks)
- b. What are Assembler Directives? Why they are also called as pseudo instructions? Explain the following with example:
(i) PROC and ENDP
(ii) SEGMENT and ENDS
(iii) MACRO and ENDM (08 Marks)

Module-2

- 3 a. For the following instructions, write its respective syntax, description, flags affected and examples:
(i) JCXZ (ii) NOP (iii) NEG (iv) IN (v) LEA (10 Marks)
- b. Write a program that finds the number of 1's in a byte with necessary comments in the program. (06 Marks)

OR

- 4 a. List and explain first five software interrupts. (10 Marks)
- b. Write a program to count the number of 1's in a word. Provide the count in BCD. Write necessary comments in the program. (06 Marks)

Module-3

- 5 a. Explain in detail the Data Integrity in RAM and ROM. (08 Marks)
b. Write a program to read a string convert to uppercase and store in array and display on monitor. (08 Marks)

OR

- 6 a. Interface an 8255 with 8086 microprocessor to work as I/O port. Initialize PORT A as output port, PORT B as input port and PORT C as output port. The address of PORT A is 0740H. Write a program to sense switch positions SW0 to SW7 connected at PORT B. The sensed pattern is to be displayed on PORT A to which 8 LED's are connected, while PORT C lower displays number of ON switches out of the total 8 switches. (08 Marks)
b. Explain the various string instructions. (08 Marks)

Module-4

- 7 a. Explain in detail the various registers of ARM processor present in programmers model. (08 Marks)
b. Write a note on Exception/Interrupt and the vector table. (08 Marks)

OR

- 8 a. Explain the various units present in ARM core data flow model block diagram. (08 Marks)
b. With relevant block diagram, explain the various stages of pipeline present in ARM organization. (08 Marks)

Module-5

- 9 a. List down and explain the salient features of ARM instruction set. (08 Marks)
b. Write a program to display string stored in source to monitor via destination address, with necessary comments to the program. (08 Marks)

OR

- 10 a. Explain with syntax and examples, the different types of Data Processing instructions present in ARM. (08 Marks)
b. Write a program to print r1 in hexadecimal with necessary comments to the program. (08 Marks)

* * * * *