Total number of printed pages: **05** **D/4th/DCSE403**

2021

MICROPROCESSOR

Full Marks: 60

Time: Two hours

The figures in the margin indicate full marks for the questions.

A. Multiple Choice Questions 1 x 20=20

1. 8085 microprocessor can understand a maximum of _____ words.
   a. 128
   b. 256
   c. 512
   d. No limit.
2. While executing an instruction, if the content of Address Bus is currently D009h, then, the content of Program counter in 8085 is-
   a. D008h
   b. D009h
   c. D00Ah
   d. D010h
3. During the execution of the instruction JP NEXT, the microprocessor will jump to the label NEXT if-
   a. Parity flag is set.
   b. Parity flag is reset.
   c. Sign flag is set.
   d. Sign flag is reset.
4. After an arithmetic or logical operation, Zero flag is set if-
   a. Bit D7 of the result is zero.
   b. Bit D7 of the result is one.
   c. Result of the operation is zero.
   d. Result of the operation is non-zero.

5. Which one of the following is an example of Register Addressing Mode?
    a. MOV A, B
    b. MVI C, 2000h
    c. STA 2050h
    d. All of the above
6. Which one of the following instructions will never modify the content of accumulator?
    a. IN 03h
    b. ADD B
    c. XRA A
    d. ORA A
7. Which one of the following instructions will not affect the carry flag?
    a. ADI 05h
    b. SUB B
    c. INR A
    d. CMP B
8. It is required to mask all the four high-order bits of an 8-bit data. The required instruction is-
    a. ANI 80h
    b. ANI 08h
    c. ANI F0h
    d. ANI 0Fh
9. The result of an arithmetic operation is FFh with a carry. Which of the following instructions will transfer the program to the Label NEXT?
    a. JM NEXT
    b. JC NEXT
    c. JPE NEXT
    d. All of the above
10. The size of a memory chip is 2024 X 4 bits. How many such chips will be required to build a memory system of 8 K Bytes?
    a. 4
    b. 6
    c. 8

d. 10

11. If the content of Accumulator is 00h, then, after the execution of instruction SUI 03h, its content will be-

    a. 03h

    b. -03h

    c. FEh

    d. FDh

12. Content of Accumulator is 05h. After the execution of CPI 06h-

    a. Zero flag will be set and carry flag will be reset

    b. Both Zero flag and carry flag will be set

    c. Zero flag will be reset and carry flag will be set

    d. Both Zero and carry flag will be reset

13. The content of address bus at the 8^{th} T-state during the execution of the instruction IN 02h if the instruction is assembled starting at C000h is-

    a. C0h

    b. 01h

    c. 02h

    d. Cannot be specified

14. The content of data bus at the 9^{th} T-state during the execution of the instruction OUT FFh if the instruction is assembled starting at C000h is-

    a. 00h

    b. 01h

    c. FFh

    d. Content of Accumulator

15. Size of the instructions STA 2000h and STAX D in Bytes are-

    a. 1 and 3 respectively

    b. 3 and 3 respectively

    c. 3 and 1 respectively

    d. 1 and 1 respectively

16. OUT 03h is an example of-

    a. Direct addressing mode

    b. Register addressing mode

c. Immediate addressing mode

d. Implicit addressing mode

17. If the Content of H is 30h and L is 20h, then, after the execution of the instruction MVI M, 25h,

a. 25h will be loaded in Accumulator

b. 25h will be loaded in memory location 3020h

c. 25h will be loaded in memory location 2030h

d. None of the above

18. If the content of A is XXH and B is YYH such that XX<YY, then after the execution of instruction SUB B,

a. Zero flag will be set and carry flag reset

b. Both Zero and carry flags will be reset

c. Zero flag will be reset and carry flag will be set

d. Both Zero and carry flags will be set

19. Which of the following instructions will clear the content of the accumulator?

a. SUB A

b. XRA A

c. ANI 00h

d. All of the above

20 The machine cycles in the instruction STAX D are-

a. Opcode Fetch, Memory Read, Memory Write

b. Opcode Fetch, Memory Write

c. Opcode Fetch, Memory Read

d. Opcode Fetch

B. Very Short Question 2*6=12

1. State the meaning of the instruction MOV A, M.

2. State the functions of ALE and $IO/\bar{M}$ pins.

3. The address of the final memory location of a memory chip of size 1024X8 is FFFFh. What is the address of the initial memory location?

4. Identify the number of machine cycles and T-states for the instructions- STA C050h and OUT 05h.

5. What will be the contents of address bus and data bus at the 9^{th} T-state while executing the instruction MVI M, 08h?

6. What do you mean by the term Machine Cycle?

C Short Question (Any seven) 4*7=28

1. Write an Assembly language program for 8085 to transfer the contents of five memory locations D000-D004h to E000-E004h.
2. Specify the final content of the accumulator and status of the flags for the program given below-

```
MVI A, FFh
MVI B, 08h
ADD B
ADI 02h
ORA B
ANI F0h
 HLT
```

3. Write a program to display the contents of memory locations E000-E009h via port 02h.
4. Write a program to generate a delay of 1.5 ms within a main program for 8085. Assume the system clock frequency to be 2MHz.
5. Explain how the multiplexed Address/Data bus AD_7-AD_0 is de-multiplexed.
6. Draw the bus timing diagram for the instruction MOV M, A.
7. Draw an interfacing circuit for a memory chip of size 4096X8 such that, the starting memory is C000h.
8. Draw an interfacing circuit for an output latch so that its address is 05h.
9. Briefly explain how the flags are affected during the execution of an instruction.