Total number of printed pages:6 **D/4th/DIE403**

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. Which of the following is a typical example of embedded system?
   a. CD-ROM
   b. Hard disk
   c. Copying machine
   d. All of these
2. A processor with 32-bit word is known as
   a. 8-bit microprocessor
   b. 16-bit microprocessor
   c. 32-bit microprocessor
   d. 64-bit microprocessor
3. Central processing unit (CPU) consist of
   a. Arithmetic/logic unit
   b. Control Unit
   c. Both (a) & (b)
   d. None of the above
4. Microcontroller chip included additional devices such as
   a. A/D converter
   b. Serial I/O
   c. Timers
   d. All of the above

5. When more than 100 gates are fabricated on a single chip, the fabrication technology is called
    a. SSI
    b. MSI
    c. LSI
    d. VLSI
6. The read/write (R/WM) is
    a. Random access memory
    b. User memory
    c. Both (a) & (b)
    d. None of the above
7. The examples of output devices that transfer data from the microprocessor to the outside world are
    a. Light emitting diodes (LEDs)
    b. Cathode ray tube (CRT)
    c. Printer
    d. All of the above
8. Examples of high level languages are
    a. BASIC
    b. FORTRAN
    c. C++
    d. All of the above
9. The 8085 microprocessor has _____ no's of different instructions in its instruction set.
    a. 74
    b. 246
    c. 256
    d. 512
10. The no's of general purpose registers available in 8085 to store 8-bit data are
    a. 6
    b. 8

c. 10

d. 12

11. The instruction SUB A will make the contents of accumulator

a. Double

b. Zero

c. Half

d. None of these

12. The instructions available in 8085 to control machine control operations are

a. Halt

b. Interrupt

c. Do nothing

d. All of these

13. The size of the instruction CMA is

a. 1-byte

b. 2-byte

c. 3-byte

d. 4-byte

14. The largest number that can be processed by 8085 at one time is

a. 0F H

b. F0 H

c. FF H

d. EF H

15. With 16-bit address lines the entire memory address can range from

a. 0 – F H

b. 00 – FF H

c. 000 – FFF H

d. 0000 – FFFF H

16. Calculate the number of memory chips needed to design a 4kB memory if the chip size is 1024 X 1

a. 8

b. 16

c. 32

d. 64

17. Tri-state devices have the states

a. Logic-0

b. Logic-1

c. High impedance

d. All of the above

18. In case of a buffer, the logic level of the output is _____as that of the input.

a. Same

b. Opposite

c. At Logic-0

d. At Logic -1

19. Which of the following is a non-maskable interrupt

a. INTR

b. RST 7.5

c. RST 6.5

d. TRAP

20 To operate the 8085 microprocessor at 3 MHz, what should be the input frequency at X1 & X2 pins?

a. 1 MHz

b. 3 MHz

c. 6 MHz

d. 9 MHz

B. Very Short Question 2 X 6 = 12

1. Specify the size of the following instructions:

a) MVI A, FF H

b) ORA C

c) STA EDFF H

d) JMP D000 H

2. State the function of ALE and IO/$\overline{M}$ signals of 8085 microprocessor.

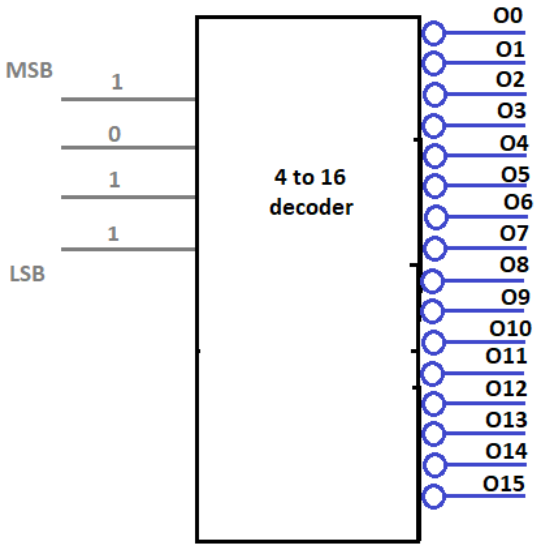
3. Identify the machine cycles in the following instructions:

   a) STA 3050 H

   b) ADI 22 H

4. If 8085 adds FF H & 79 H, specify the contents of the accumulator and the status of S, Z and CY flags.

5. The memory address of the last location of a 4kB memory chip is DFFF H. Find the starting address.

6. 

   Specify the output line of the 4 to 16decoder that goes low if the input to the decoder is 1011 as shown in the figure.

C Short Question 4 X 7 = 28

1. Draw ad explain the timing diagram of LDA C0F7 H instruction.

   Assume the instruction is written as:

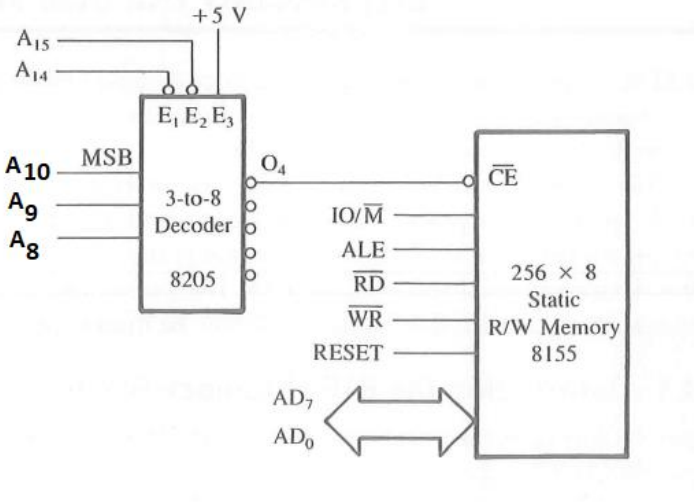
Memory Location	Mnemonics	Hex Code
B000 H	LDA C0F7 H	3A
B001 H		F7
B002 H		C0

2. Write an assembly language program to find the smallest number from the data array as depicted below.

Memory location	Stored numbers
C000 H	03

C001 H	05
C002 H	01
C003 H	07
C004 H	11
C005 H	02
C006 H	13
C007 H	1F
C008 H	20

3.



Identify the memory address range of the above interfacing. Also, mention the foldback /mirror memory ranges.

4. Draw the functional block diagram of 8085 microprocessor.

5. With a schematic show how he four different control signals ($\overline{MEMR}, \overline{MEMW}, \overline{IOR}, \overline{IOW}$) are generated by combining the signals $\overline{RD}$, $\overline{WR}$ and IO/$\overline{M}$.

6. Make a comparison between Memory-mapped-I/O and I/O-mapped I/O technique.

7. Calculate the decimal value of the number in the accumulator before and after the Rotate instruction in the following program is executed, and explain the mathematical function performed by the instruction.

MVI A, 18 H

RLC

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