Printed Page:- 04 **Subject Code**:- **AMICSE0405**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech (Integrated)

SEM: IV - THEORY EXAMINATION (2023 - 2024)

Subject: Microprocessor

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* **three Sections -A, B, & C.** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION A **20**

1. Attempt all parts:-

1-a. Which of the following is true about microprocessors? (CO1) 1

(a) It has an internal memory

(b) It has interfacing circuits

(c) It contains ALU, CU, and registers

(d) It uses Harvard architecture

1-b. What is stored in the H & L general-purpose register? (CO1) 1

(a) Opcode

(b) Address of memory

(c) Address of next instruction

(d) Temporary data

1-c. In 8085, HLT opcode means: (CO2) 1

(a) Remain idle for 10 seconds

(b) Remain idle for 0.1 seconds

(c) End of Program

(d) none of above

1-d. In 8085 microprocessor, how many interrupts are maskable. (CO2) 1

(a) 2

(b) 3

(c) 4

(d) 5

1-e. The Stack follows the sequence. (CO3) 1

(a) first-in-first-out

(b) first-in-last-out

(c) last-in-first-out

(d) last-in-last-out

1-f. How many T-states does MVI M, 38H instruction takes? (CO3) 1

(a) 4

(b) 7

(c) 10

(d) 6

1-g. The 8085 microprocessor has two instructions for data transfer between the processor and the I/O devices. (CO4) 1

(a) Rx & Tx

(b) DIN & DOUT

(c) IN & OUT

(d) MVI & STA

1-h. Calculate the address lines required for an 8K Byte memory chip. (CO4) 1

(a) 13

(b) 12

(c) 11

(d) 10

1-i. All the functions of the ports of 8255 are achieved by programming the bits of an internal register called(CO5) 1

(a) data bus control

(b) read logic control

(c) control word register

(d) none of the mentioned

1-j. The supporting modes of operation of 8086 Microprocessor is/are. (CO5) 1

(a) 2

(b) 3

(c) 4

(d) 1

2. Attempt all parts:-

2.a. Explain the basic units of a microprocessor? (CO1) 2

2.b. Find the content of A-Register at the end of this program? (CO2) 2

```
XRA A
MVI B, F0H
SUB B
```

2.c. Explain the function of HOLD and HLDA signal. (CO3) 2

2.d. If the memory chip size is 1024*8 bits, how many chips are required to make up 64KByte memory? (CO4) 2

2.e. List the difference between 8085 & 8086 Microprocessors. (CO5) 2

SECTION B **30**

3. Answer any <u>five</u> of the following:-

3-a. Draw & explain about the different types of Flags in 8085? (CO1) 6

3-b. With neat PIN diagram explain the various signals of 8085 microprocessor. (CO1) 6

3-c. Find the content of A at the end of this program? Also calculate total Number of T-States. (CO2) 6

```
MVI A, 06H
RLC
MOV B, A
RLC
RLC
ADD B
```

3-d. Elaborate all Arithmetic Instructions in 8085, Also tabulate the flag status of all instructions.. (CO2) 6

3.e. Calculate the maximum delay by adjusting the value of count, if microprocessor is working at 2MHz. (CO3) 6

```
      MVI C, count
LOOP: DCR C
      JNZ LOOP
```

3.f. Explain the block diagram of Direct Memory Access (DMA) Controller. (CO4) 6

3.g. Draw and explain register organization of 8086. (CO5) 6

SECTION C **50**

4. Answer any <u>one</u> of the following:-

4-a. Draw the block diagram of 8085 microprocessor architecture and explain each block in detail. (CO1) 10

4-b. Draw and explain timing diagram of each machine cycle executed in STC & INR M. (CO1) 10

5. Answer any <u>one</u> of the following:-

5-a. List difference types of interrupts. Give classification of interrupts. Explain the Hardware and software interrupts. Also Classify Vectored, Non-Vectored; Maskable, Non-maskable. (CO2) 10

5-b. Explain the following instruction in detail. (CO2) 10
DAD, DAA, SBI, SPHL, XTHL, LHLD, PUSH-POP, CALL-RET, STC, CMA.

6. Answer any <u>one</u> of the following:-

6-a. Calculate the total machine cycle taken by the given ALP code and find total T-states for the following instructions. Further evaluate total time taken by the the given code if microprocessor working at 2MHz. (CO3) 10

```
    MOV D, A
    XRA A
    MVI E, 0AH
SUM: ADD D
    DCR E
    JNZ  SUM
```

6-b. Write a program to count continuously in hexadecimal from FFH to 00H in a system with a clock period 0.5 microseconds. Use register C to set up a delay of 0.5ms between each count and display output at one of the output ports .(CO3) 10

7. Answer any <u>one</u> of the following:-

7-a. With Proper diagram explain Memory-Mapped I/O and Peripheral I/O and compare between them. (CO4) 10

7-b. Draw and explain block diagram of 8259 Programmable Interrupt Controller. (CO4) 10

8. Answer any <u>one</u> of the following:-

8-a. Draw and explain the Block diagram of 8255(PPI). (CO5) 10

8-b. Draw and explain the internal architecture of 8086 microprocessor. (CO5) 10