Printed Page:- 04 **Subject Code:-** AMICSE0305

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech (Integrated)

SEM: III - CARRY OVER THEORY EXAMINATION - AUGUST 2023

Subject: Computer Organization & Architecture

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. The smallest unit of data in computer is _____. (CO1) 1

(a) Byte

(b) Nibble

(c) Bit

(d) KB

1-b. We use _____ to resolve the clash over the access of the system BUS. (CO1) 1

(a) BUS arbitrator

(b) Clash resolver

(c) Bus

(d) Priority resolver

1-c. When we perform subtraction on -7 and -5 the answer in 2's complement form is: (CO2) 1

(a) 11110

(b) 1110

(c) 1010

(d) 1000

1-d. One way to make a four-bit adder to perform subtraction is by _____. (CO2) 1

(a) Inverting the output

(b) Inverting the carry-in

(c) Inverting the B inputs

(d) Grounding the B inputs

1-e. Each stage in pipelining should be completed within _____ cycle. (CO3) 1

(a) 1

(b) 2

(c) 3

(d) 4

1-f. While executing the PUSH A instruction, the stack pointer is decremented by_____. (CO3) 1

(a) 1 bit

(b) 2 bit

(c) 4 bit

(d) 8 bit

1-g. Maximum time required before a dynamic RAM must be refreshed is: (CO4) 1

(a) 2 ms

(b) 4 ms

(c) 6 ms

(d) 8 ms

1-h. _____ is also called auxiliary storage. (CO4) 1

(a) tertiary memory

(b) secondary memory

(c) primary memory

(d) cache memory

1-i. A _____ command is issued to activate the peripheral and to inform it what to do. (CO5) 1

(a) Control

(b) Status

(c) Data output

(d) Data Input

1-j. Instructions that are read from memory by an IOP are sometimes called _____, to distinguish them from instructions that are read by the CPU. (CO5) 1

(a) Commands

(b) Instructions

(c) Program

(d) Subroutine

2. Attempt all parts:-

2.a. Write the sequence of microoperation for implementation of PUSH operation in register stack. (CO1) 2

2.b. Define the value of E in hardware diagram of multiplication algorithm. (CO2) 2

2.c. What is control unit? (CO3) 2

2.d. What is volatile memory? (CO4) 2

2.e. Explain difference between software and hardware interrupts. (CO5) 2

SECTION B **30**

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

3-a. An instruction is stored at location 400 with its address field at location 401.The address field has the value 500.A processor register R1 contains the number 200. Evaluate the effective address if the addressing mode of the instruction is (i) direct (ii) immediate (iii) relative (iv) register indirect (v) index with R1 as index register. (CO1) 6

3-b. What is Memory? Differentiate between RAM and ROM. (CO1) 6

3-c. What is CLA? Explain with the help of logic diagram. (CO2) 6

3-d. Solve the -12.534 with double precision representation. (CO2) 6

3.e. Explain the concept of microprogrammed with the help of suitable example. (CO3) 6

3.f. Define memory hierarchy with the help of diagram and explain its characteristics. (CO4) 6

3.g. Why does the DMA have higher priority over CPU when both request memory transfer? (CO5) 6

SECTION C **50**

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

4-a.	What do you understand by three state buffers? Explain the memory transfer with the help of memory read and memory write operation. (CO1)	10
4-b.	Explain various types of processor Organization. (CO1)	10

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

5-a.	Explain the 1-bit ALU with suitable diagram. (CO2)	10
5-b.	Explain the Signed magnitude multiplication algorithm with the help of flow diagram. (CO2)	10

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

6-a.	Differentiate between micro-programmed and hardwired control unit. (CO3)	10
6-b.	What is Auxiliary memory? Explain with examples. (CO3)	10

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

7-a.	What is a register? How many types of registers are there used in digital computers? (CO4)	10
7-b.	Explain the set associative cache mapping using block diagram and example. (CO4)	10

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

8-a.	Explain CPU - IOP Communication. Draw the flowchart showing the sequence of operations to be carried out. (CO5)	10
8-b.	Explain the operation of Asynchronous communication interface with help of block diagram. (CO5)	10