Printed Page:- 03 Subject Code:- ACSAI0302

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: III - THEORY EXAMINATION (2024- 2025)

Subject: Logic Design and Computer 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. Which of the following gates are considered as universal gates? (CO1, K1) 1

(a) AND,OR

(b) NAND,NOT

(c) NAND,NOR

(d) NOR,AND

1-b. Half Subtractor is used to perform subtraction of _____. (CO1, K1) 1

(a) 2 bits

(b) 3 bits

(c) 4 bits

(d) None

1-c. When 10001 is used to divide 0111000000 the remainder is _____. (CO2, K3) 1

(a) 0110

(b) 1110

(c) 1000

(d) 1001

1-d. How many half adders are required for implementing full adder? (CO2, K1) 1

(a) 2

(b) 3

.

(c) 4

(d) 5

1-e. A _____ unit works by receiving input information to which it converts into control signals, which are then sent to the central processor. (CO3, K1) 1

(a) ALU

(b) Control

(c) Memory

(d) Input/Output

1-f. Which of the following is used to implement an instruction pipeline? (CO3, K1) 1

(a) FIFO

(b) FILO

(c) LIFO

(d) None of these

1-g. What is the full form of RAM? (CO4, K1) 1

(a) Random access memory

(b) Read access memory

(c) Readable access memory

(d) None of the above

1-h. Which is volatile memory? (CO4, K1) 1

(a) RAM

(b) PROM

(c) EPROM

(d) None of the above

1-i. Computer consist of _____ and _____. (CO5, K1) 1

(a) RAM

(b) ROM

(c) a & b

(d) None of the mentioned

1-j. The communication line between CPU,memory and Peripheral is called ____. (CO5, K1) 1

(a) Bus

(b) Connection

(c) Switch

(d) None of the mentioned

2. Attempt all parts:-

2.a. What is three-state buffer? Draw the symbol. (CO1, K1) 2

2.b. Define Half adder. (CO2, K1) 2

2.c. Define program and instruction in short. (CO3, K1) 2

.

2.d.	What is memory space? (CO4, K1)	2
2.e.	Write short note on- a) Input-Output Processor b) Serial Communication. (CO5, K2)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Draw the diagram of bus system that uses three state buffers and 2:4 decoder instead of multiplexers and Explain how it works. (CO1, K3)	6
3-b.	Explain the different type of Bus structures for interconnecting functional units along with diagram. (CO1, K2)	6
3-c.	Sketch the flow diagram of division algorithm with suitable example. (CO2, K2)	6
3-d.	Solve the -25.134 with single and double precision representation. (CO2, K3)	6
3.e.	Explain RISC . Differentiate between RISC and CISC. (CO3, K1)	6
3.f.	Define set associative cache memory. (CO4, K1)	6
3.g.	What are peripheral devices? Explain with examples. (CO5, K1)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	With the help of proper block diagram explain the bus transfer using multiplexer. (CO1, K2)	10
4-b.	What is Stack organization? Explain Memory Stack organization. (CO1, K1))	10

5. Answer any one of the following:-

5-a.	Calculate 5 X 6 with the help of signed magnitude algorithm. (CO2, K3)	10
5-b.	Explain flow diagram of Booth's multiplication algorithm. (CO2, K1)	10

6. Answer any one of the following:-

6-a.	What is pipelining? Explain the difference between arithmetic and instruction pipeline. (CO3, K1)	10
6-b.	Differentiate between micro programmed and hardwired control unit. (CO3, K3)	10

7. Answer any one of the following:-

7-a.	Explain working of a semiconductor RAM with help of block diagram and function table. (CO4, K1)	10
7-b.	What is the need of auxiliary memory? Explain difference between magnetic disk and optical disk. (CO4, K1)	10

8. Answer any one of the following:-

8-a.	Explain various modes of data transfer between processor and peripheral devices. (CO5, K2)	10
8-b.	Explain DMA and its working with proper diagram (CO5, K2)	10

.