Printed Page:-03 Subject Code:- BCSE0305 / BCSEH0305

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: Computer Organization and 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,K1) 1

(a) Byte

(b) Nibble

(c) Bit

(d) KB

1-b. The addressing mode in which the operands are in registors that reside within the CPU.(CO1,K2) 1

(a) Register addressing mode

(b) Index addressing mode

(c) Relative addressing mode

(d) Implied addressing mode

1-c. When we perform subtraction on -7 and -5 the answer in 2's complement form is: (CO2,K2) 1

(a) 11110

(b) 1110

(c) 1010

(d) 1000

1-d. The ALU gives the output of the operations and the output is stored in the.(CO2,K1) 1

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(a) Memory Devices
(b) Registers
(c) Flags
(d) Output Unit

1-e. Two important fields of an instruction are (CO3,K1) 1

(a) Opcode
(b) Operand
(c) mode
(d) Both 1 & 2

1-f. The type of control signal is generated based on _____(CO3,K2) 1

(a) contents of the step counter
(b) Contents of IR
(c) Contents of condition flags
(d) All of the mentioned

1-g. When power is switched off which memory loses its data.(CO4,K1) 1

(a) Non-Volatile Memory
(b) Volatile Memory
(c) Both A and B
(d) None of the above

1-h. The secondary memory of a computer can act as a_____.(CO4,K2) 1

(a) Cache
(b) virtual memory
(c) RAM
(d) ROM

1-i. UART stands for _____(CO5,K1) 1

(a) Universal Asynchronous Receiver Transmitter
(b) Universal Asynchronous Relay Transmission
(c) Universal Accumulator Register Transfer
(d) None

1-j. An interrupt that can be not ignored is_____. (CO5,K2) 1

(a) TRAP
(b) Software
(c) Both
(d) None of above

2. Attempt all parts:-

2.a. Explain different type of buses. (CO1,K2) 2

2.b. Explain the Advantages and Disadvantages of CLA.(CO2,K2) 2

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2.c.	Differenciate between instruction & Program.(CO3,K2)	2
2.d.	Define role of key register in associative memory.(CO4,K2)	2
2.e.	Explain the difference between paging and segmentation .(CO4,K3)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Explain Single accumulator organization, General register organization and Stack organization.(CO1,K1)	6
3-b.	Explain various types of bus arbitration and explain with block diagram. (CO1,K2)	6
3-c.	Represent double precision of IEEE 754 for -2.35 .(CO2,K3)	6
3-d.	Describe CLA. Explain with the help of logic diagram. (CO2,K3)	6
3.e.	Evaluate the arithmetic expression X = (A + B) * (C + D) using two address and three address instructions. (CO3,K2)	6
3.f.	Describe FIFO and LIFO page replacement algorithms.(CO4,K2)	6
3.g.	Explain Daisy Chaining method of establishing priority with diagram. (CO5,K2)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Define common fields found in instruction format. Explain any two addressing modes with example. (CO1,K3)	10
4-b.	Explain Rotating arbitration scheme with diagram, its advantage and disadvantage.(CO1,K2)	10

5. Answer any one of the following:-

5-a.	Describe the array multiplier 2 bit binary numbers b1 b0 X a1 a0 with AND gate and half adder.(CO2,K2)	10
5-b.	Explain Booth multiplication algorithm flow diagram with example.(CO2,K3)	10

6. Answer any one of the following:-

6-a.	Discuss the different types of microoperations with examples.(CO3,K2)	10
6-b.	Demonstrate the three address and one address instruction with suitable examples.(CO3,K2)	10

7. Answer any one of the following:-

7-a.	Discuss the 2D and 2.5 D organization with suitable diagram.(CO4,k3)	10
7-b.	Discuss the different mapping techniques used in cache memories and their relative merits and demerits.(CO4,K2)	10

8. Answer any one of the following:-

8-a.	Describe Input-Output Processor (IOP)? Draw block diagram of a computer with I/O Processor.(CO5,K3)	10
8-b.	Explain DMA transfer in a computer system with help of a diagram.(CO5,K2)	10