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Printed Page:-4 **Subject Code:- CMCA0101**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)
MCA
SEM: I - THEORY EXAMINATION (2025 - 2026)
Subject: Computer System & Organization

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 basic unit of digital computers is called:(CO1 , K1) 1

(a) Bit
(b) Byte
(c) Word
(d) Nibble

1-b. A NOT gate is an example of:(CO1 , K2) 1

(a) Unary operation
(b) Binary operation
(c) Ternary operation
(d) Quaternary operation

1-c. A Half Adder can add (CO2, K1) 1

(a) Two 1-bit numbers
(b) Three 1-bit numbers
(c) Two 2-bit numbers
(d) Only carry

1-d. Multiplexer is also called (CO2, K1) 1

(a) Data Distributor
(b) Data Selector
(c) Encoder
(d) Decoder

1-e. Data transfer in a register requires an enable/load signal.(CO3,K1) 1

(a) Write enable
(b) Clock pulse
(c) Enable signal
(d) All of the above

1-f. A shift register is used for shifting data left or right.(CO3,K1) 1

(a) To store data temporarily
(b) To shift data bits left or right
(c) To add two numbers
(d) To multiply data

1-g. In which mode of DMA one word is transferred at a time.(CO4,K2) 1

(a) Cycle stealing
(b) Burst transfer
(c) Bus Grant
(d) Bus Request

1-h. The hardware interrupts that can neither be ignored nor delayed (CO4,K1) 1

(a) Non-maskable h/w interrupt
(b) Hardware interrupt
(c) Software interrupt
(d) Maskable h/w interrupt

1-i. The Program Counter (PC) tracks the? (CO5, K1) 1

(a) Next instruction to be executed
(b) Current instruction being executed
(c) Memory address of data
(d) Status flags

1-j. A 16-bit memory address in the 8085 microprocessor allows addressing how much memory? (CO5, K1) 1

(a) 1K bytes
(b) 64K bytes
(c) 128K bytes
(d) 256K bytes

2. Attempt all parts:-

2.a. Define a digital computer.(CO1 , K2) 2

2.b. Define Half Subtractor (CO2, K2) 2

2.c. List Four characteristics of a register.(CO3,K2) 2

2.d. Explain interrupts? How are they handled? (CO4,K2) 2

2.e. Define the function of an ALU in a microprocessor. (CO5, K2) 2

SECTION-B 30

3. Attempt all parts:-

3.a. Answer any one of the following:-

3.a.(i) Discuss the different number systems used in computing and their 6

conversions.(CO1 , K3)

3.a.(ii)	Explain fixed-point representation, including its advantages and limitations in numerical computing.(CO1 , K4)	6

3.b. Answer any one of the following:-

3.b.(i)	Describe the working principle of Demultiplexer with application (CO2, K4)	6
3.b.(ii)	Construct a J-K Flip Flop using S-R Flip Flop (CO2, K3)	6

3.c. Answer any one of the following:-

3.c.(i)	Compare the advantages and disadvantages of a common bus system in computer architecture.(CO3,K3)	6
3.c.(ii)	Describe the process of a memory read and memory write operation using RTL statements.(CO3,K4)	6

3.d. Answer any one of the following:-

3.d.(i)	Describe the role of bus request line in DMA (CO4,K3)	6
3.d.(ii)	Name the types of interrupts and Define the Modes of data Transfer (CO4,K4)	6

3.e. Answer any one of the following:-

3.e.(i)	Differentiate between fetch, decode, and execute stages of the instruction cycle. (CO5, K3)	6
3.e.(ii)	Differentiate between assembly language and machine language and explain how assembly language is translated into machine code. (CO5, K3)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Describe the various number systems utilized in digital computing and provide examples of conversions between them.(CO1 , K4)	10
4-b.	Explain fixed-point representation and discuss its advantages and limitations in numerical computations.(CO1 , K4)	10

5. Answer any one of the following:-

5-a.	Construct a Full Subtractor circuit and explain its operation with truth table and Boolean equations. (CO2, K5)	10
5-b.	Discuss the applications of Multiplexers and Demultiplexers in modern digital systems. (CO2, K4)	10

6. Answer any one of the following:-

6-a.	Explain the role of control lines, data lines, and address lines in a common bus system.(CO3,K4)	10
6-b.	Explain any four.(CO3,K3) (i) Program Counter Register (ii) Address Register (iii) Instruction Register (iv)Data Register (v) Output and Input Register. (vi) RISC & CISC Architecture	10

7. Answer any one of the following:-

7-a.	Explain memory system and their types.(CO4,K3)	10

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7-b.	Design a diagram for Data transfer from I/O device to CPU in connection with programmed I/O and explain. (CO4,K4)	10

8. Answer any one of the following:-

8-a.	Explain the pin diagram of 8085 microprocessor. (CO5, K3)	10
8-b.	Define the concept of indexed addressing mode. Explain how it works with an example. (CO5, K4)	10