Printed Page:-04 Subject Code:- BMCA0106 Roll. No: NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA (An Autonomous Institute Affiliated to AKTU, Lucknow) MCA **SEM: I - THEORY EXAMINATION (2024-2025)** 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. In Boolean algebra, the identity law states that A + 1 equals: (CO1,K1) 1 A + 1(a) A-1 (b) (c) 0 (d) Α 1-b. A Karnaugh Map can simplify expressions with up to how many 1 variables?(CO1,K1) 1 (a) 2 (b) 5 (c) (d) 4 1-c. What is the main use of a Binary to Gray Code converter?(CO2,K1) 1 (a) Simplify arithmetic operations Minimize switching errors (b) (c) Compress data (d) Convert text to binary 1-d. How many inputs and outputs does a Full Adder have?(CO2,K1) 1

- (a) 2 inputs, 1 output
- (b) 3 inputs, 2 outputs

	(c)	4 inputs, 2 outputs		
	(d)	3 inputs, 1 output		
1-e.	Which register holds the memory address of the data to be accessed?(CO3,K1)			
	(a)	Instruction Register (IR)		
	(b)	Program Counter (PC)		
	(c)	Memory Address Register (MAR)		
	(d)	Accumulator (AC)		
1-f.	What type of circuit is used to implement registers?(CO3,K1)			
	(a)	Sequential circuits		
	(b)	Combinational circuits		
	(c)	Analog circuits		
	(d)	Arithmetic circuits		
1-g.	Т	he path for communication between two components is known as:(CO4,K1)	1	
	(a)	Interface		
	(b)	Interrupt		
	(c)	Internet		
	(d)	Interleave		
1-h.	The mode of data transfer takes place between the central unit and i/o devices is/are:(CO4,K1)		1	
	(a)	Programmed I/O		
	(b)	Interrupt driven I/O		
	(c)	DMA		
	(d)	All		
1-i.	Т	he 8085 microprocessor operates on which type of data size?(CO5,K1)	1	
	(a)	16-bit		
	(b)	8-bit		
	(c)	32-bit		
	(d)	64-bit		
1 - j.	A typical clock speed range for the 8085 microprocessor is between?(CO5,K1)			
	(a)	1 MHz and 3 MHz		
	(b)	5 MHz and 10 MHz		
	(c)	2 MHz and 8 MHz		
	(d)	10 MHz and 15 MHz		
2. Att	empt	all parts:-		
2.a.	I1	lustrate a Karnaugh map for two variables.(CO1,K4)	2	
2.b.	D ci	escribe the key differences between combinational and sequential arcuits.(CO2,K2)	2	
2.c.	E	xplain why registers are faster than main memory.(CO3,K2)	2	

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2.d.	Explain interrupts? How are they handled?(CO4,K2)	2
2.e.	Define the function of an ALU in a microprocessor.(CO5,K1)	2
SECTIO	<u>N-B</u>	30
3. Answe	r any <u>five</u> of the following:-	
3-a.	Discuss the different number systems used in computing and their conversions.(CO1,K2)	6
3-b.	Explain the overview of basic logic gates and their truth tables, including AND, OR, and NOT gates.(CO1,K2)	6
3-с.	Explain the difference between a latch and a flip-flop in terms of functionality and design.(CO2,K2)	6
3-d.	Discuss how does an SR flip-flop handle invalid input conditions, and how can this issue be resolved?(CO2,K2)	6
3.e.	Explain the working of a common bus system with the help of a block diagram.(CO3,K2)	6
3.f.	What is flash memory ?Explain in detail.(CO4,K2)	6
3.g.	Difference between a one-pass and two-pass assembler. Explain the advantages and disadvantages of each approach in assembly language programming.(CO5,K2)	6
SECTIO	N-C	50
4. Answe	r any <u>one</u> of the following:-	
4-a.	Illustrate the process of simplifying a Boolean expression using a Karnaugh map, specifically for three variables.(CO1,K4)	10
4-b.	Explain the operation of a half-adder circuit, including its design and truth table.(CO1,K2)	10
5. Answe	r any <u>one</u> of the following:-	
5-a.	Describe the working principles of a Gray to binary code converter and explain its implementation using logic gates.(CO2,K2)	10
5-b.	Explain Multiplexer, construct a 4*1 MUX, with its truth table and circuit diagram.(CO2,K2)	10
6. Answe	r any <u>one</u> of the following:-	
6-a.	Differentiate between RISC and CISC architecture and Explain the some advantages and disadvantages of RISC and CISC architecture.(CO3,K4,K2)	10
6-b.	Explain the following: (CO3,K2) (i) Memory Address Register. (ii)Program Counter. (iii)Three Bus (iv) CISC Architecture. (V) Register Transfer Language.	10
7. Answe	r any <u>one</u> of the following:-	
7-a.	Elaborate various data transfer modes.(CO4,K2)	10

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7-b.	Draw a neat diagram for CPU bus signals for DMA transfer and explain.(CO4,K2)	10			
8. Answer any <u>one</u> of the following:-					
8-a.	Define addressing modes. Explain the different types of addressing modes used in microprocessors with examples.(CO5,K2)	10			
8-b.	Explain 8085 architecture in detail and also explain advantage and disadvantage?(CO5,K2)	10			

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