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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)
MCA
SEM: I - THEORY EXAMINATION (2022 - 2023)
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 radix of a Octal number is: (CO1)   1

         (a) 2

         (b) 10

         (c) 8

         (d) 16

1-b.   Convert the following binary code 1011101 to Graycode. (CO1)   1

         (a) 1100110

         (b) 1110011

         (c) 11010

         (d) 1110010

1-c.   SRAM is also known as: (CO2)   1

         (a) MRAM

         (b) DRAM

         (c) MMRAM

(d) Cache

1-d. Computer address bus is   (CO2)   1

     (a) Multidirectional

     (b) Bidirectional

     (c) Unidirectional

     (d) None

1-e. _____ are the different type/s of generating control signals. (CO3)   1

     (a) Micro-programmed

     (b) Hardwired

     (c) Micro-instruction

     (d) Both Micro-programmed and Hardwired

1-f. Stack organization uses (CO3)   1

     (a) PUSH

     (b) POP

     (c) Both

     (d) None

1-g. Cache performance is measured in terms of (CO4)   1

     (a) Throughput

     (b) Thrash

     (c) Hit Ratio

     (d) Miss Ratio

1-h. What is the formula for Hit Ratio? (CO4)   1

     (a) Miss/(Hit + Miss)

     (b) (Hit + Miss)/Miss

     (c) Hit/(Hit + Miss)

     (d) (Hit + Miss)/Hit

1-i. The method that is used to transfer information between internal storage and   1
external I/O devices is known as (CO5)

     (a) I/O interface

     (b) I/O Interrupt

     (c) I/O processor

     (d) None

1-j. What is true about multi core processor? (CO5)   1

(a) Increased responsiveness

(b) Increased worker productivity

(c) Improved performance in parallel environments when running computations on multiple processors

(d) All

2. Attempt all parts:-

2.a.	Describe the number system that is used by the digital computers. (CO1)	2
2.b.	What is Bus Arbitrator? (CO2)	2
2.c.	What is a Control Word? (CO3)	2
2.d.	Write a short note on 2D & 2.5D memory organization. (CO4)	2
2.e.	Explain Hardware interrupt.(CO5)	2

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SECTION B   **30**

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

3-a.	Write a short note on Sequential Logic Circuit. (CO1)	6
3-b.	Draw the truth table and circuit diagram of AND, OR, NOT gates. (CO1)	6
3-c.	Explain the 16-bit common bus organization using diagram and suitable connections among the components of digital computer. (CO2)	6
3-d.	Explain shift microoperation with example. (CO2)	6
3-e.	Explain the following addressing modes: a) Immediate addressing mode b) Implicit addressing mode c) Direct addressing mode (CO3)	6
3-f.	Explain Auxiliary memory with its characteristics.(CO4)	6
3-g.	Explain the following terms with example: a) Input devices b) Output devices (CO5)	6

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SECTION C   **50**

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

4-a.	Explain Multiplexer, construct a 4*1 MUX, with its truth table and circuit diagram. (CO1)	10
4-b.	Convert : a) $(110110.1100)_2 = (?)_{16}$ b) $(501)_{10} = (?)_2$ c) $(735.3)_8=(?)_{10}$ (CO1)	10

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

5-a.	What is Microoperation ? Also discuss about Logical microoperation with proper example. (CO2)	10
5-b.	Design a bus line with three state buffers and explain its functionality. (CO2)	10

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

6-a.   What is register ? Also explain general register organization with the help of   10
block diagram. (CO3)

6-b.   Explain about register stack organization using suitable diagram and write the   10
microoperations for push and pop operations. (CO3)

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

7-a.   What is RAM? List the difference between static RAM and dynamic RAM. (CO4)   10

7-b.   What is memory hierarchy? Also explain the different level of memory   10
hierarchy. (CO4)

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

8-a.   Describe in detail about the Input-Output Interface using suitable diagrams.(10
CO5)

8-b.   What is the importance of DMA? Also explain working of DMA controller with   10
the help of suitable diagram. (CO5)