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Aurora's P.G. College  
Ramanthapur, Hyderabad  
**FACULTY OF INFORMATICS**

Code No. 11369/N

M.C.A. (2-Years Course) I-Semester (CBCS) (Main & Backlog) (New) Examination,

August 2021

Subject : Computer Architecture

Time : 2 Hours

Max. Marks: 70

Missing data, if any, may be suitably assumed

Note: Answer any Four questions :

(4 x 17<sup>1/2</sup> = 70 Marks)

1. a) Explain the procedure for subtraction of unsigned numbers with an example of binary and decimal numbers.  
b) Elaborate on interrupts and its cycle.
2. a) Explain the gray code.  
b) Explain about bus interconnection and its types.
3. a) Construct a bus line with three state buffers.  
b) With an example, explain BSA instruction execution.
4. a) Construct 4-bit combinational circuit shifter and explain its function table.  
b) Demonstrate the illustration of direct – indirect address.
5. a) Explain about the symbolic microprogram.  
b) What are the three types of CPU organizations? Explain each with an example.
6. a) Write and explain the flowchart for the selection of address for control memory  
b) Explain the flowchart for add-subtract operation done in hardware.
7. a) Illustrate memory connection to CPU.  
b) Explain memory table for mapping an initial address.
8. a) Illustrate direct mapping with an example.  
b) Describe segmented – page mapping with a figure.
9. a) Explain Strobe control method of asynchronous data transfer  
b) Illustrate the use of DMA
- 10.a) Elaborate on the steps for instruction pipeline.  
b) Explain the factors of CPU performance.

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**FACULTY OF INFORMATICS**  
**MCA II Semester (CBCS) (Backlog) (New) Examination, December 2021**

**Subject: Computer Organization**

**Time: 2 Hours**

**Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

**Note: Answer any four questions.**

**( $4 \times 17^{1/2} = 70$  M)**

- 1 (a) Distinguish between combinational and sequential circuits.  
(b) What is an flip-flop? Construct 4 bit shift register using flip flop.
- 2 (a) Explain the difference between fixed point and floating point representation with examples.  
(b) Explain how a parity bit can be used as an error detection mechanism.
- 3 (a) What is instruction cycle? Explain its operations through a flow chart.  
(b) Explain bus and memory transfer.
- 4 (a) Explain how the basic computer provides timing and control.  
(b) Write micro operations for fetch cycle.
- 5 (a) Explain how the address sequencing takes place in microprogrammed control unit.  
(b) Explain assembly language.
- 6 (a) Explain assembler with various consequences occurring during two passes of assembler using a flow chart.  
(b) Explain control memory with diagram.
- 7 (a) Explain three segment pipeline timing.  
(b) Explain program control.
- 8 (a) Explain Booth's multiplication algorithms for multiplying binary integers.  
(b) Explain stack organization.
- 9 (a) Explain the DMA operation.  
(b) Explain how the data transfer takes place in programmed I/O method.
- 10 (a) What is an interrupt? Explain parallel priority interrupt mechanism.  
(b) Explain memory hierarchy.

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**FACULTY OF INFORMATICS**  
**MCA II – Semester (CBCS) (Backlog) (New) Examination, August 2021**

Subject: Computer Organization

Max. Marks: 70

Time: 2 Hours

(Missing data, if any, may be suitably assumed)

*(4 x 17<sup>1/2</sup> = 70 Marks)*

Note: Answer any four questions.

- 1 What is a flip-flop? Discuss all types of flip-flop with characteristic tables.
- 2 a) Convert 1101101.1011 into its octal, decimal and hexadecimal equivalents.  
b) Write a note on Binary Counters.
- 3 Discuss the following  
(i) Register Transfer (ii) Arithmetic Micro Operations.
- 4 a) Explain the organization of control unit of Basic computer.  
b) Write micro-operations for fetch cycle of basic computer.
- 5 a) How parameters are passed to subroutines? Demonstrate with an example program?  
b) What are input-output instructions? Write a program to explain I/O instructions?
- 6 a) List the symbols for various micro instruction fields?  
b) Write a short note on Address sequencing.
- 7 a) Explain Flynn's classification of parallel processors.  
b) Write a note on Stack Organization in CPU?
- 8 Explain different types of Addressing modes?
- 9 a) Explain in detail different modes of transfers?  
b) Explain about Memory Hierarchy.
- 10 a) Explain DMA operations?  
b) What is Associative memory? Derive Match logic?

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FACULTY OF INFORMATICS  
M.C.A. II-Semester (CBCS) (Backlog) (Old) Examination, December 2021

Subject: Computer Organization

Time: 2 Hours

Max. Marks: 70

(Missing data, if any, may be suitably assumed)

Note: Answer any four questions.

(4 x 17 1/2 = 70 Marks)

- 1 (a) Describe sequential circuit with an example.  
(b) Give a detailed description of JK flip flop.
- 2 (a) Construct a 4 to 1 line multiplexer.  
(b) Simplify the Boolean function  $F(a.b.c.d)=\Sigma(0,1,2,4,5,7,11,15)$
- 3 (a) Elaborate direct indirect addresses.  
(b) Develop a bus system for four registers.
- 4 (a) Elaborate the process of register transfer.  
(b) Explain hardwired control unit.
- 5 (a) Explain address sequencing in micro programmed control.  
(b) Illustrate flowchart for first pass of assembler.
- 6 (a) Write assembly language program to subtract two numbers.  
(b) Discuss the selection of address for control memory.
- 7 (a) Illustrate instruction formats with examples.  
(b) What is program control? Describe it in detail.
- 8 (a) Describe the general register organization.  
(b) Illustrate instruction pipeline with an example.
- 9 (a) Explain the concept of priority interrupt.  
(b) Explain the technique of direct mapping.
- 10 (a) Write notes on asynchronous data transfer.  
(b) Discuss I/O output interface.

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**FACULTY OF INFORMATICS**

MCA II – Semester (CBCS) (Suppl.) Examination, January 2020

Subject: Computer Organization

Time: 3 Hours

Max.Marks: 70

Note: Answer one question from each unit. All questions carry equal marks.

Unit – I

- |   |   |
|---|---|
| 1 a) Simplify the function using 4-variable K-map $f(a,b,c,d) = \Sigma(2,3,5,7,8,11,13,14,15).$       | 7 |
| b) Describe the different types of flip flops.  | 7 |
| <b>OR</b>   |   |
| 2 a) Design a $16 \times 1$ multiplexer. Using $4 \times 1$ multiplexer and $2 \times 1$ multiplexer. | 7 |
| b) Construct a 2 to -4 line decoder and explain.  | 7 |

Unit – II

- |  |   |
|--|---|
| 3 a) Design a 4-bit adder – subtractor.                                    | 7 |
| b) Describe about shift micro-operations.                                  | 7 |
| <b>OR</b>  |   |
| 4 a) Explain the block diagram of hardwired control unit.                  | 7 |
| b) With a flowchart, explain fetch and decode phases of instruction cycle. | 7 |

Unit – III

- |   |   |
|---|---|
| 5 a) With the help of a flowchart explain first pass of assembler.      | 7 |
| b) Write an assembly language program to perform subtraction operation. | 7 |
| <b>OR</b>   |   |
| 6 a) With an simple example, explain micro programme of control unit.   | 7 |
| b) Explain the flow chart of address sequencing.                        | 7 |

Unit – IV

- |  |   |
|--|---|
| 7 a) Draw and explain general register organization. | 7 |
| b) Enumerate and describe Addressing modes.          | 7 |
| <b>OR</b>  |   |
| 8 a) Explain arithmetic pipeline with a neat figure. | 8 |
| b) Differentiate between CISC and RISC architecture. | 6 |

Unit – V

- |  |   |
|--|---|
| 9 a) With a Flowchart, describe interrupt driven mode of transfer. | 9 |
| b) Write notes on memory hierarchy.                                | 5 |
| <b>OR</b>  |   |
| 10 a) Explain DMA with a neat figure.                              | 8 |
| b) Write notes on cache memory.                                    | 6 |

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Answer Time

1 hour

Total Question

**M.C.A. I-Year II – Semester (Backlog) Examination, January 2020**

**Subject: Computer Organization**

**Time: 3 hours**

**Max. Marks: 80**

**Note: Answer ONE question from each unit. All questions carry equal marks.**

**UNIT – I**

1. (a) Explain in detail about flip-flops. 8
- (b) Simplify the following expressions in (a) a sum-of-products form and (b) product-of-sums form.  
 (i)  $x'z' + y'z' + yz' + xy$   
 (ii)  $AC' + B'D + A'C'D + ABCD$

**OR**

2. (a) Convert hexadecimal number F3A7C2 to binary and octal. 4
- (b) Explain in detail about memory unit. 4
- (c) What is the difference between floating point representation and fixed point representation? Explain each of them in detail. 8

**UNIT – II**

3. (a) Explain about interaction cycle. 8
  - (b) Explain in detail about Memory reference instructions. 8
- OR**
4. (a) Explain interrupt cycle. 4
  - (b) Explain timing and control. 4
  - (c) Explain the list of arithmetic micro operations. 8

**UNIT – III**

5. Explain in detail about:  
 (a) Input – Output programming. 4  
 (b) Subroutines. 4  
 (c) Assembler. 8

**OR**

6. Explain about  
 (a) Address Sequencing. 8  
 (b) Design of control unit. 8

**UNIT – IV**

7. Explain in detail about the different  
 (a) Instruction formats. 8  
 (b) Addressing modes. 8

**OR**

8. (a) Explain RISC. 8  
 (b) Explain how pipelining is handled in RISC. 8

**UNIT-V**

9. Explain in detail about  
 (a) DMA 8  
 (b) Booth Multiplication Algorithm. 4  
 (c) Hardware Algorithm. 4

**OR**

10. Explain in detail about  
 (a) Asynchronous Data Transfer. 8  
 (b) Cache memory. 4  
 (c) Priority Interrupt. 4

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Code No.3383/CBCS/M

FACULTY OF INFORMATICS

MCA II-Semester (CBCS) (Main) (New) Examination, December 2020

Subject : Computer Organization

Time : 2 Hours

Max. Marks:70

Note: Answer any Four questions.

(4 x 17<sup>1/2</sup>=70Marks)

- 1 (a) Describe the concept of complements with r's and (r-1)'s complements for each number system and give examples for each.  
(b) Explain about the instruction cycle with a program execution illustration.
- 2 (a) Elaborate on Binary coded octal numbers, Binary coded Hexa-decimal numbers, Binary coded Decimal numbers.  
(b) Describe instruction cycle with interrupts.
3. (a) Demonstrate the illustration of direct – Indirect address.  
(b) Construct a 4bit adder – subtractor.
4. (a) Construct a basic common bus to connect the computer registers.  
(b) List out arithmetic micro-operations and implement a binary adder.
5. (a) Explain about the symbolic microprogram.  
(b) Give a numerical example for addressing modes.
6. (a) Write and explain the flowchart for the selection of address for control memory.  
(b) What are the three types of CPU organizations? Explain each with an example.
7. (a) Demonstrate memory address map with an example.  
(b) Illustrate segmentation with a numerical example.
8. (a) Illustrate set-associative mapping with an example.  
(b) Explain block diagram of RAM and ROM.
9. (a) Explain programmed I/O with an example.  
(b) Discuss the concept of parallel processing
- 10.(a) Illustrate the use of DMA.  
(b) Elaborate on the steps for instruction pipeline.

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## FACULTY OF INFORMATICS

M.C.A. I-Year II – Semester (Backlog) Examination, July 2019

Subject: Computer Organization

Time: 3 hours

Max. Marks: 80

**Note:** Answer ONE question from each unit. All questions carry equal marks.

### UNIT – I

1. (a) Explain in detail about flip-flops. 8
- (b) Simplify the following expressions in (a) a sum-of-products form and (b) product-of-sums form. 8
  - (i)  $x'z' + y'z' + yz' + xy$
  - (ii)  $AC' + B'D + A'C'D + ABCD$

OR

2. (a) Convert hexadecimal number F3A7C2 to binary and octal. 4
- (b) Explain in detail about memory unit. 4
- (c) What is the difference between floating point representation and fixed point representation? Explain each of them in detail. 8

### UNIT – II

3. (a) Explain about interaction cycle. 8
- (b) Explain in detail about Memory reference instructions. 8

OR

4. (a) Explain interrupt cycle. 8
- (b) Explain timing and control. 4
- (c) Explain the list of arithmetic micro operations. 8

### UNIT – III

5. Explain in detail about:
  - (a) Input – Output programming. 4
  - (b) Subroutines. 4
  - (c) Assembler. 8

OR

6. Explain about
  - (a) Address Sequencing. 8
  - (b) Design of control unit. 8

### UNIT – IV

7. Explain in detail about the different
  - (a) Instruction formats. 8
  - (b) Addressing modes. 8

OR

8. (a) Explain RISC. 8
- (b) Explain how pipelining is handled in RISC. 8

### UNIT-V

9. Explain in detail about
  - (a) DMA 8
  - (b) Booth Multiplication Algorithm. 4
  - (c) Hardware Algorithm. 4

OR

10. Explain in detail about
  - (a) Asynchronous Data Transfer. 8
  - (b) Cache memory. 4
  - (c) Priority Interrupt. 4

FACULTY OF INFORMATICS

M.C.A. II-Semester (CBCS) (Main & Backlog) Examination, July 2019

Subject : Computer Organization

Time : 3 Hours

Max. Marks: 70

*Note: Answer one question from each unit. All questions carry equal marks.*

**UNIT-I**

- 1 (a) Discuss the working of Binary counter with an Example.  
(b) Explain the different types of Flip-Flops with their characteristic table.  
**OR**
- 2 (a) What is meant by Decoder? Construct 2 to 4 line decoder with an enable input using NAND gate.  
(b) Design a 4 to 1 line Multiplexer and explain it.

**UNIT-II**

- 3 (a) What are Arithmetic and Shift Micro operations? Explain.  
(b) Explain three state Bus system buffer.  
**OR**
- 4 (a) Briefly explain about Instruction cycle with the help of flow chart  
(b) Explain the different types of computer Instruction Formats.

**UNIT-III**

- 5 Write and explain about Pass I and Pass II with the help of flow chart of an Assembler.  
**OR**
- 6 (a) Write short notes on Subroutine and Interrupt.  
(b) Briefly explain the address sequencing of Micro programmed control unit.

**UNIT-IV**

- 7 (a) Describe the different types of Addressing modes.  
(b) Briefly explain the Instruction formats  
**OR**
- 8 (a) Briefly explain the concept of Instruction Pipeline.  
(b) Explain three segment Pipeline timing.

**UNIT-V**

- 9 (a) Explain the mechanism of Asynchronous Data Transfer.  
(b) Explain the concept of Input Output processor with a neat block diagram.  
**OR**
- 10 (a) Discuss in detail the DMA controller.  
(b) Explain the difference between Isolated I/O and Memory mapped I/O.

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