# SHRI GNANAMBICA DEGREE COLLEGE: MADANAPALLE

(AUTONOMOUS)

**Course 7: COMPUTER ORGANIZATION (MAJOR)**

**SEMESTER III**

**(W.E.F.2024-25)**

**Program: BSC (CS)**

**Hours per week: 4** **Credits: 3**

**Course Outcomes:**

Upon successful completion of the course, the students will be able to

1. Identify different types of instructions
2. Differentiate between micro-programmed and hard-wired control units.
3. Analyse the performance of hierarchical organization of memory
4. Summarize different data transfer techniques.
5. Demonstrate arithmetic operations on fixed-and floating-point numbers and illustrate concepts of parallel processing

## UNIT – I

**Register Transfer Language and Micro Operations:** Introduction-Functional units, computer registers, register transfer language, register transfer, bus and memory transfers, arithmetic, logic and shift micro-operations, arithmetic logic shift unit.

**Basic Computer Organization and Design:** Instruction codes, instruction cycle. Register reference instructions, Memory – reference instructions.

## UNIT – II

**CPU and Micro Programmed Control:** Central Processing unit: Introduction, instruction formats, addressing modes. Control memory, address sequencing, design of control unit - hard wired control, micro programmed control.

## UNIT – III

**Memory Organization:** Memory hierarchy, main memory, auxiliary memory, associative memory, cache Memory and mappings.

## UNIT – IV

**Input-Output Organization:** Peripheral Devices, input-output interface, PCI, SCSI, USB asynchronous data transfer, modes of transfer-programmed I/O, priority interrupt, direct memory access.

## UNIT– V

**Computer Arithmetic and Parallel Processing:** Data representation-fixed point, floating point, addition and subtraction, multiplication. Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline.

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**References :**


1. M. Moris Mano, "Computer Systems Architecture", 3rd edition, Pearson/ PHI.
2. Carl Hamacher, ZvonksVranesic, SafeaZaky, "Computer Organization", 5th edition, McGraw Hill.
3. William Stallings, "Computer Organization and Architecture", 8th edition, Pearson/PHI


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# SHRI GNANAMBICA DEGREE COLLEGE: MADANAPALLE

(AUTONOMOUS)

**Course 7: COMPUTER ORGANIZATION (MAJOR)- Practicals**

**SEMESTER III**

**(W.E.F.2024-25)**

**Program: BSC (CS)**

**Hours per week: 2** **Credits: 1**

## List of Experiments

1. Implement a C program to convert a Hexadecimal, octal, and binary number to decimal number vice versa.
2. Implement a C program to perform Binary Addition & Subtraction.
3. Implement a C program to perform Multiplication of two binary numbers.
4. Implement arithmetic micro-operations using logic gates.
5. Implement logic and shift micro-operations using logic gates.
6. Implement a C program to perform Multiplication of two binary numbers (signed) using Booth's Algorithms.
7. Implement a C program to perform division of two binary numbers (Unsigned) using restoring division algorithm.
8. Implement a C program to perform division of two binary numbers (Unsigned) using non- restoring division algorithm.
9. Write assembly language code for A+B*(C-D) using various instruction formats in MASM or any open-source assembler.
10. Write assembly language code for A+B*C using various addressing modes in MASM or any open-source assembler

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**Course 7: COMPUTER ORGANIZATION (MAJOR)**

**SEMESTER III**

**(W.E.F.2024-25)**

**Program: BSC (CS)**

**Question Paper – Blue Print**

**Time : 3 Hrs** **Marks : 70**

PART-A

Answer any 4 of the 8. Each Question Carries 5 marks. (4 x 5 =20)

1. Question
2. Question
3. Question
4. Question
5. Question
6. Question
7. Question
8. Question

PART-B

Answer one from each unit. Each Question Carries 10 marks. (5X10=50)

UNIT 1

9. Question

OR

10. Question

UNIT 2

11. Question

OR

12. Question

UNIT 3

13. Question

OR

14. Question

UNIT 4

15. Question

OR

16. Question

UNIT 5

17. Question

OR

18. Question

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