Academic Year: 2024-25

Course: B.Sc. (Physical Sciences) – Computer Science

Paper: Computer System Architecture

Semester: III

Name of Teacher: Dr. Pranav Dass

Teaching Plan

Week	Topic
Week 1	Data Representation and basic Computer Arithmetic: Number systems, complements, fixed and floating point representation
Week 2	Character representation, addition, subtraction, magnitude comparison
Week 3	Logic gates, Boolean algebra, combinational circuits, circuit simplification, flip-flops
Week 4	Sequential circuits, decoders, multiplexors, registers, counters and memory units **(Assignment-1)**
Week 5	Computer registers, bus system, instruction set, timing and control
Week 6	Instruction cycle, memory reference. **(Assignment-2)**
Week 7	Input-output and interrupt, Register organization
Week 8	Arithmetic and logical micro-operations
Week 9	Stack organization**, micro** programmed control and **(TEST-1)**
Week 10	Instruction formats, addressing modes, instruction codes
Week 11	Input output programming
Week 12	Machine language, assembly language
Week 13	Revision, doubt classes and **(TEST-2)**
Week 14	Revision

List of Practicals

1. Write a program to convert a number in Radix ‘R’ to radix 10 and vice versa. Test the same by

   a. Converting an unsigned number from binary, octal, hex to decimal.
   b. Converting an unsigned number from decimal to binary, octal, hex.

2. Write a program that will prompt for the input of two integer values. Then using the bitwise shift operators show the result of

   a. Left shifting the first number by the second
   b. Right shifting the first number by the second
   c. Exclusive OR of the first number by the second bitwise
   d. OR of the first number by the second bitwise
   e. AND of the first number by the second bitwise

3. Write a program that will prompt for the input of a binary value. Find out following complements.
   a. One’s complement
   b. Two’s complement

4. Write a program to print the values of a 5-bit binary up-down counter. User should be able to specify the up or down nature of the counter.

5. Write a program to implement the following binary operations

   a. Addition
   b. Subtraction using 2’s complement.