

Hemchandracharya North Gujarat University, Patan

B.E. SEMESTER – III (IT)

IT302: DIGITAL LOGIC AND DESIGN

Teaching Scheme

Theory	04 Hrs/Week
Tutorial	-
Practical	02 Hrs/Week
Total	06 Hrs/Week

Examination Scheme

Theory	100 Marks
Practical	25 Marks
Term work	25 Marks
Total	150 Marks

1. **Binary System:**

Digital computer and digital systems, Binary Number, Number base conversion Octal and Hexadecimal Number, complements, Binary Codes, Binary Storage and register, Binary Logic, Integrated Circuit.

2. **Boolean Algebra and Logic Gates:**

Basic Definition, Axiomatic Definition of Boolean Algebra, Basic Theorem and Properties of Boolean Algebra, Minterms And Maxterms, Logic Operations, Digital Logic Gates, IC digital Logic Families

3. **Simplification of Boolean Functions:**

Different types Map method, Product of sum Simplification, NAND or NOR implementation, Don't Care condition, Tabulation method

4. **Combinational Logic:**

Introduction, Design Procedure, adder, subtractor, Code Conversion, Universal Gate

5. **Combinational Logic with MSI AND LSI:**

Introduction, Binary Parallel Adder, Decimal Adder, Magnitude Comparator, Decoder, Multiplexer, ROM, Programmable Logic Array.

6. **Sequential Logic:**

Introduction, Flip-Flops, Triggering of Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Flip-Flop Excitation Tables, Design Procedure, Design of Counters, Design with State Equations

7. **Registers Transfer Logic & Micro-Operation:**

Introduction, Inter-register Transfer, Arithmetic, logic and shift Micro-Operations, Conditional Control Statements, Fixed-Point Binary Data, overflow, Arithmetic Shifts, Decimal Data, Floating-Point Data, Instruction Codes, Design of Simple Computer

8. **Registers, Counters and the Memory unit:**

Introduction, Registers, Shift Registers, Ripple Counters, Synchronous Counters, Timing Sequences, Memory Unit

9. **Processor Logic Design:**

Introduction, Processor Organization, Arithmetic Logic Unit, Design of Arithmetic and logic circuit, Design of ALU. Status Register, Design of shifter, Processor Unit, Design of Accumulator.

10. **Control Logic Design:**

Introduction, Control Organization, Hard -Wired Control, Micro-Program Control.

Reference Books:

1. Digital Logic and Computer Design By M Morris Mano
2. Principle of digital Electronics By Malvino & Leach
3. Modern Digital Electronics By R.P.Jain