Pr3. DIGITAL ELECTRONICS LAB

Total Periods	**60**	**Total Marks**	**75 Marks**
Lab. Periods:	**4 Periods /week**	**Term Works/Sessional**	**50 Marks**
Examination	**3hours**	**Sessional**	**25 Marks**

A. Rationale:

The Digital Electronics Laboratory can play a vital role in wide Varity applications in the field of microprocessor, microcontrollers & household appliances, among others. It is the inter connection among the digital components and modules. Various digital ICs are discussed. This lab includes combinational logic & sequential logic circuits and its implementations.

B. Objective:

After completion of this course the student will be able to:

1. Familiarization of Digital Trainer Kit, logic Pulser Logic Probe & Digital ICs
2. Verify truth tables of Digital gates
3. Implement various gates by using universal properties
4. Implement Half adder, Full adder, Half subtractor and Full subtractor using logic gates.
5. Know about Flip Flop,Counters,Registers
6. Study Multiplexer and Demultiplexer.
7. Study 8-bit D/A and A/D conversion.
8. Study display devices, LED, LCD, 7-segment displays.

C. List of Practicals

1. Familiarization of Digital Trainer Kit, logic Pulser Logic Probe & Digital ICs IE 7400, 7402, 7404,7408, 7432 & 7486.(draw their pin diagram and features)

2 Verify truth tables of AND, OR, NOT, NOR, NAND, XOR, XNOR gates & simplifications of Boolean gates

3 Implement various gates by using universal properties of NAND & NOR gates verify and truth table tabulate data.

4 Construct & verify operation of Half adder and Full adder using logic gates.

5 Construct & verify operation of Half subtractor and Full subtractor using logic gates.

6 Design &Implement a 4-bit Binary to Gray code converter.

7 Design & Implement a Single bit/ two bit digital comparator circuit

8 Design Multiplexer (4:1) and De-multiplexer (1:4).

9 Study the operation of flip-flops (i)S-R flip flop (ii) J-K flip flop (iii) D flip flop (iv) T flip flop

10 Realize a 4-bit asynchronous UP/Down counter with a control for up/down counting.

11 Study shift registers.

12 verify the operation 8-bit D /A and A/ D conversion & test its performance

13 Study display devices LED, LCD, 7-segment displays.

14 Mini Project : To collect data like pin configurations, display devices, Operational characteristics, applications and critical factors etc. on all digital ICs studied in theory and compile a project report throughout and submit at the end of the semester. To assemble and tests circuits using above digital ICs with test points e.g. Digital Clock / Frequency Counter / Running Glow Light upto 999/Solar cell & Opto coupler applications.

(All the above experiments are to be conducted by through study of ICs)

15. **Digital Works 3.04/** higher version is a graphical design tool that enables you to construct digital logic circuits and to analyse their behaviour through real time simulation. Its intuitive, easy to use interface makes it the ideal choice for learning or teaching digital electronics.