

### Digital Electronics Laboratory (EC – 3002)

Course Code	EC-3002	Credits-2	L -0, T-0, P-2
Name of the Course	Digital Electronics Laboratory		
Lectures to be Delivered	26 hours of Lab sessions		
Semester End Examination	<i>Max. Marks: 50</i>	<i>Min. Pass Marks:20</i>	Maximum Time:3hrs
Laboratory Continuous Assessment	Lab work 30%, Lab Record 25%, Viva/ Hands on 25%, Attendance 20%)	<i>Max. Marks: 50</i>	<i>Min. Pass Marks: 25</i>

#### Instructions for paper setter/ Candidates

Laboratory examination will consist of two parts:

- (i) Performing a practical examination assigned by the examiner (25 marks)
- (ii) Viva-voce examination (25 marks)

Viva-voce examination will be related to the practicals performed / projects executed by the candidate related to the paper during the course of the semester.

#### List of Experiments:

1. Verify truth tables of AND, OR, NOT, NAND, NOR and XOR gates.
2. Implement (i) half adder (ii) full adder using AND-OR gates.
3. Implement full adder using NAND gates as two level realization.
4. Implement full subtractor using 8 to 1 Multiplexer.
5. Verify truth tables of RS & JK flip flops and convert JK flip-flops into D type & T type flip-flops.
6. Use 555 timer as (i) monostable (ii) astable multivibrator.
7. (a) Use of 4-bit shift register for shift left and shift right operations.  
(b) Use 4-bit shift register as a ring counter.
8. Implement mod-10 counter and draw its output waveforms.
9. Implement 4-bit DAC using binary weighted resistance technique/R-2R ladder network technique.
10. Implement 8-bit ADC using IC(ADC 0800/0801).
11. (a) Implement (i) Single level clipping circuit (ii) Two level clipping circuit.  
(b) Implement clamping circuit to clamp, at peak +ve voltage/ peak -ve voltage of an input signal.

#### Additional Exercises:

1. Construct bounce less features
2. Construct a pulser of 1 Hz and 10 Hz 1k Hz and manual.
3. Construct logic state detector.
4. Construct opto - sensor based
  - a) Measurement rotational speed of motor.
  - b) Measurement time elapse between two events.
  - c) Measurement of linear velocity
  - d) Measurement of acceleration.
5. Construct a memory using TTL Circuits. Read and write data onto a memory from bus.
6. Construct and security latch that can be operated by an identity card.

**Note:** - Record to be maintained both electronically and hard copy for evaluation.