

DIGITAL ELECTRONICS LABORATORY [As per Choice Based Credit System (CBCS) scheme] SEMESTER – III (EC/TC)			
Laboratory Code	15ECL38	IA Marks	20
Number of Lecture Hours/Week	01Hr Tutorial (Instructions) + 02 Hours Laboratory	Exam Mark	80
RBT Level	L1, L2, L3	Exam Hour	03
CREDITS – 02			
Course objectives: This laboratory course enables students to get practical experience in design, realisation and verification of <ul style="list-style-type: none"> • Demorgan's Theorem, SOP, POS forms • Full/Parallel Adders, Subtractors and Magnitude Comparator • Multiplexer using logic gates • Demultiplexers and Decoders • Flip-Flops, Shift registers and Counters 			
NOTE: <ol style="list-style-type: none"> 1. Use discrete components to test and verify the logic gates. The IC numbers given are suggestive. Any equivalent IC can be used. 2. For experiment No. 11 and 12 any open source or licensed simulation tool may be used. 			
Laboratory Experiments:			
1. Verify (a) Demorgan's Theorem for 2 variables. (b) The sum-of product and product-of-sum expressions using universal gates.			
2. Design and implement (a) Full Adder using basic logic gates. (b) Full subtractor using basic logic gates.			
3. Design and implement 4-bit Parallel Adder/ subtractor using IC 7483.			
4. Design and Implementation of 4-bit Magnitude Comparator using IC 7485.			
5. Realize (a) 4:1 Multiplexer using gates. (b) 3-variable function using IC 74151(8:1MUX).			
6. Realize 1:8 Demux and 3:8 Decoder using IC74138.			
7. Realize the following flip-flops using NAND Gates. (a) Clocked SR Flip-Flop (b) JK Flip-Flop.			
8. Realize the following shift registers using IC7474 (a) SISO (b) SIPO (c) PISO (d) PIPO.			
9. Realize the Ring Counter and Johnson Counter using IC7476.			
10. Realize the Mod-N Counter using IC7490.			

11. Simulate Full- Adder using simulation tool.

12. Simulate Mod-8 Synchronous UP/DOWN Counter using simulation tool.

Course outcomes: On the completion of this laboratory course, the students will be able to:

- Demonstrate the truth table of various expressions and combinational circuits using logic gates.
- Design and test various combinational circuits such as adders, subtractors, comparators, multiplexers and demultiplexers.
- Construct and test flips-flops, counters and shift registers.
- Simulate full adder and up/down counters.

Conduct of Practical Examination:

- All laboratory experiments are to be included for practical examination.
- Students are allowed to pick one experiment from the lot.
- Strictly follow the instructions as printed on the cover page of answer script for breakup of marks.
- Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.



H. O. D.

Dept. Of Electronics & Communication
Alva Institute of Engg & Technology
Mijar, MOODBIDRI - 574 226