

6. What is Shift Register? Explain the working principles of
- (i) Serial-In, Serial-Out Shift Register and
(ii) Serial-In, Parallel-Out Shift Register. 2+4+4
7. Discuss the basic configuration of three types of PLD. Give a short description of the following with proper diagrams:
- (a) PAL (b) PLA 3+4+3=10
8. What are the two basic Data types in Verilog HDL? Discuss the Structural modeling of VHDL with an example. 4+6=10

B. Tech Odd Semester Examination, February, 2023

Electronics & Communication Engineering (3rd Semester)

Course No.: ECE-303
(Digital System Design)

Full Marks: 50

Pass Marks: 25

Time: 2 hours

- Note:**
1. Attempt any five questions.
 2. Begin each answer in a new page.
 3. Answer parts of a question at a place.
 4. Assume reasonable data wherever required.
 5. The figures in the right margin indicate full marks for the question.
 6. All the mathematical symbols and abbreviations have their usual meanings.
1. What is De Morgan's theorem? State its laws. Prove the Consensus theorem. State any two differences between synchronous and asynchronous counter. 2+2+4+2=10
 2. What is TTL logic? Explain the concept of totempole output in TTL NAND gate with proper circuit diagram. 2+8 =10
 3. Reduce the following expression in SOP form using K-Map:
$$f = \sum m(0, 11, 12, 13, 16, 17, 18, 19, 20, 21, 26) + d(2, 3, 10, 27) \quad 10$$
 4. What is a multiplexer? Implement the function $F(a, b, c) = ab + \bar{b}c$ using a 4:1 MUX. 2+8 =10
 5. What are the different types of ROMs? Differentiate Static RAM and Dynamic RAM. 6+4 =10