

SWITCHING THEORY & LOGIC DESIGN

(Common to ECE & EIE)

Time: 3 hours

Max. Marks: 70

PART - A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- Convert $(AOCB.EE)_{16}$ into decimal number.
 - Perform the subtraction $(-6)-(-13)$ using signed 2's complement representation.
 - Express $F = A + B'C$ in sum of min-terms or SOP form.
 - Implement OR gate using only NAND gates.
 - Differentiate combinational and sequential circuits.
 - What is encoder?
 - Draw the circuit of ring counter.
 - What are the differences between synchronous and asynchronous sequential circuits?
 - Give the comparison between PLA and PAL.
 - What is FPGA?

PART - B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT - I

- 2 Convert the following:

- $AB_{16} = ()_{10}$
- $1234_8 = ()_{10}$
- $10110011_2 = ()_{10}$
- $772_{10} = ()_{16}$
- $(0.513)_{10} = ()_8$

OR

- 3 Write the following binary numbers in signed 1's complement form and signed 2's complement form using 16 bit registers.
- (i) +1001010 (ii) -11110000 (iii) -11001100.1 (iv) +10000011.111

UNIT - II

- 4 Simplify the following Boolean function using tabulation method.

$$Y(A, B, C, D) = \Sigma(1, 3, 5, 8, 9, 11, 15)$$

OR

- 5 Realize the following function using only 2-input NAND gates.

$$F = A'BC' + BD + AC + B'C'D'$$

UNIT - III

- 6 Explain how a decoder can be converted into a de-multiplexer with relevant block diagrams and truth tables.

OR

- 7 Draw and explain the XS-3 subtractor using 4 bit binary adders.

UNIT - IV

- 8 Explain hazards in sequential circuits.

OR

- 9 Convert D-flip flop into T, JK and SR flip flop.

UNIT - V

- 10 Describe DRAM with an appropriate diagram and explain about its timings.

OR