

B.Tech II Year I Semester (R13) Supplementary Examinations June 2016

SWITCHING THEORY & LOGIC DESIGN

(Common to ECE and EIE)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) What is the BCD equivalent of 456?
 - (b) Draw the logic symbols of NAND and NOR gates.
 - (c) Write the advantages of Tabulation method over K-Map method.
 - (d) Write the given Boolean expression $f = A+B$ in Sum of minterms.
 - (e) Define combinational logic design.
 - (f) Define the Decoder.
 - (g) Write the difference between Latch and Flip flop.
 - (h) List asynchronous inputs of a sequential device.
 - (i) List out list of PLDs.
 - (j) Write the difference between RAM and ROM.

PART – B

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

UNIT – I

- 2 Convert the given decimal number 234 to binary, quaternary, octal, hexadecimal and BCD equivalent.

OR

- 3 Perform the following:
- (i) Subtraction by using 10's complement for the given $3456 - 245$.
 - (ii) Subtraction by using 2's complement for the given $111001 - 1010$.

UNIT – II

- 4 Minimize the following Boolean function using k-map and realize using NAND Gates $F(A, B, C, D) = \sum m(0, 2, 4, 6, 8, 10, 12, 14)$.

OR

- 5 Minimize the given Boolean function $F(A, B, C, D) = \sum m(0, 1, 2, 3, 6, 7, 13, 15)$ using tabulation method and implement using basic gates.

UNIT – III

- 6 (a) Design 8X1 Multiplexer by using 4X1 Multiplexers.
(b) Implement half adder using Decoder.

OR

- 7 Design a 4 bit adder cum subtractor using 1 bit full adders and explain.

UNIT – IV

- 8 (a) Design D Flip Flop by using SR Flip Flop and draw the timing diagram.
(b) Write the differences between combinational and sequential circuits.

OR

- 9 (a) Draw the logic symbol, characteristics table and derive characteristics equation of JK flip flop.
(b) Design T Flip Flop by using JK Flip Flop and draw the timing diagram.

UNIT – V

- 10 (a) Define asynchronous sequential design.
(b) Implement the following Boolean functions $F_1 = \sum m(0, 1, 2, 3, 8, 10, 12, 14)$, $F_2 = \sum m(0, 1, 2, 3, 4, 6, 8, 10, 12, 14)$ using PAL.

OR

- 11 Draw and explain the construction of 4X3 RAM.