Code: 13A04303

R13

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)

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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)= Σm(0, 2, 4, 6, 8, 10, 12, 14).

OR

5 Minimize the given Boolean function F(A,B,C,D) = Σ 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 = Σ m (0, 1, 2, 3, 8, 10, 12, 14), F_2 = Σ (0, 1, 2, 3, 4, 6, 8, 10.12, 14) using PAL.

OR

11 Draw and explain the construction of 4X3 RAM.

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