Code: 15A04302 **R15**

B.Tech II Year I Semester (R15) Regular Examinations November/December 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) State De Morgan's theorem.
(b) Reduce A (A + B).
(c) What is a prime implicant?
(d) State the limitations of Karnaugh map.
(e) Define combinational logic.
(f) What is priority Encoder?
(g) Define Flip flop.
(h) Define race around condition.
(i) Define address and word.
(j) List the major differences between PLA and PAL.

PART – B

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

UNIT – I

2 (a) Reduce AB + (AC)' + AB'C (AB + C).
(b) List Boolean laws and their Duals.

OR

3 (a) Convert the given expression in to canonical SOP form Y = AC + AB + BC.
(b) Realize NOT, OR, AND gates using universal gates.

UNIT – II

4 (a) Explain with an example, four variable K map.
(b) Minimize the following function and implement using AOI logic function : $F(A,B,C,D) = \prod(0,2,4,8,9,12,14)$.

OR

5 (a) Simplify using Tabular method: $Y(A,B,C,D,E) = \sum(2,3,5,7,10,12,13)$.
(b) Minimize the following function: $F(A,B,C,D,E) = \sum(0,2,4,6,9,13,21,23,25,29,31)$.

UNIT – III

6 (a) Explain the function of an encoder and list its applications.
(b) Design a Half adder using basic gates and explain its truth table.

OR

7 (a) With a neat diagram explain the operation of multiplexer.
(b) Explain the function of Digital magnitude comparator using a neat diagram.

UNIT – IV

8 (a) Draw the logic diagram of a JK flip flop and using excitation table, explain its operation.
(b) Design a 4-bit Binary ripple down-counter using a negative edge triggered D flip-flops.

OR

9 (a) Design a synchronous mod-6, counter with the following sequence: 5, 6, 7, 8, 9, 10, 5……
(b) Explain the difference between synchronous and asynchronous sequential circuits.

UNIT – V

10 (a) Explain the operation of RAM with suitable diagram.
(b) Explain the features of flash memory.

OR

11 (a) Explain EEPROM with diagram.
(b) With a neat figure, explain the features of PLA.

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