Code No. 9039 / S

FACULTY OF INFORMATICS

B.E. 2/4 (IT) I - Semester (Supplementary) Examination, June / July 2015

Subject : Digital Electronics and Logic Design

Time : 3 hours **Max. Marks : 75**

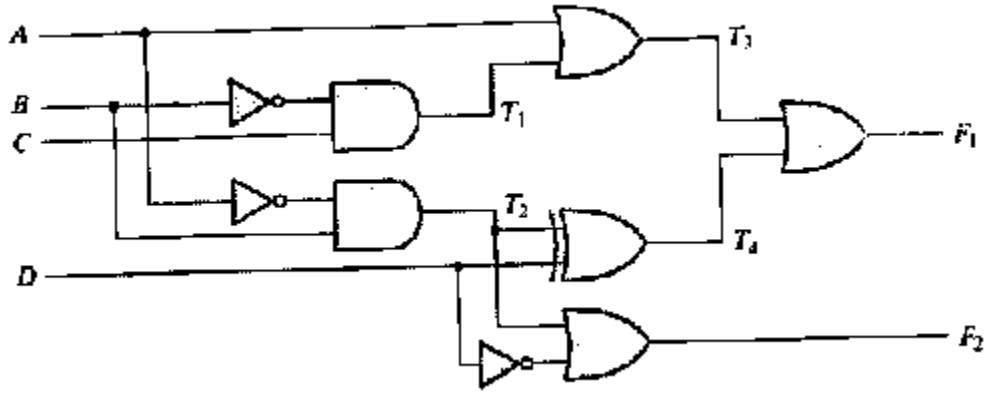
Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1 Using algebraic manipulation prove that $(x + y)(x + y') = x$. 2
2 Implement XOR and XNOR gate using NAND gates only. 2
3 Write the advantages of designing custom chips. 2
4 State and prove DeMorgans law. 3
5 What is the difference between a latch and a Flipflop. 3
6 Write VHDL code for a Half Adder circuit. 3
7 Define Minterm and Maxterm. 3
8 Draw the timing diagram of Master slave D Dlipflop. 2
9 What are the advantages of custom chips? 3
10 Define Fan-in and Fan-out. 2

PART – B (50 Marks)

11 Consider the combinational circuit shown in the figure. 7



a) Derive the Boolean expressions for T_1 through T_4. Evaluate the outputs F_1 and F_2 as a function of the four inputs. List out the truth table for 16 binary combinations along with the values for T_1 through T_4 and outputs F_1 and F_2 in the table. 3
b) Write the VHDL code for the above given combinational circuit.

12 a) Prove the following equations using the Boolean algebraic theorems : 6
i) A+A'.B + A.B' = A + B
ii) A'BC + A B' C + ABC' +ABC = AB + BC + AC
b) Implement the following Boolean function using NAND gates : 4
F(x, y, z) = (1, 2, 3, 4, 5, 7)

..2

13	a)	Explain with a neat diagram carry look ahead adder.	6
	b)	Design and implement a full adder using decoder.	4
14	a)	Show how a JK Flipflop can be constructed using a D Flipflop and other logic gates. And explain its working.	7
	b)	Write the characteristic table of JK flipflop and D Flipflop.	3
15	a)	Explain FSM as an Arbiter circuit.	7
	b)	Differentiate synchronous and asynchronous sequential circuits.	3
16	a)	Draw the internal architecture of FPGA and explain.	5
	b)	Design and implement a right shift register.	5
17		Write short notes on :	
	a)	Clock skew	3
	b)	Path Sensitizing	4
	c)	Stuck-at Model	3

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