Code No. 2263

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) I – Semester (Main) Examination, November / December 2012

Subject: Logic and Switching Theory

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. Convert the decimal number $(47.625)_{10}$ into binary, octal and hexadecimal. (2)
2. Convert the $(1101011)_2$ to hexadecimal number system. (2)
3. Realize the 4x1 multiplexer using 2x1 multiplexer. (2)
4. Express the function in canonical sum of products form F(x,y,z) – xy' + yz' (2)
5. Convert the given function in sum of max terms F(x,y,z) = xyz + xy'z' (2)
6. Realize full subtractor using Half-subtractor. (3)
7. Draw the minimal contact network for the function F(x,y,z) = xyz + xyz' + xy'z (3)
8. Distinguish between synchronous and asynchronous counters. (3)
9. Realize X-NOR gate using NAND gates. (3)
10. Write the exertation and characteristic table of JK flip flop. (3)

PART – B (50 Marks)

11.(a) Simplify the Boolean function using theorems. (5)
(i) ABC + AB' + ABCD + AB'D
(ii) (x+y) (x+y+z') (x+z+y')

(b) Express the complement of the function given in product of Maxterms and draw the F(x,y,z) = ® (0,2,4) logic diagram using NAND gates only. (5)

12.(a) Simplify the function using K-map method and realize using basic gates only. F(A,B,C,D) = Σ (0,1,2,4,5,8,10,11,14). (5)

(b) Express the function and realize with minimum num of gates F(w,x,y,z) = Σ(1,3,5,7) + Σ_d (4,8,10). (5)

13. Design a BCD – to – Excess-3 code converter and realize with minimum no. of gates. (10)

14.(a) Design a 4x16 decoder using 2x4 decoders only. (5)

(b) Write a VHDL-code to design mod-10 counter using JK flip-flops. (5)

15.(a) Write a procedure to identify whether a given function is symmetric or not. (5)

(b) Draw the contact network for the function F(w,x,y,z) = Σ(1,2,4,6,9,10,11). (5)

16. Design a combinational circuit to realize full-adder using NAND-gates only. (10)

17. Write short notes on: (10)
(a) Logic synthesis
(b) Shift registers.

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