SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act, 1956)

Course & Branch: B.E – EEE
Title of the paper: Digital Systems
Semester: IV — Max.Marks: 80
Sub.Code: 6C0038(2006-2007) — Time: 3 Hours
Date: 04-05-2009 — Session: FN

PART – A (10 x 2 = 20)

Answer ALL the Questions

1. Convert $FACE_{16}$ to Binary.
2. Simplify $F = AB + \overline{AC} + A\overline{B}C\,(AB+C)$
3. Implement two input NOR function using NAND gates.
4. What is PLA?
5. Give the logic diagram of one bit comparator.
6. What is priority encoder?
7. What is the output frequency of MOD 16 counter, if it is clocked from, 10 KHz clock input signal?
8. How many flip flops are required to design a modulo – 14 ripple counter?
9. What are the advantages of CMOS logic over TTL logic family?
10. Define fan-out and noise – margin.

PART – B (5 x 12 = 60)

Answer All the Questions

11. (a) Solve for X when $(137)_x = (5f)_{16}$ (4)
    (b) Simplify and implement the function using Basic Gates.
    $F = \overline{A}\,\overline{B}\,\overline{C} + \overline{A}\,\overline{B}\,C + \overline{A}\,B\,C + A\,B\,\overline{C} + A\,B\,C$ (5)

(c) Define speed power product of logic gate (3)

(or)

12. (a) Subtract 232 from 343 using 2's complement method. (4)
(b) Write a short note on: (i) Binary Codes (ii) Arithmetic Codes. (8)

13. Using K-map simplify the following Boolean function and implement with NAND gates. $F(A,B,C,D) = \sum m(1,3,4,8,10,12,14) + \sum d(0,2,5)$

(or)

14. Determine the msp and mps forms for the switching functions $\sum(0,1,3,7,8,9,10,11,14,15)$

15. Draw and explain the logic diagram of the following
(a) 1 x 4 demultiplexer
(b) 3 x 8 decoder.

(or)

16. (a) Explain how to perform subtraction using adders. (4)
(b) Construct a 16 x 1 multiplexer with two 8 x 1 and one 2 x 1 multiplexer using block diagram. (4)
(c) Design an octal to binary encoder circuit. (4)

17. Draw the logic circuit of 4-bit up-down ripple counter and explain its operation.

(or)

18. Draw and explain the four different types of operation (shifting data) of a 4-bit shift register.

19. Compare logic families.

(or)

20. Write a short note on different memories.