

ANNA UNIVERSITY OF TECHNOLOGY, COIMBATORE

B.E. / B.TECH.DEGREE EXAMINATIONS : NOV / DEC 2010

REGULATIONS : 2008

THIRD SEMESTER

080230012 - DIGITAL PRINCIPLES AND SYSTEM DESIGN

(COMMON TO CSE / IT)

TIME: 3 Hours

Max. Marks: 100

PART – A

(20 x 2 = 40 MARKS)

ANSWER ALL QUESTIONS

1. State Demorgans Theorem.
2. Simplify: $A+AB+\bar{A}+B$.
3. Convert FACE16 into Octal.
4. What are prime implicants?
5. Draw the circuit for Half Adder.
6. What are the modeling techniques available to build HDL Module?
7. What is logic Synthesis?
8. Compare the Combinational and Sequential Logic circuits.
9. Draw a 4-bit binary to gray code converter circuit.
10. What is the difference between PLA and PAL?
11. Define priority encoder.
12. Distinguish between Decoder and Demultiplexer.
13. Give the excitation table for JK flip-flop.
14. What is a Flip-flop? Give its types.
15. What is meant by the term State Reduction?
16. What is a binary counter?
17. What are Mealy and Moore models?

18. What is a critical race? Why should it be avoided?

19. What are the basic elements in ASM chart?

20. Define a primitive flow table?

PART – B

(5 x 12 = 60 MARKS)

ANSWER ANY FIVE QUESTIONS

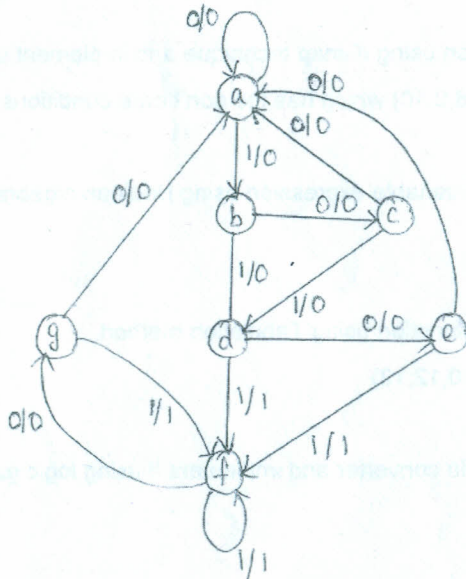
21. (a) Reduce the Boolean function using K-map technique and implement using gates $F(w,x,y,z) = \Sigma (0,1,4,8,9,10)$ which has the don't care conditions $d(w, x, y, z) = \Sigma (2,11)$ [8]
(b) Simplify the following three-variable expression using Boolean algebra.
 $Y = \Sigma m (1, 3, 5, 7)$. [4]
22. Simplify the following Boolean function using Tabulation method.
 $F(A,B,C,D) = \Sigma m (0,2,3,6,7,8,10,12,13)$
23. Design a BCD to Excess-3 code converter and implement it using logic gates.
24. (a) Design and explain the working of Full Adder circuit. [8]
(b) Write a HDL program module for Full Adder. [4]
25. A combinational circuit is defined by the functions
 $F1 = \Sigma m (3,5,7)$
 $F2 = \Sigma m (4,5,7)$
Implement the circuit with a PLA having 3 inputs, 3 product terms and 2 outputs.

26. (a) Implement the following functions using 8:1 Multiplexer.

$$F(A,B,C,D) = \Sigma(0,1,3,4,8,9,15) \quad [6]$$

(b) Write short notes on EPROM and EEPROM. [6]

27. Reduce the given State diagram using State Reduction method.



28. What is a Hazard? Explain the different types of Hazards. Discuss in detail how Hazards can be eliminated.

*****THE END*****