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B.E/B.TECH (Full Time) DEGREE END SEMESTER EXAMINATIONS, OCT/NOV/DEC 2013

COMPUTER TECHNOLOGY DEPARTMENT

II SEMESTER

CS 8201 / DIGITAL PRINCIPLES AND SYSTEM DESIGN

(REGULATION – 2012)

Time: 3 hr

Max. Mark: 100

Answer ALL Questions

Part-A (10 X 2 = 20 Marks)

- 1) Why digital systems are capable of greater accuracy?
- 2) Determine which bit, if any, is in error in the even parity. Hamming coded character 1100100. Decode the message.
- 3) Rewrite the HDL module by rectifying the syntax errors and draw the respective circuit diagram.

```

module 1ckt(x,y,A,B,C)
  inputs A,B,C,
  outputs x,y,
  wire w,
  AND G1(w,A,B),
  OR G2(x,w,y),
  NOT G3(y,C),
endmodule;

```

- 4) Design a full adder using two 2 to 4 line Decoders?
- 5) Construct a D flip-flop using JK Flip-flop
- 6) Design a circuit for generating eight repeated timing signals t0 to t7 using a counter and a decoder.
- 7) Define and differentiate critical race and noncritical race
- 8) Why asynchronous circuit is needed?
- 9) List out types of Programmable Logic devices with its applications?
- 10) Draw a PLA circuit to implement the function $F1=XY'+X'Z+X'YZ'$

Part-B (5X 16 = 80 Marks)

- 11) Design a combinational circuit to perform the following operation (16)

$$X_0X_1X_2 - Y_0Y_1Y_2 + Z_0Z_1Z_2$$

- 12) a. Simplify the Boolean Function F using K-map. Write a structural HDL to implement the reduced Boolean function. (16)

$$F(A, B, C, D)=\sum m(0, 6, 7, 9, 11, 13, 15), d(A, B, C, D)=\sum m(2, 5, 8, 10)$$

(Or)

- 12) b. Find the sum of product and product of sum for the following function using Tabulation method (16)

$$F(A,B,C) = \sum m(0,1,2,5,6,7)$$

- 13) a. (i) Implement the following Boolean Function using 8:1 Multiplexer (10)

$$F(W,X, Y, Z) = \sum m(1, 2, 6, 7, 11, 14)$$

- (ii) Write a behavioral HDL for 8:1 Multiplexer (6)

(Or)

- 13) b. (i) Explain the BCD Adder with Truth table and Block diagram? (10)

- (ii) Write an HDL code for full subtractor and test the code for any 5 inputs (6)

- 14) a. Design a counter with the following repeated binary sequence 0,1,2,4,6 using JK flip flop (16)

(Or)

- 14) b. Design and write behavioral code for switch tail ring counter(Johnson) (16)

- 15) a. Design a Asynchronous circuit with input A and B to give an output Z=1 When AB =1 1 but only if A becomes 1 before B , by drawing total state diagram and primitive flow table. (16)

(Or)

- 15) b. Explain the Race conditions and stability considerations in Asynchronous sequential circuit with example? (16)