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B.E. / B.Tech. (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2014
ELECTRONICS AND COMMUNICATION ENGINEERING BRANCH

Third Semester

EC8351 - DIGITAL ELECTRONICS AND SYSTEM DESIGN

(Regulations :2012)

Duration: 3 Hrs.

Maximum Marks 100

Answer All Questions

Part A

10 X 2 = 20 Marks

- 1 Convert decimal number 8 to biquinary code
- 2 Express the following function in terms of maxterms

$$AB' + A'B'D + A'CD'$$
- 3 Draw the circuit diagram of 2 to 4 decoder
- 4 Implement the following function using PROM

$$f(x,y,z) = \Sigma(0,2,6,7)$$
- 5 Write down the characteristic equation and excitation table of T flip flop
- 6 What are the advantages of Johnson counter over Ring counter?
- 7 Define stable state
- 8 What is pulse mode sequential circuit?
- 9 What is the propagation delay? How do you find the propagation delay?
- 10 How many 32K x 8 RAM chips are needed to provide a memory capacity of 256K bytes?

Part B

5 X 16 = 80 Marks

- 11 Reduce the following function using tabulation method and implement using universal gates

$$f(A,B,C,D,E,F)=\Sigma(6,9,13,18,19,25,27,29,41,45,57,61)$$
 - 12 a) i) Draw the circuit diagram of BCD adder and explain its function (8 marks)
 ii) Draw the circuit diagram of 4 bit carry look ahead adder and explain (8 marks)
- (or)**
- b) i) Implement the following function using PLA (8 marks)

$$f_1(A,B,C,D) = \Sigma(3,4,6,9,11)$$

$$f_2(A,B,C,D) = \Sigma(2,4,8,10,11,12)$$
 - ii) Implement the following function using Mux (8 marks)

$$f(A,B,C,D) = \Sigma(3,6,7,10,11)$$

- 13 a) i) Explain the operation of Master slave flip flop with neat circuit diagram (8 marks)
- ii) Implement the following counter sequence using D flip flop (8 marks)
- 001,100,011,110,111,001,.....

(or)

- b) Reduce the following state table to minimum number of state

| Present state | Next state | | Output |
|---------------|------------|-----|--------|
| | x=0 | x=1 | |
| a | a | b | 1 |
| b | c | e | 0 |
| c | f | g | 1 |
| d | c | a | 0 |
| e | i | g | 1 |
| f | h | i | 1 |
| g | c | f | 0 |
| h | f | b | 1 |
| i | c | e | 0 |

- 14 a) i) What is critical and non critical races? how do you overcome this problem? (8 marks)
- ii) Briefly explain essential hazards and how do you eliminate this hazards (8 marks)

(or)

- b) In asynchronous sequential network has two inputs (x_1, x_2) and one output (Z). If the input sequence 00,01,11 occurs, Z becomes 1 and remains 1 until the input sequence 11,01,00 occurs. In this case Z becomes 0 and remains 0 until the first sequence occurs again. Find the minimum primitive flow table

- 15 a) i) Explain with circuit diagram the operation of Totem Pole TTL gate (8 marks)
- ii) Explain with neat circuit diagram the operation of three state TTL gate (8 marks)

(or)

- b) i) Draw 1 bit basic RAM binary cell and explain its read/write operation? From this one bit basic memory cell construct 4x4 memory cell (10 marks)
- ii) What are the difference between static and dynamic memory? Explain how DRAM memory cell is addressed? (6 marks)