

## B. Tech Degree III Semester (Special Supplementary) Examination, August 2005

**CS/EC/EB/E/EE 304 DIGITAL ELECTRONICS**  
(2002 Admissions onwards)

Time : 3 Hours

Maximum Marks : 100

- I. (a) (i) Convert  $(83.5)_{10}$  to Hexadecimal. (2)  
 (ii) Convert  $(15.3)_8$  to binary. (2)  
 (iii) Find out  $(1100)_2 - (1111)_2$  by using 2's complement method. (3)  
 (iv) Find out  $(1101)_2 \div (1.1)_2$ . (3)  
 (b) Minimize the function by using Quine - Muclusky method.  
 $f(A,B,C,D) = \sum_m(1,4,6,9,10,11,14,15)$  (10)
- OR**
- II. (a) Draw the logic circuit of  $8 \times 1$  multiplexer and explain the working. (10)  
 (b) Minimize the expression and implement it by using only NOR gates.  
 $F(P,Q,R,S) = \pi_M(1,4,5,7,12,14,15)$   
 Don't cares = (3,6). (10)
- III. (a) Explain race around condition in JK flip flop. Explain two methods that can be used to eliminate the race around condition. (10)  
 (b) With the help of wave forms and circuit diagram explain the working of mod 8 synchronous counter. (10)
- OR**
- IV. (a) Design T flip flop using SR flip flop. (10)  
 (b) Explain the working of a 4 bit universal shift register circuit. (10)
- V. (a) Explain the working of a 3 bit carry look a head adder circuit. (10)  
 (b) Design a circuit to multiply  $(a_1a_0)_2$  and  $(b_1b_0)_2$  by using only NAND gates. (10)
- OR**
- VI. (a) Design and implement a full subtractor by using only NOR gates (10)  
 (b) Explain the working of a stable multivibrator using NAND gates. (10)
- VII. (a) Draw and explain the internal organization of  $8 \times 4$  ROM. (10)  
 (b) Implement the function.  
 $Y(a,b,c,d) = \sum_m(2,3,4,5,6,7)$  by using PLA. (10)
- OR**
- VIII. (a) Explain the working of a RAM cell implemented by using transistors. (10)  
 (b) Design a 3 bit binary to grey converter by using suitable ROM. (10)
- IX. (a) Draw and explain the circuit of 2 input TTL NAND gate. (10)  
 (b) Explain how CMOS to TTL interface can be done. (10)
- OR**
- X. (a) Draw and explain the circuit of 2 input CMOS NOR gate. (10)  
 (b) Explain the terms propagation delay, fan in, fan out. Compare the above parameters of TTL, CMOS, DTL and ECL. (10)

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