# B.Tech Degree III Semester Examination November 2005

## CS/EC/EB/EI/EE 304 DIGITAL ELECTRONICS

*( 2002 Admissions onwards)*

Time : 3 Hours Max. Marks:100

I a) Perform the following conversions:
- i) $(101)_8$ = ( )$_{16}$
- ii) $(101)_{16}$ = ( )$_2$
- iii) $(101)_{10}$ to equivalent BCD
- iv) $(101)_2$ to equivalent Graycode (12)

b) Minimize the given function using Boolean theorems.
$F(A,B,C) = A + ABC + \bar{A}B + \bar{A}\bar{B}C$ (8)

**OR**

II a) Design a circuit to count the number of ones in a 3 bit number. (10)

b) Minimize the given function using Quine Mclusky:
$F(A,B,C) = \in m(3,5,6) + d(1,7)$ (10)

III a) Given D flip flops, design a 3 bit synchronous up down counter. (12)

b) With waveforms explain the working of a 4 bit Ring counter. (8)

**OR**

IV a) Draw and explain circuit of an asynchronous counter which counts from 1 to 5. Use T flip flops and NAND gates. (10)

b) Draw the circuit of a master slave JK flip flop and explain. (10)

V a) Draw and explain one method of improving the speed of addition. (10)

b) Draw the circuit of a mono stable multi vibrator and explain with the help of necessary waveforms. (10)

**OR**

VI a) Design a circuit for a full subtractor. (8)

b) Draw a circuit to perform binary multiplication and explain with examples. (12)

VII a) Explain the different classifications of memories. (12)

b) What is PLA? Explain. (8)

**OR**

VIII a) Differentiate between:
- i) PLA and PAL
- ii) RAM and ROM (8)

b) Explain how a RAM cell stores data. (12)

IX a) Define the following terms:
- i) Sinking current ii) Noise margin
- iii) Totem pole output iv) Fan out (12)

(b) Draw the circuit of a TTL inverter and explain. (8)

**OR**

X a) Explain the following:
- i) Tristate logic ii) Propagation delay (6)

b) Draw the input and output voltage profiles of a TTL gate and explain. (8)

c) Draw and explain the circuit of an RTL. NOR gate. (6)

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