Seat No._____

GANPAT UNIVERSITY

B. Tech. Semester III Electronics & Communication Engineering

Examination NOV/DEC - 2011

EC 304: Digital Electronics

Time: 3 Hours] **[Total Marks: 70**

Instructions:

1. Attempt all questions.
2. Answers to the two sections must be written in separate answer books.
3. Figures to the right indicate full marks.
4. Assume suitable data, if necessary.

SECTION – I

Q: 1 (a) Simplify the following Boolean function. **6**

$F(W,X,Y,Z) = \sum(1,3,7,11,15)$

$d(W,X,Y,Z) = \sum(0,2,5)$

(b) Determine the prime implicants of the following function using tabulation method. **6**

$F(W,X,Y,Z) = \sum(1,4,6,7,8,9,10,11,15)$

OR

Q: 1 (a) Simplify the following Boolean function. **6**

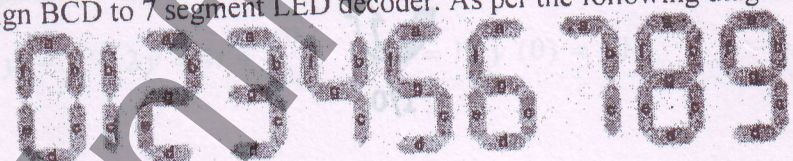
$F(W,X,Y,Z) = \sum(0,1,2,4,5,6,8,9,12,13,14)$

(b) Simplify the following Boolean function by means of the tabulation method. **6**

$F(A,B,C,D,E,F,G) = \sum(20,28,38,39,52,60,102,103,127)$

Q: 2 (a) Design Full-Adder. **6**

(b) Design BCD to 7 segment LED decoder. As per the following diagram.



6

OR

Q: 2 (a) Design Full-Subtractor. **6**

(b) Design BCD to Excess-3 code converter. **6**

Q: 3 Answer the following questions as asked.

(1) Convert 153 to octal. **1**

(2) Convert 0.6875 to binary. **1**

(3) Obtain 10's complement of 52520. **1**

(4) Obtain 2's complement of 101100. **1**

(5) Subtract M=1010100 from N=1000100. **1**

(6) Convert 586 into BCD. **1**

(7) Convert 1010101 to Gray code. **1**

(8) Convert (11001100)g to Binary code. **1**

(9) What is parity? **1**

(10) Define Reflected code. **1**

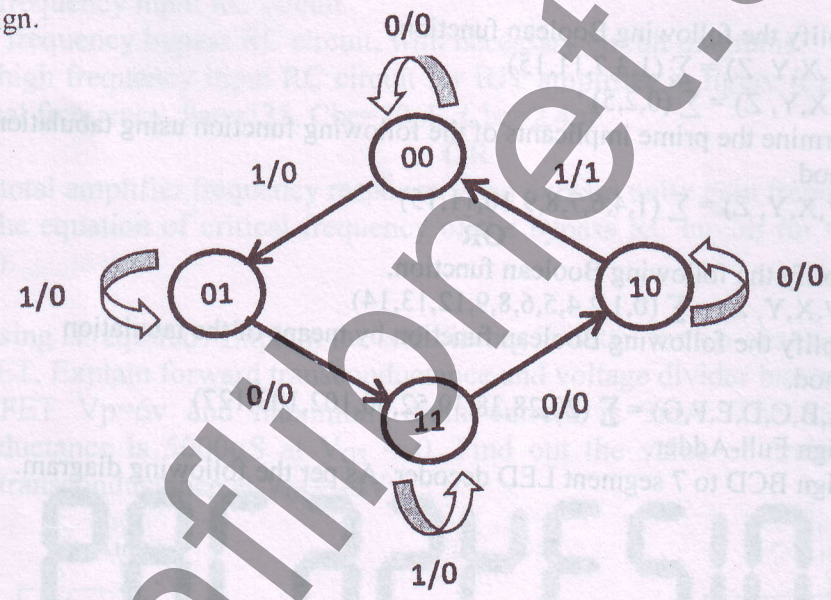
(11) Explain in brief about ASCII code.

SECTION – II

Q-4 **(a)** Simplify function F1 and F2 to minimum number of literals. **4**

A	B	C	F1	F2
0	0	0	1	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	0	1
1	0	1	0	1
1	1	0	0	1
1	1	1	0	1

(b) Design a sequential circuit from state diagram given below. Use JK flip-flop for design. **8**



OR

Q-4 **(a)** Express the following function in sum of minterms and product of maxterms. **6**
(i)F(A,B,C,D)=D(A'+B)+B'D
(ii)F(W,X,Y,Z)=Y'Z+WXY'+W'X'Z+WXZ'

(b) Explain logic gate with graphical symbol, algebraic function and truth table. **2**
(i) XOR (ii)Equivalence

(c) Draw logic diagram of master slave flip-flop explain its timing relationship. **4**

Q-5 **(a)** Draw and explain with block diagram: "Binary Ripple Counter." **7**

(b) Define the terms Fan-out, Power dissipation, propagation delay, noise margin. **4**

OR

Q-5 **(a)** Draw and explain with block diagram: "BCD Ripple Counter." **7**

(b) Write a short note on RTL circuits. **4**

Q-6 **(a)** Explain I^2L with required circuit diagram and logic diagram. **8**

(b) What is D flip-flop? Explain with necessary diagrams and tables. **4**

END OF PAPER