DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH - IT - Semester - III
SUBJECT: (IT 301) Design of Digital Circuits

Examination	**: Additional Exam**	**Seat No.**	**:**
Date	**: 14/11/2014**	**Day**	**: Friday**
Time	**: 9:30 to 10:45**	**Max. Marks**	**: 36**

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed. **[12]**

(a) Prove that x + xy = x using postulate. **[2]**

(b) $(24)_6 = (100)_b$. Determine the value of 'b'. **[2]**

(c) Whether the word 10011001 contain an error for odd parity. Justify your answer. **[2]**

(d) Find 10's and 11's complement of: $(34A)_{11}$ **[2]**

(e) Find the complement of the following functions: **[4]**
(i) F = x(y'z' + yz)
(ii) F= (A+B)' (A'+B')'

Q.2 Attempt following questions. **[12]**

(a) Simplify the following function in POS Form. **[6]**
F = Π(1,4,5,6,7,8,9,14,15,22,23,24,25,28,29,30,31). Use K-map

(b) Answer the following: **[6]**
(I) Represent the Decimal Number, 7630 in **[2]**
i) BCD Code ii) Excess-3 Code iii) 2421 Code iv) Binary
(II) Express the functions in sum of minterms and product of maxterms. **[4]**
i) F(x, y, z) = 1
ii) F(A, B, C) = (A' + B)(B' + C)

OR

(b) The Boolean expression: ***BE + B'DE'*** is a simplified version of the expression: **[6]**
A'BE + BCDE + BC'D'E + A'B'DE' + B'C'DE'.
Are there any don't care conditions? If so, what are they?

Q.3 Attempt following questions **[12]**

(a) Implement the following function with either NAND or NOR gates. Both the normal and complemented inputs are available. **[6]**
F=AB'CD'+A'BCD'+AB'C'D+A'BC'D

(b) Simplify F=∑(0,1,2,8,10,11,14,15) using Tabulation Method **[6]**

OR

Q.3 Attempt following questions **[12]**

(a) Implement the following function with either NAND or NOR gates. Use only four gates. Only the normal inputs are available. **[6]**
F = w'xz + w'yz + x'yz' + wxy'z
d = wyz

(b) Simplify F=∑(1,4,6,7,8,9,10,11,15) using Tabulation Method **[6]**