King Fahd University of Petroleum and Minerals
Department of Electrical Engineering
EE 200 Digital Logic Circuit Design
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HW No. 2 (Due Wed. March 14)

1- we have a computer that can store 3 decimal digits. How are the following two numbers stored in , BCD, 2421, Excess 3, and 8 4 -2 -1 codes:
a. 491 b. 27

2- we have the following numbers stored in a computer. What is the decimal value representing if the number is stored as
i. BCD ii. 2 4 2 1 iii. Excess 3 iv. 8 4 -2 -1
v. Binary unsigned vi. Binary signed.
a. 1000 0111 b. 0011 0100 c. 1100 1001

3- Show a truth table for the following functions:

a- $F = X\overline{Y} + YZ + \overline{X}\,\overline{Y}\,\overline{Z}$.

b- $G = \overline{X}Y + (X + \overline{Z})(Y + Z)$.

4- Determine using truth tables, whether or not each of the groups of expressions are equal:

a- $f = \overline{a}\,\overline{c} + \overline{a}b + ac$

$g = bc + ac + \overline{a}\,\overline{c}$.

b- $f = \overline{P}\,\overline{Q} + PR + \overline{Q}R$

$g = \overline{Q} + PRQ$

5- Use the Boolean algebra postulates and theorems to reduce the following expressions to minimum sum of products form. Show each step (number of terms and number of literals in minimum shown in parentheses)

a- $xy\overline{z} + xyz$ (1 term, 2 literals)

b- $x(y + \overline{w}z) + wxz$ (2 term, 4 literals)

c- $\overline{x}\,\overline{y}\,\overline{z} + \overline{x}\,\overline{y}z + \overline{x}yz + x\overline{y}z + xyz$ (2 term, 3 literals)

d- $f = ab\overline{c} + a\overline{b}c + \overline{a}bc + abc$ (3 term, 6 literals)