CMSC 250 Quiz #2 ANSWERS Wed., Sept. 8, 2004

1. [10 pnts.]Determine if each of the following pair of statements is logically equivalent by using a truth table. Use 1 for "true" and 0 for "false" to complete the truth table.

   a. $(p \wedge q) \vee r$

   b. $(p \vee r) \wedge (q \vee r)$

p	q	r	$p \wedge q$	$(p \wedge q) \vee r$	$p \vee r$	$q \vee r$	$(p \vee r) \wedge (q \vee r)$
1	1	1	1	1	1	1	1
1	1	0	1	1	1	1	1
1	0	1	0	1	1	1	1
1	0	0	0	0	1	0	0
0	1	1	0	1	1	1	1
0	1	0	0	0	0	1	0
0	0	1	0	1	1	1	1
0	0	0	0	0	0	0	0

_____YES_____(Yes or No) These statements are logically equivalent.

2. [6 pnts.]Give one possible value for the n expressed in each of the following which would make the statement true. (If there is no possible value, write the word "impossible".)

   - p = $(n \geq 1)$
   - q = $(n = 3)$
   - r = $(n \leq 7)$

   a. $\sim (p \vee \sim q)$ _____impossible_____

   b. $(p \wedge r) \wedge q$ _____3_____

3. [10 pnts.] Give the complete truth table of the following statement. Then answer the question posed below based on your results.

$(\sim (a \vee b) \vee (a \wedge \sim c)) \wedge \sim b$

				$X =$		$Y =$			
a	b	c	$a \vee b$	$\sim (a \vee b)$	$\sim c$	$a \wedge \sim c$	$X \vee Y$	$\sim b$	$(X \vee Y) \wedge \sim b$
1	1	1	1	0	0	0	0	0	0
1	1	0	1	0	1	1	1	0	0
1	0	1	1	0	0	0	0	1	0
1	0	0	1	0	1	1	1	1	1
0	1	1	1	0	0	0	0	0	0
0	1	0	1	0	1	0	0	0	0
0	0	1	0	1	0	0	1	1	1
0	0	0	0	1	1	0	1	1	1

Give values for each of the following variables to describe one situation where this statement would be true. Indicate the value of that variable by circling either the true or the false on that line.

a	TRUE	FALSE
b	TRUE	FALSE
c	TRUE	FALSE

CORRECT ANSWERS ARE (a=False, b=False, c=False) OR (a=False, b=False, c=True) OR (a=True, b=False, c=False).

4. Give an alias - a madeup name you will associate with yourself - under which you would like your grades posted. If you do not want to have your grades posted, specify the alias "None".