4 pts each × 16 = 64 pts total

QUIZ 1 - Propositional Logic

MA 240, Instructor: Jeffrey Horn, Fall 2013 NAME: SOLUTION

INSTRUCTIONS

Fill out the following truth tables correctly. Each of the output columns with a propositional logic statement at the top will be graded. You are free to use the unlabeled columns for intermediate results. (This will allow for partial credit should your final answer, in the labeled column, not be 100% correct!) Please use "0" for *false* and "1" for *true*.

Question 1

INPUTS		*OUTPUTS*	*INTERMEDIATES*				
p	q	$(\overline{p} \wedge (q \vee p)) \rightarrow \overline{q}$	$\overline{p}$	$\overline{q}$	$q \vee p$	$\overline{p} \wedge (q \vee p)$	$\overline{p} \quad (q \vee p)) \rightarrow \overline{q}$
0	0	1	1	1	0	0	1
0	1	0	1	0	1	1	0
1	0	1	0	1	1	0	1
1	1	1	0	0	1	0	1

Question 2

INPUTS		*OUTPUTS*	*INTERMEDIATES*			
p	q	$(\overline{p \wedge q}) \rightarrow (q \vee p)$	$p \wedge q$	$\overline{p \wedge q}$	$q \vee p$	$(\overline{p \wedge q}) \rightarrow (q \vee p)$
0	0	0	0	1	0	0
0	1	1	0	1	1	1
1	0	1	0	1	1	1
1	1	1	1	0	1	1

Question 3

INPUTS		*OUTPUTS*	*INTERMEDIATES*				
p	q	$(p \wedge \overline{q}) \vee (\overline{p} \wedge q)$	$\overline{p}$	$\overline{q}$	$p \wedge \overline{q}$	$\overline{p} \wedge q$	$(p \wedge \overline{q}) \vee (\overline{p} \wedge q)$
0	0	0	1	1	0	0	0
0	1	1	1	0	0	1	1
1	0	1	0	1	1	0	1
1	1	0	0	0	0	0	0

Question 4

INPUTS		*OUTPUTS*	*INTERMEDIATES*		
p	q	$(p \rightarrow q) \oplus (q \rightarrow p)$	$p \rightarrow q$	$q \rightarrow p$	$(p \rightarrow q) \oplus (q \rightarrow p)$
0	0	0	1	1	0
0	1	1	1	0	1
1	0	1	0	1	1
1	1	0	1	1	0