Quiz 2: October 11, 2018

Left Neighbor: _____ Right Neighbor: _____

Name: _____ Student ID: _____

Section TA: _____

This is a closed book quiz

Name	Equivalence	
Identity Laws	$p \wedge \mathbf{T} \equiv p$	$p \vee \mathbf{F} \equiv p$
Domination Laws	$p \vee \mathbf{T} \equiv \mathbf{T}$	$p \wedge \mathbf{F} \equiv \mathbf{F}$
Idempotent Laws	$p \vee p \equiv p$	$p \wedge p \equiv p$
Double Negative Law	$\neg(\neg p) \equiv p$	
Commutative Laws	$p \vee q \equiv q \vee p$	$p \wedge q \equiv q \wedge p$
Associative Laws	$(p \vee q) \vee r \equiv p \vee (q \vee r)$	$(p \wedge q) \wedge r \equiv q \wedge (p \wedge r)$
Distributive Laws	$p \vee (q \wedge r) \equiv (p \vee q) \wedge (p \vee r)$	$p \wedge (q \vee r) \equiv (p \wedge q) \vee (p \wedge r)$
De Morgan's Laws	$\neg(p \wedge q) \equiv \neg p \vee \neg q$	$\neg(p \vee q) \equiv \neg p \wedge \neg q$
Absorption Laws	$p \vee (p \wedge q) \equiv p$	$p \wedge (p \vee q) \equiv p$
Negation Laws	$p \vee \neg p \equiv \mathbf{T}$	$p \wedge \neg p \equiv \mathbf{F}$
Def. of implication	$(p \rightarrow q) \equiv (\neg p \vee q)$	
Def. of equivalence	$\mathbf{p \leftrightarrow q \equiv (p \rightarrow q) \wedge (q \rightarrow p) \equiv (p \wedge q) \vee (\neg p \wedge \neg q)}$	

1. **(4 points total)** Prove the absorption law, $p \vee (p \wedge q) \equiv p$, via use of the logical identities on the front of this page (without using the absorption law).

2. **(4 points total)** Give me the CNF (AKA Product of Sums) and DNF (AKA Sum of Products) for the truth table below.

p	q	r	f(p,q,r)
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

3. **(2 points total)** Give the Duals of the two canonical forms you gave as the last answer.