

QUIZ 2 FOR M325K

Name: _____
 UT EID: SOLUTION

Consider the truth table

p	q	r		CNF	DNF
1	1	1	1		$p \wedge q \wedge r$
1	1	0	0	$\neg p \vee \neg q \vee r$	
1	0	1	1		$p \wedge \neg q \wedge r$
1	0	0	1		$p \wedge \neg q \wedge \neg r$
0	1	1	1		$\neg p \wedge q \wedge r$
0	1	0	0	$p \vee \neg q \vee r$	
0	0	1	0	$p \vee q \vee \neg r$	
0	0	0	0	$p \vee q \vee r$	

- (1) [2 points] Write a conjunctive normal form for the proposition define by the truth table.

$$(\neg p \vee \neg q \vee r) \wedge (p \vee \neg q \vee r) \wedge (p \vee q \vee \neg r) \wedge (p \vee q \vee r)$$

- (2) [2 points] Write an unoptimized disjunctive normal form for the proposition define by the truth table.

$$(p \wedge q \wedge r) \vee (p \wedge \neg q \wedge r) \vee (p \wedge \neg q \wedge \neg r) \vee (\neg p \wedge q \wedge r)$$

- (3) [3 points] Complete the Karnaugh map

		r	$\neg r$
p	q	1	0
p	$\neg q$	1	1
$\neg p$	$\neg q$	0	0
$\neg p$	q	1	0

- (4) [3 points] Using the Karnaugh map write an optimized disjunctive normal form for the proposition defined by the truth table.

$$(q \wedge r) \vee (p \wedge \neg q)$$