ELEC2200 Homework #4 Spring 2021

Submit a single PDF file online (Canvas) by 10:50 a.m., 2/18/21 (Thursday).

You must show how you get your answer in each problem. The final answer only will receive no credit.

1. Use DeMorgan's theorem to complement the expression, $X(Y + \overline{Z}\,(Q + \bar{R}))$.

2. Express each of f and $\bar{f}$ defined in the truth table below, in the sum of minterms and product of maxterms.

x	y	z	f
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

3. Using Boolean algebra, simplify each of the following expressions:
(i) $f(w,x,y,z) = x + (xyz + \bar{x}\,yz) + wx + \bar{w}x + \bar{x}y$

(ii) $f(x,y,z) = y\bar{z}\,(\bar{z} + \bar{z}x) + (\bar{x} + \bar{z})(\bar{x}y + \bar{x}z)$

4. For the function, f(x,y,z) = x$\bar{y}$ + x$\bar{z}$, express f in the sum of minterms and product of maxterms.

5. Find a minimal SOP (sum of products) expression of each of the following functions: (i) f(a,b,c) = $\sum m(1,4,5,6)$, (ii) $g(A,B,C,D) = A(\bar{B} + C\bar{D}) + \bar{A}B\bar{C}D$