ELEC 204
HW#2 Solutions

2-4.

Given: $A \cdot B = 0, A + B = 1$

Prove: $(A + C)(\bar{A} + B)(B + C) = BC$

$$\begin{aligned}
&= (AB + \bar{A}C + BC)(B + C)\\
&= AB + \bar{A}C + BC\\
&= 0 + C(\bar{A} + B)\\
&= C(\bar{A} + B)(0)\\
&= C(\bar{A} + B)(A + B)\\
&= C(AB + \bar{A}B + B)\\
&= BC
\end{aligned}$$

2-8.

a) $F = \bar{A}BC + \bar{B}\bar{C} + A\bar{B}$

$= \overline{(A + \bar{B} + \bar{C})} + \overline{(B + C)} + \overline{(\bar{A} + B)}$

b) $\bar{\bar{F}} = \overline{\overline{\bar{A}BC + \bar{B}\bar{C} + A\bar{B}}}$

$= \overline{(A + \bar{B} + \bar{C})(B + C)(\bar{A} + B)}$

$= (\overline{\overline{\bar{A}BC}})(\overline{\overline{\bar{B}\bar{C}}})(\overline{\overline{A\bar{B}}})$

2-11.

a) $E = \Sigma m(0, 2, 5, 6) = \Pi M(1, 3, 4, 7)$, $F = \Sigma m(2, 4, 6, 7) = \Pi M(0, 1, 3, 5)$

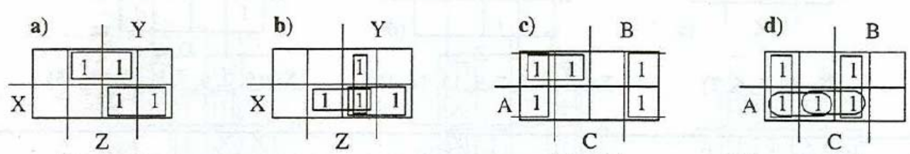
b) $\bar{E} = \Sigma m(1, 3, 4, 7)$, $\bar{F} = \Sigma m(0, 1, 3, 5)$

c) $E + F = \Sigma m(0, 2, 4, 5, 6, 7)$, $E \cdot F = \Sigma m(2, 6)$

d) $E = \bar{X}\bar{Y}\bar{Z} + \bar{X}Y\bar{Z} + X\bar{Y}Z + XY\bar{Z}$, $F = \bar{X}Y\bar{Z} + X\bar{Y}\bar{Z} + XY\bar{Z} + XYZ$

e) $E = \bar{Z}(\bar{X} + Y) + X\bar{Y}Z$, $F = Y(\bar{Z} + X) + X\bar{Z}$

2-14.



a) $\bar{X}Z + XY$ b) $YZ + XZ + XY$ c) $\bar{C} + \bar{A}\bar{B}$ d) $\bar{B}\bar{C} + BC + (AC \text{ or } A\bar{B})$