

WS5)

Joseph Specht
650812918

or + / everything
and . / overlap

1) simplify the following expressions

a) $F = (\bar{A} + B) \cdot (\bar{A} \cdot (B + A))$

$$= (\bar{A} + B) \cdot (\bar{A} \cdot B + \bar{A} \cdot A) = (\bar{A} + B) \cdot (\bar{A} \cdot B + 0) = \bar{A} \cdot (\bar{A} \cdot B) + B \cdot (\bar{A} \cdot B)$$

$$= \bar{A} \cdot B + B \cdot \bar{A} = \bar{A} \cdot B$$

$$\Rightarrow \boxed{F = \bar{A} \cdot B}$$

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

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

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

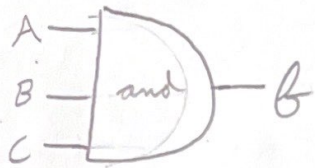
$$\Rightarrow \boxed{F = \bar{A} \bar{C} + B \bar{C}}$$

c) $F = A \cdot B + \bar{A} \cdot C + B \cdot C$

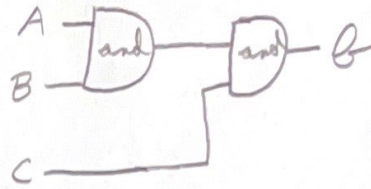
consensus theorem $\Rightarrow \boxed{F = AB + \bar{A}C}$

d) sketch following as a logic gate

i) $B = A \cdot B \cdot C$



or



ii) $B = \overline{A \cdot B + C}$

