

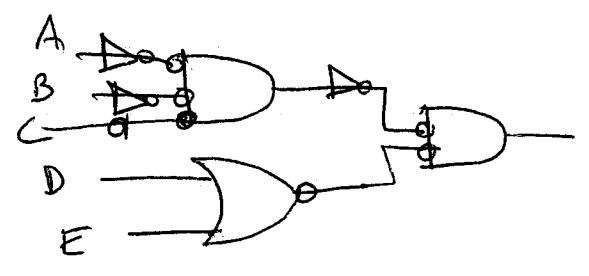
# Homework 2 Solutions

ABC	F	minterm	maxterms
000	0		$A+B+C$
001	0		$A+B+\bar{C}$
010	1	$\bar{A}B\bar{C}$	
011	1	$\bar{A}BC$	
100	1	$A\bar{B}\bar{C}$	
101	1	$A\bar{B}C$	
110	0		$\bar{A}+\bar{B}+C$
111	0		$A+\bar{B}+\bar{C}$

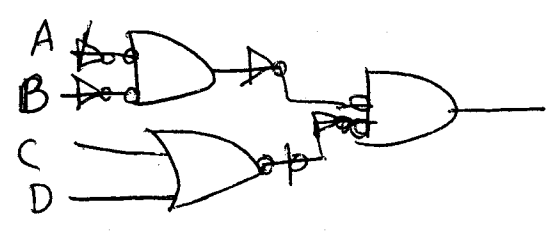
$$POS = (A+B+C)(A+B+\bar{C})(\bar{A}+\bar{B}+C)(A+\bar{B}+\bar{C})$$

$$SOP = \bar{A}B\bar{C} + \bar{A}BC + A\bar{B}\bar{C} + A\bar{B}C$$

2. a)  $F = A\bar{B}\bar{C}(D+E)$  use NOR gates

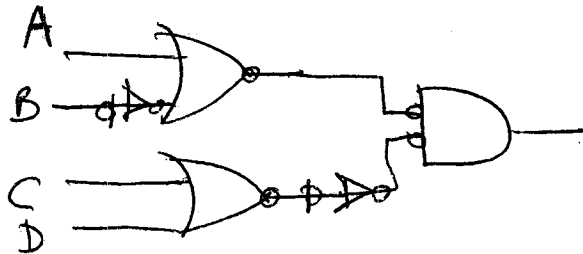


b)  $F = AB\overline{(C+D)}$  using NOR gates



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

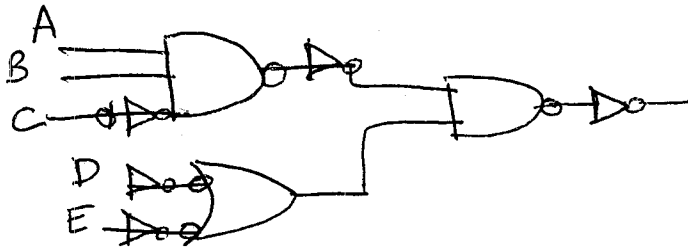
using NOR gates



note, total transistors =  $3 \times 6T + 2 \times 2T = \text{22T}$

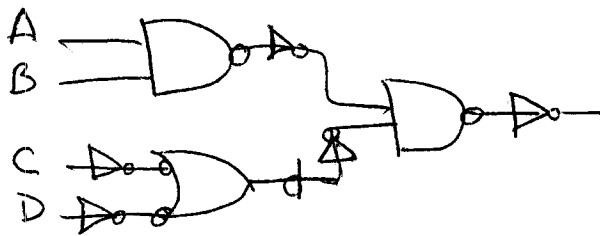
3 a)  $F = ABC \bar{C} (D + E)$

using NAND gates

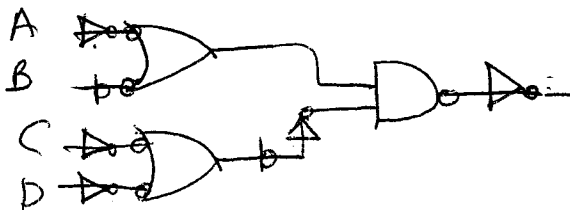


uses

b)  $F = AB \overline{C + D}$



c)  $F = (A + B)(\overline{C + D})$



uses  $18T + 5 \times 2T = 28T$   
 so, the NOR gate implementation is better