

科目名稱：數位邏輯設計 任課教師：孟孟

系/所別：電機 年級：大一 學號： 姓名：

記分	
教師簽章	

1. (a) $F_a(x, y, z) = \sum(0, 1, 3, 5, 6, 7) = z + x'y' + xy$

$z \backslash y$	00	01	11	10
0	1		1	
1	1	1	1	1

(b) $F_b(x, y, z) = \prod(1, 3, 7) = (x+z')(y'+z')$

$z \backslash y$	00	01	11	10
0			0	0
1	0	0	0	0

(c) $F_c(w, x, y, z) = \sum(0, 2, 4, 5, 6, 7, 8, 12, 13, 14, 15)$

$w \backslash yz$	00	01	11	10
00	1	1	1	1
01		1	1	
11		1	1	
10	1	1	1	1

$= x + y'z' + w'z'$

2. (a) $F_1 = A'C + A'B + AB'C + BC$

$C \backslash AB$	00	01	11	10
0		1		
1	1	1	1	1

$= C + A'B$

1. (b) $F_2 = A'B'C' + B'CD' + A'BCD' + ABC'$

CD \ AB	00	01	11	10
00	1			1
01	1			1
11				
10	1	1		1

$= B'C' + B'D' + A'CD'$

3. $F_3(A,B,C) = \Sigma(0,1,3,5,7)$

AB \ C	00	01	11	10
0	1			
1	1	1	1	

(a) $F_3 = A'B + C$

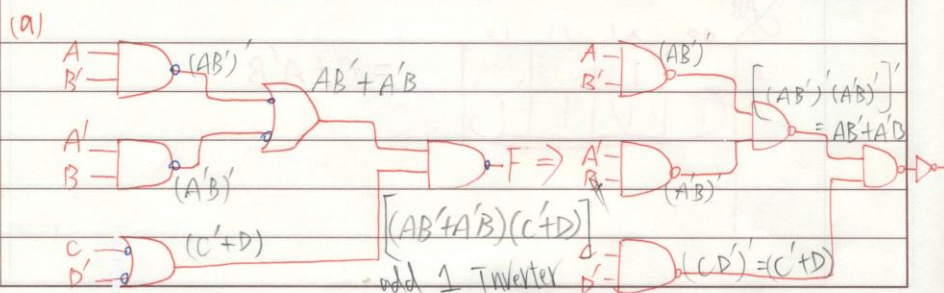
(b) $F_3 = (B'+C)(A'+C)$

4. $F_3(A,B,C,D) = \Sigma(0,2,5,11,15)$ & $d(A,B,C,D) = \Sigma(4,6,7)$

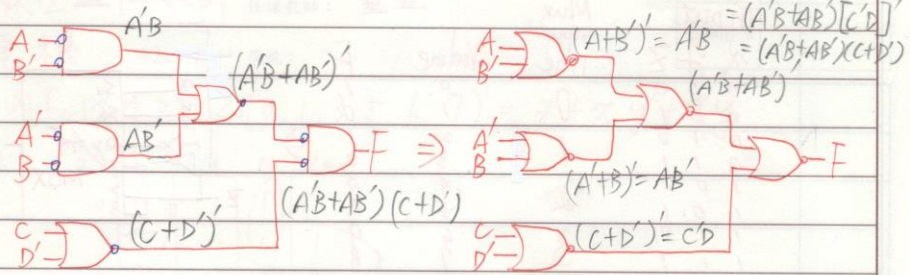
AB \ CD	00	01	11	10
00	1			1
01	X	1	X	X
11			1	
10			1	

$\Rightarrow F_4 = A'D' + A'B + ACD$

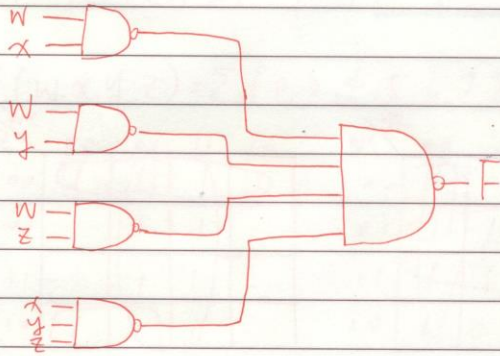
5. $\Sigma \Rightarrow \text{OR} = \Sigma \Rightarrow \text{OR}$



(b) $\Rightarrow \text{NAND} = \text{NAND}$ $F = [(A'B+AB)'+C'D]'$

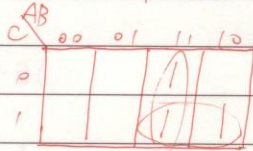


6. $F = W(x+y+z) + xyz$
 $= Wx + Wy + Wz + xyz$
 $= [(wx)'(wy)'(wz)'(xyz)']'$

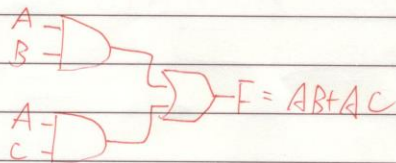


7. three input = A, B, C & one output = F

A	B	C	F
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

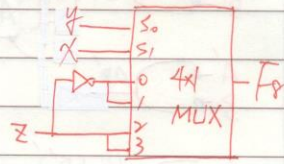


$\Rightarrow F = AB + AC$



8. $F(x, y, z) = \sum(0, 2, 5, 7)$

Input			Mux input line	Value	F
x	y	z			
0	0	0	0	0	1
0	0	1	1	1	0
0	1	0	2	2	1
0	1	1	3	3	0
1	0	0	4	4	0
1	0	1	5	5	1
1	1	0	6	6	0
1	1	1	7	7	1



9. $X = C + AB + BC'$
 $Y = AB' + A'B + AC = (A \oplus B) + C$