

(17)  $xy = (x \downarrow x) \downarrow (y \downarrow y)$   
 $x \vee y = (x \downarrow y) \downarrow (x \downarrow y)$   
 $\bar{x} = (x \downarrow x)$   
 $x \uparrow y = ((x \downarrow x) \downarrow (y \downarrow y)) \downarrow ((x \downarrow x) \downarrow (y \downarrow y))$

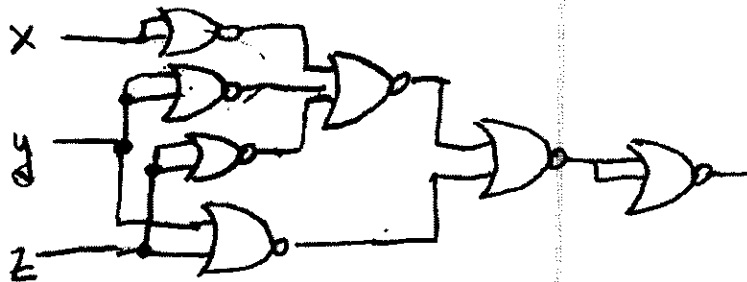
(19)

x	y	$x \downarrow y$
1	1	0
1	0	0
0	1	0
0	0	1

(21) ①  $f(x,y) = \bar{x} \vee y$



(21) ②  $f(x,y,z) = xyz \vee \bar{y}\bar{z}$



(25)  $xyz \vee x\bar{y}\bar{z} \vee x\bar{y}z \vee \bar{x}yz = \boxed{xy \vee xz \vee yz}$

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

$\bar{x}\bar{y}$   
 $\bar{x}y$   
 $x\bar{y}$   
 $x\bar{y}$

