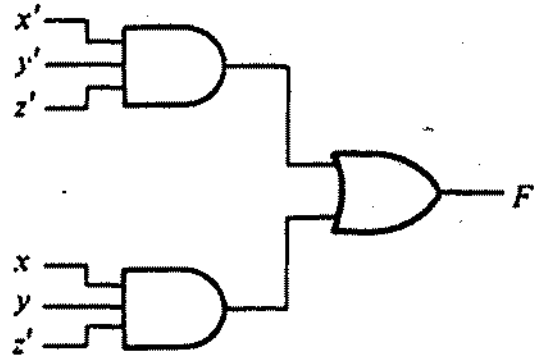
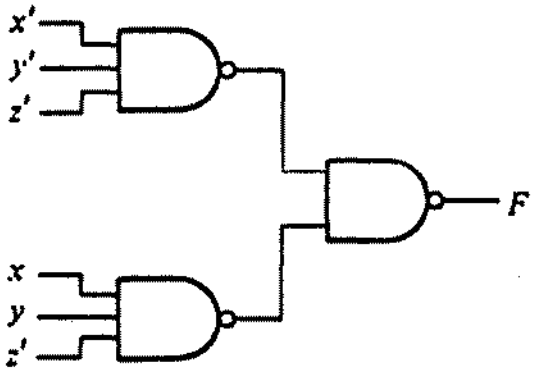
IMPLEMENTATION of f = e in SOP using

A) AND, OR, INVERT gates
e.g., f(x,y,z) = x′y′z′ + xyz′



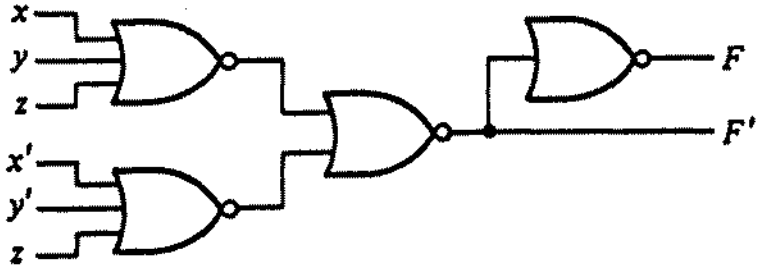
B) NAND gates
e.g., f(x,y,z) = x′y′z′ + xyz′ $= \left[(x'y'z')' \cdot (xyz')'\right]'$



C) NOR gates
(implement (f)′ and invert the output)
e.g., f(x,y,z) = x′y′z′ + xyz′

$(x+y+z)' + (x'+y'+z)'$

$f' = (x'y'z' + xyz')'$
$= (x'y'z')' \cdot (xyz')'$
$= (x+y+z) \cdot (x'+y'+z)$

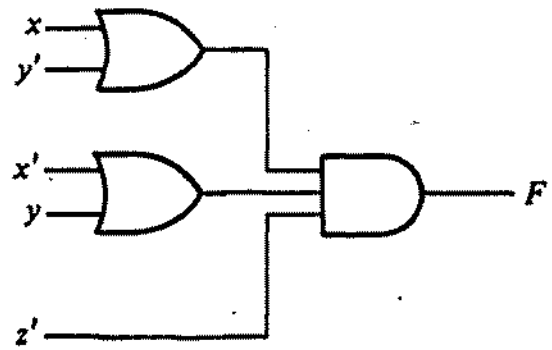


$f = (x+y+z)' + (x'+y'+z)'$
$= \left\{\left[(x+y+z)' + (x'+y'+z)'\right]'\right\}$

IMPLEMENTATION of f = e in POS using

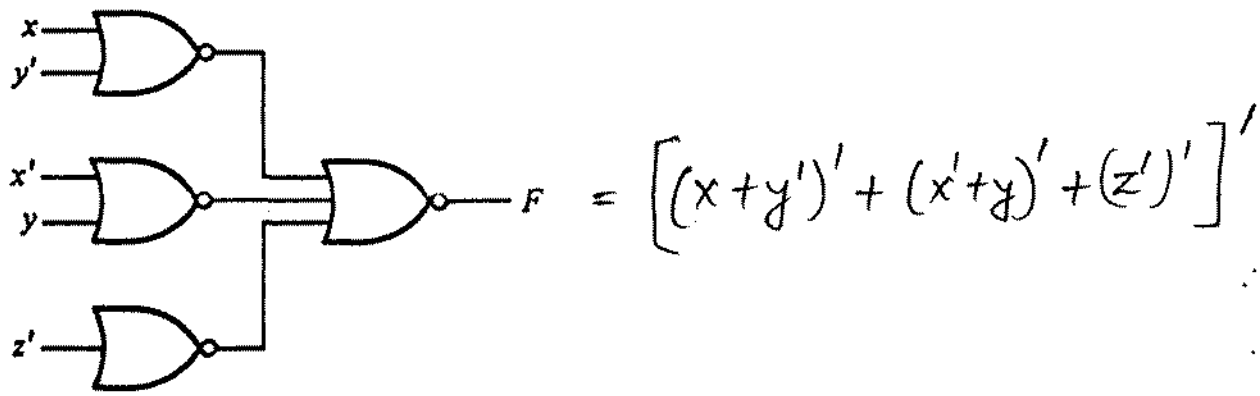
A) AND, OR, INVERT gates

e.g., f(x,y,z) = (x + y′)•(x′ + y)•z′



B) NOR gates

e.g., f(x,y,z) = (x + y′)•(x′ + y)•z′



C) NAND gates

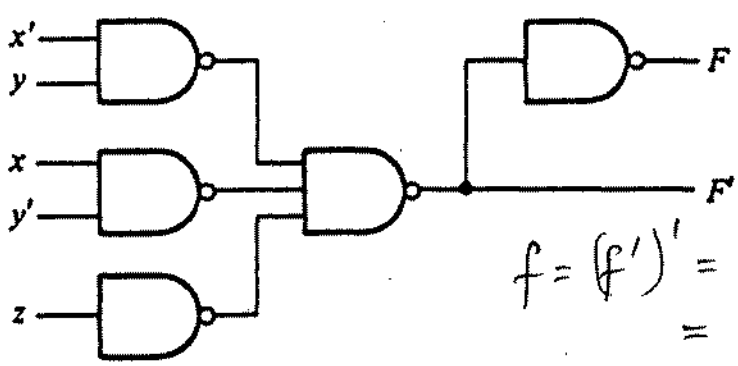
(implement (f)′ and invert the output)

e.g., f(x,y,z) = (x + y′)•(x′ + y)•z′

$f' = (x+y')' + (x'+y)' + z$

$= x'y + xy' + z$ sop form

$= [(x'y)'(xy')'z']'$



$f = (f')' = (x'y)' \cdot (xy')' \cdot z'$

$= (x+y') \cdot (x'+y) \cdot z'$