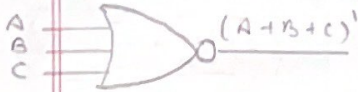
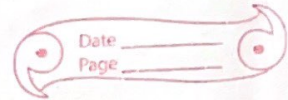


OR-Invert:



Invert-AND



20776) Simplify the following function and implement them with two level NOR gate circuit.

$$F(w, x, y, z) = wx' + y'z' + w'yz'$$

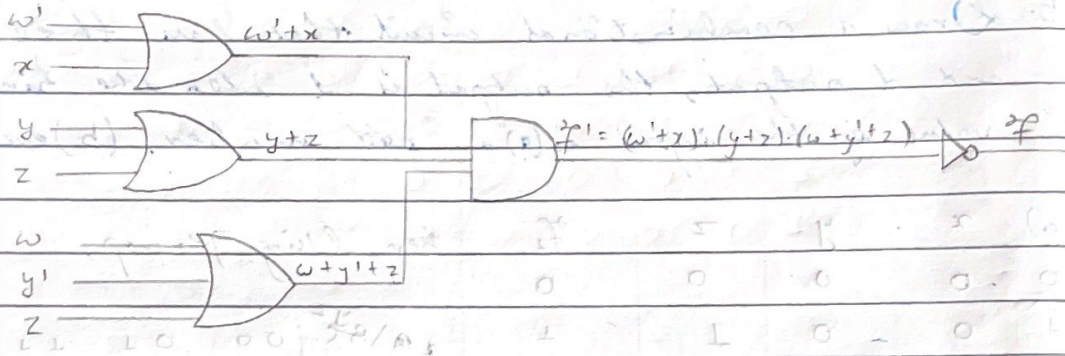
Solution:

$$F = wx' + y'z' + w'yz'$$

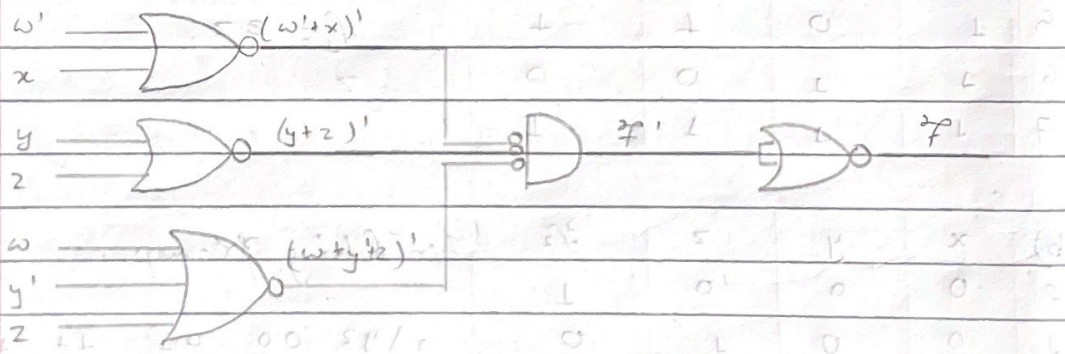
$$F' = (wx' + y'z' + w'yz')'$$

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

Step 1: Constructing a basic logic diagram:



Step 2: Converting OR gate into OR-Invert and NAND gate into Invert-AND.



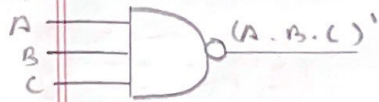
Here, $F' = [(w'+x)'] \cdot [(y+z)'] \cdot [(w+y'+z)']$

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

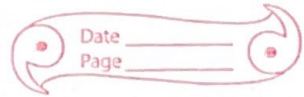
$$F' = [(w'+x) \cdot (y+z) \cdot (w+y'+z)]'$$

$$= wx' + y'z' + w'yz'$$

NAND-Invert



Invert-OR:



Step 3: Re constructing to replace OR-Invert and Invert-NAND into NOR:

