

### Question 1

a.  $F(A,B,C) = A'.B.C + B'.C + A.C'$

$$\begin{aligned} &= C.(A'.B + B') + A.C' \\ &= C.(A'+B' . B+B') + A.C' \\ &= C.(A' + B' . 1) + A.C' \\ &= C.(A'+B') + A.C' \\ &= C.A' + C.B' + A.C' \\ &= A.C' + A'.C + B'.C \end{aligned}$$

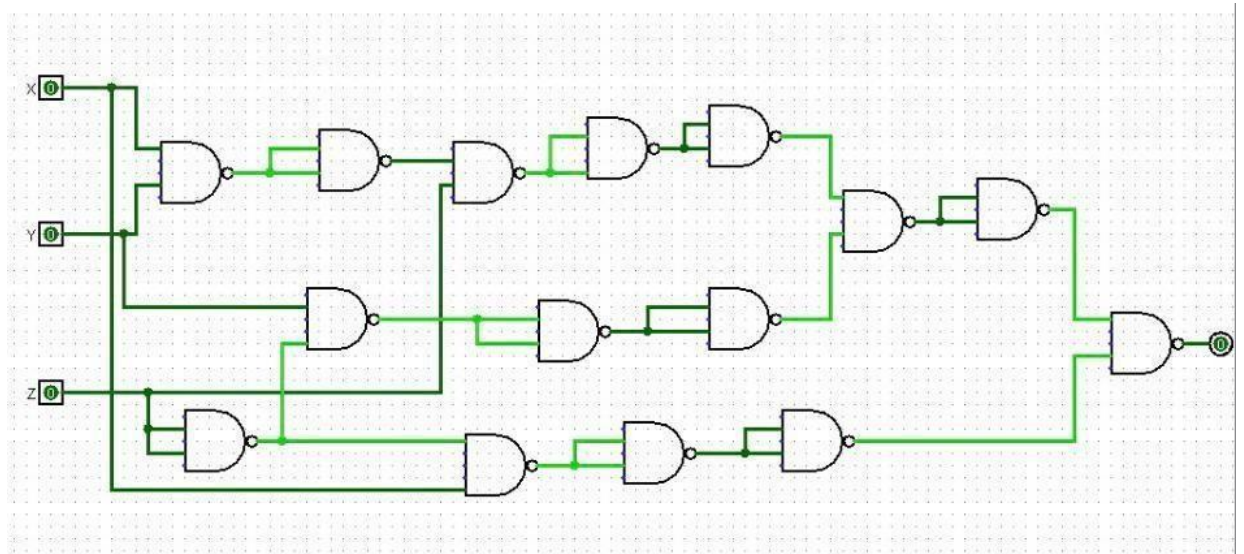
b.  $G(X,Y,Z) = (X + Y'). (X' + Y').(Y + Z')$

$$\begin{aligned} &= ((X.X')+(X.Y')+(Y'.X')+(Y'.Y')). (Y + Z') \\ &= (0 + (X.Y')+(Y'.X') + Y') . (Y + Z') \\ &= (Y'.(X+X') + Y') . (Y + Z') \\ &= (Y'.1 + Y').(Y + Z') \\ &= (Y') . (Y + Z') \\ &= (Y.Y') + (Y'.Z') \\ &= 0 + (Y'.Z') \\ &= Y'Z' \end{aligned}$$

## Question 2

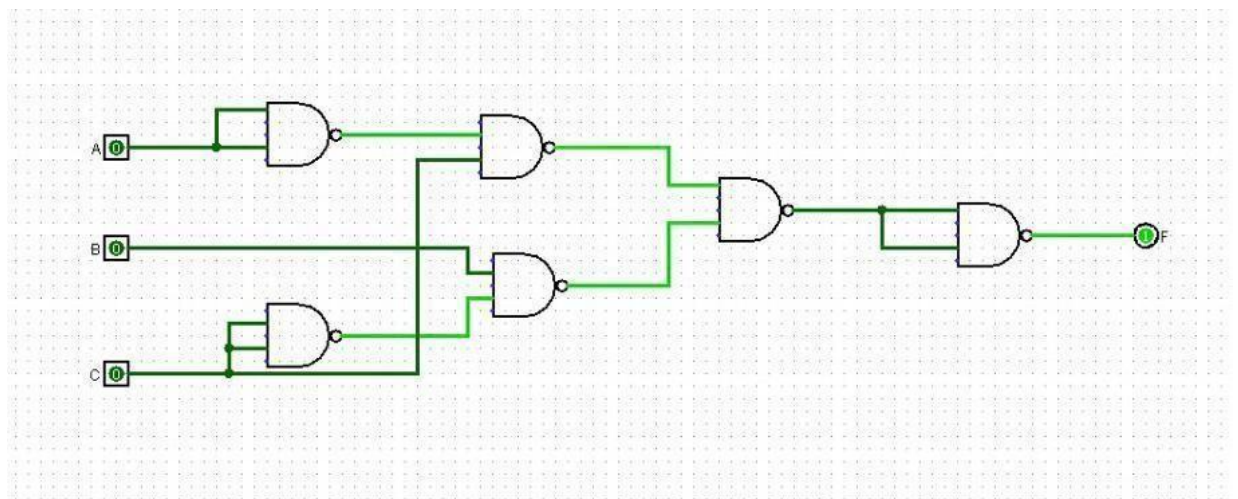
a.  $F(x,y,z) = (x.y.z) + (y.z') + (x.z')$

x	y	z	$x.z'$	$y.z'$	$x.y.z$	$x.z' + y.z' + x.y.z$
0	0	0	0	0	0	0
0	0	1	0	0	0	0
0	1	0	0	1	0	1
0	1	1	0	0	0	0
1	0	0	1	0	0	1
1	0	1	0	0	0	0
1	1	0	1	1	0	1
1	1	1	0	0	1	1



**b.  $G(A,B,C) = (A + C') \cdot (B' + C)$**

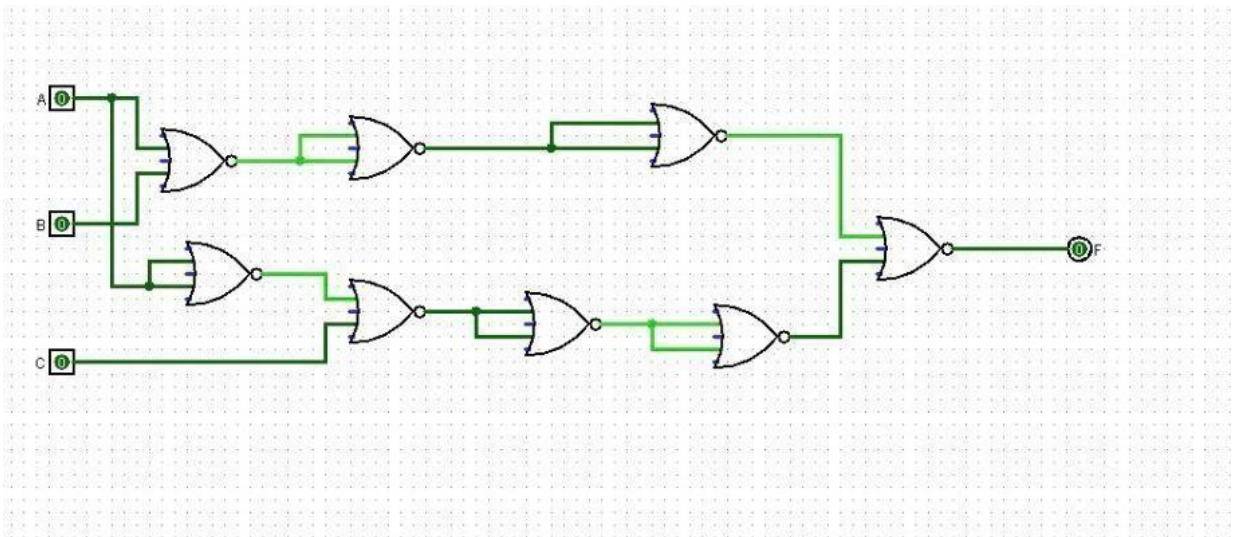
A	B	C	C'	A+C'	B'	B'+C	(A+C').(B'+C)
0	0	0	1	1	1	1	1
0	0	1	0	0	1	1	0
0	1	0	1	1	0	0	0
0	1	1	0	0	0	1	0
1	0	0	1	1	1	1	1
1	0	1	0	1	1	1	1
1	1	0	1	1	0	0	0
1	1	1	0	1	0	1	1



### Question 3

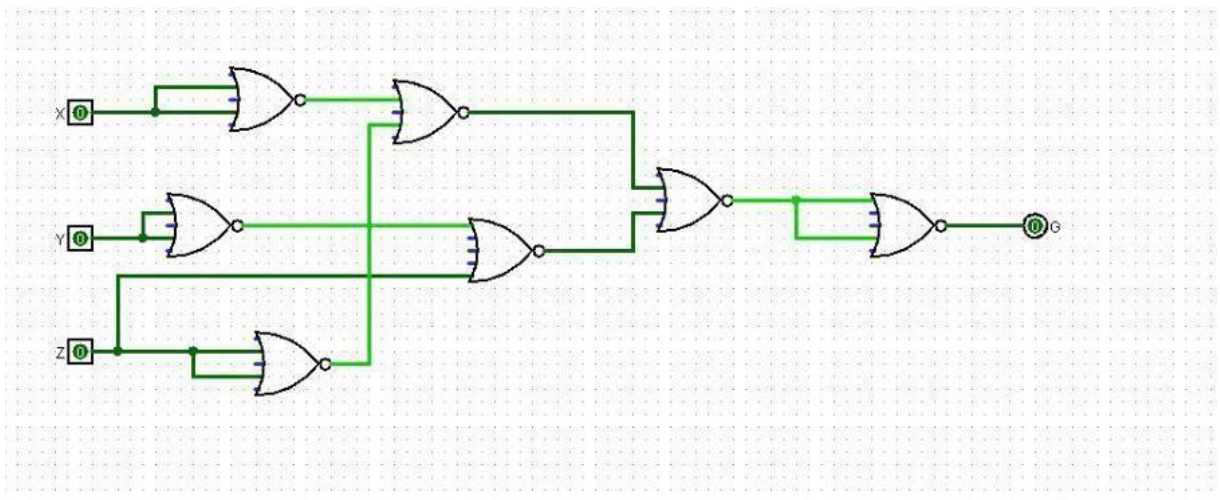
a.  $F(A,B,C) = (A' + C).(A + B)$

A	B	C	A'	A'+C	A+B	(A'+C).(A+B)
0	0	0	1	1	0	0
0	0	1	1	1	0	0
0	1	0	1	1	1	1
0	1	1	1	1	1	1
1	0	0	0	0	1	0
1	0	1	0	1	1	1
1	1	0	0	0	1	0
1	1	1	0	1	1	1



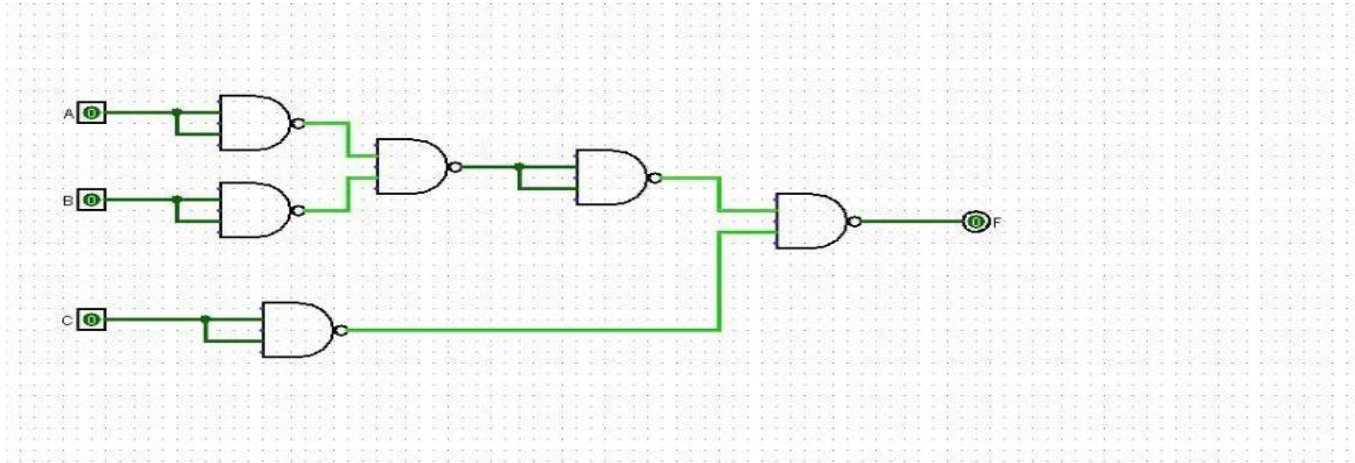
**b.  $G(x,y,z) = x.z + y.z'$**

x	y	z	x.z	z'	y.z'	x.z+y.z'
0	0	0	0	1	0	0
0	0	1	0	0	0	0
0	1	0	0	1	1	1
0	1	1	0	0	0	0
1	0	0	0	1	0	0
1	0	1	1	0	0	1
1	1	0	0	1	1	1
1	1	1	1	0	0	1



## Question 4

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



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

