## Question 1

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

= 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

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

= ((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')

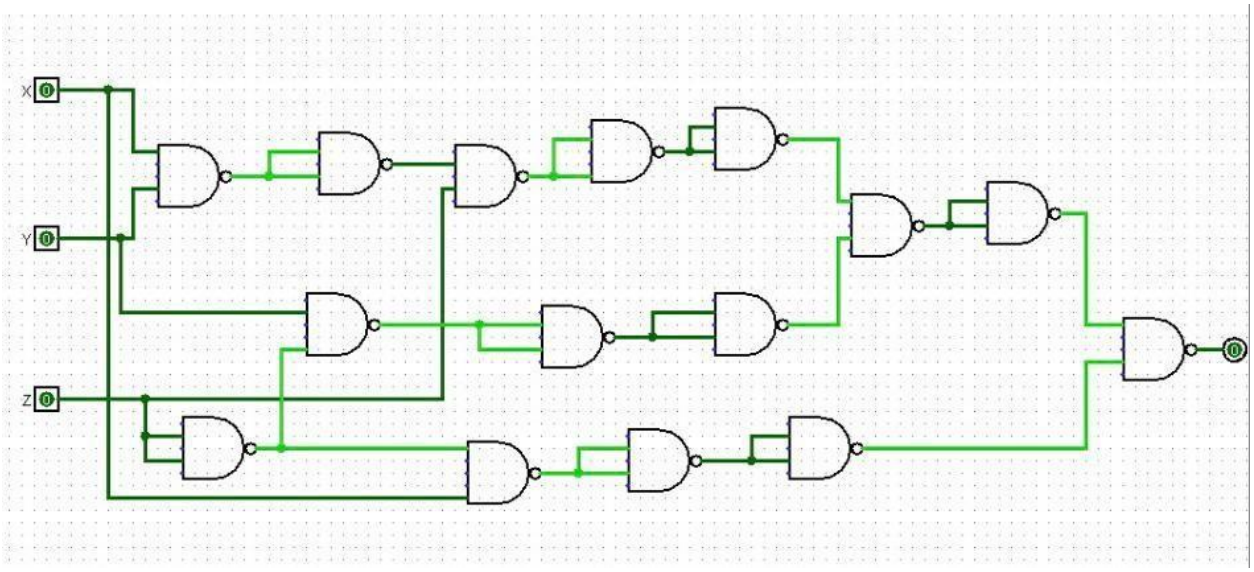
= 0 + (Y'.Z')

= Y'Z'

## Question 2

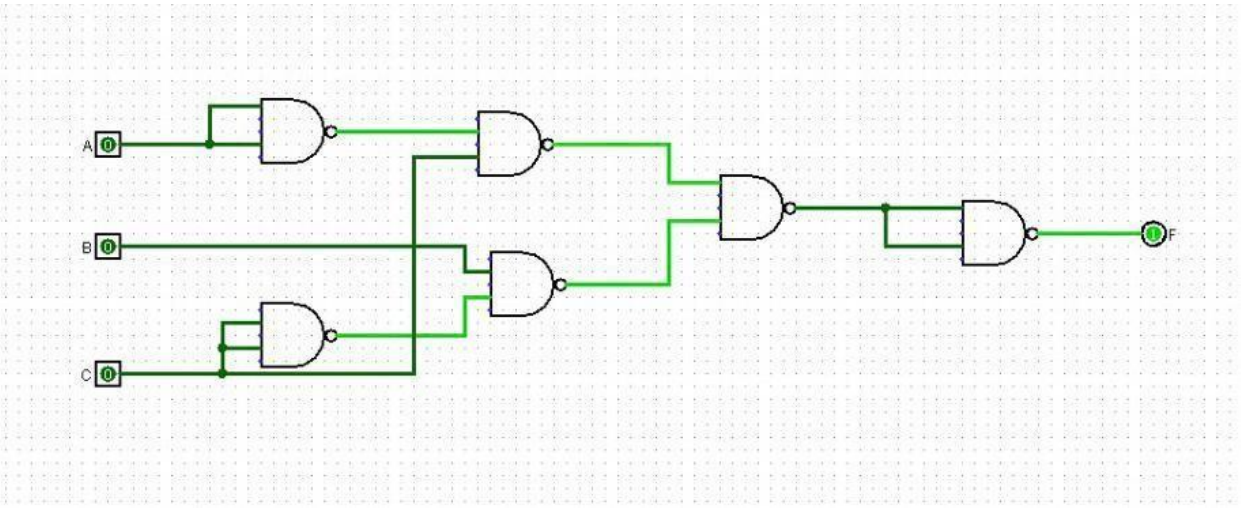
### a. F(x,y,z) = (x.y.z) + (y.z') + ( x.z')

| x | y | z | x.z' | y.z' | x.y.z | x.z'+y.z'+x.y.x |
|---|---|---|---|---|---|---|
| 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') . (B' + C)

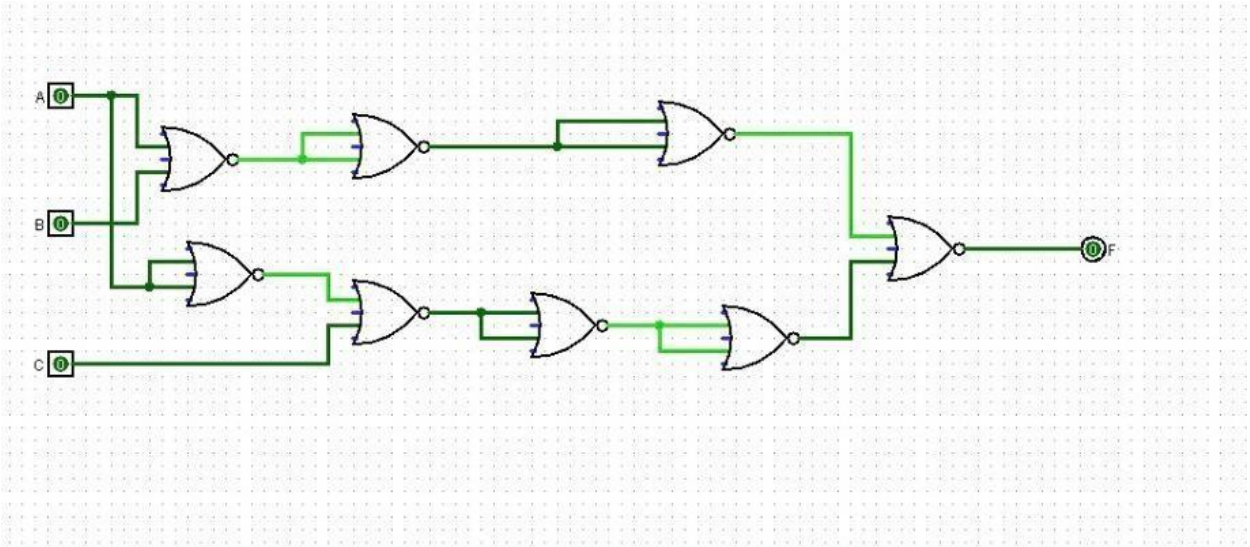
| A | B | C | C' | A+C' | B' | B'+C | (A+C').(B'+C) |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 |
| 1 | 1 |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



## Question 3

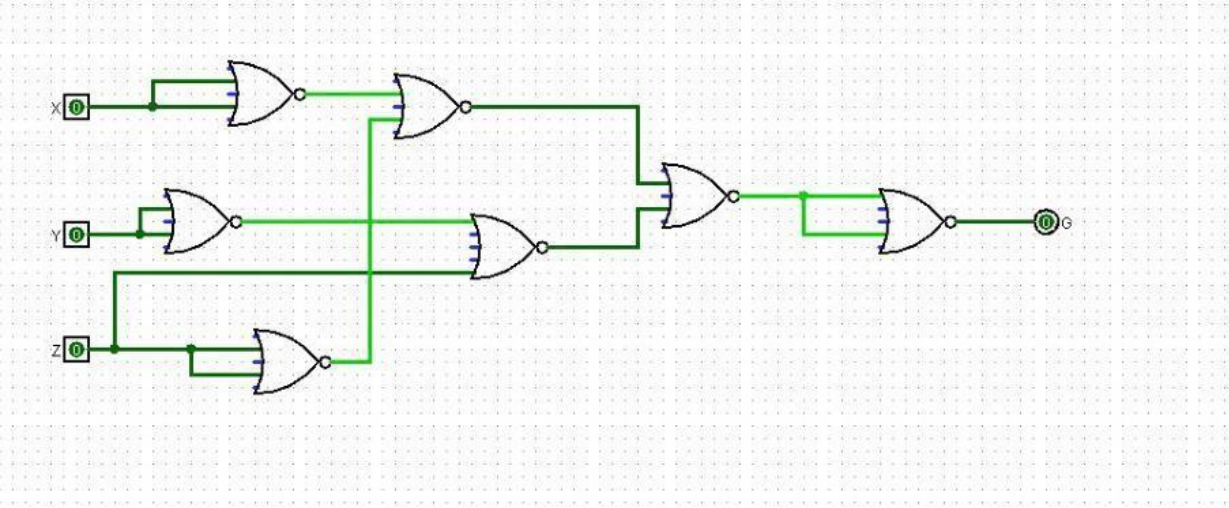
### a. F(A,B,C) = (A' + C).(A + B)

| 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 |



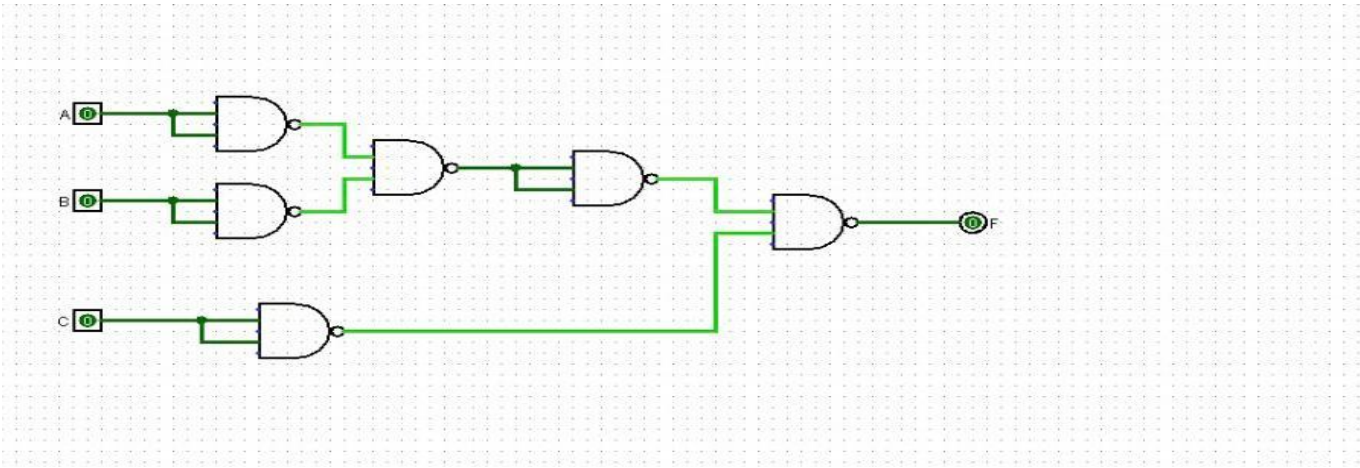
## b. G(x,y,z) = x.z + y.z’

| 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')'**