***EX***: Describe the T.T. for three input OR- gate :

ABC Z

000 0 A

B Z  001 1

C  010 1

011 1

100 1

101 1

110 1

111 1

***EX***: Describe the T.T for the following logic circuit :

A ABC Z

B  000 1

Z  001 0

C  010 1

011 0

100 1

101 0

110 1

111 1

***H.w.***: Describe the T.T for the following :

A

A  B

B Z C Z

c

A A

B B  Z

C Z

D

**The basic rules and identities of Boolean algebra :**

**1- Identities :**

a- x.0=0 b- x+0=x c- x.1=x d- x+1=1

e- x.x=x f- x+x=x g- x.x =0 h- x+x=1

i- x=x

**2-Commutative laws :**

a- x.y=y.x

b- x+y=y+x

**3-Associative laws :**

a- (x+y)+z = x+(y+z) = x+y+z

b- (x.y).z = x.(y.z) = x.y.z

**4-Distributive laws :**

a- x.(y+z) = (x.y)+(x.z)

b- x+(y.z) = (x+y).(x+Z)

**5-Absorption laws :**

a- x+x.y = x

b- x+x.y = x+y

c- x.(x+y) = x

**6-De Morgan´s theorem :**

a- x.y = x+y

b- x+y = x.y

All of these Boolean theorems useful in simplifying a logic expression that is in reducing the no. of terms in the expression .

***EX***: Prove that A.B = A+B

Sol: A.B = A+B = A+B

***EX***: Simplify the following :

Z=A(A+B)

Sol: Z = AA+AB = A+AB = A