Correction des travaux dirigés 2

Exercice 1 :

|  |  |  |  |
| --- | --- | --- | --- |
| A | B | C | S |
| 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 0 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 |

Exercice 2 :

. non (a ou b) => non a et non b => non(non a ou non b )

* a et b

. non ( a et b) =>non a ou non b => non(non a ou non b)

=>a ou b

Exercice 3 :

F0=0 , F1=ab , F2= a+b , F3= a+b + ab , F4= , F5=

F6= + a+b

Exercice 4 :

Négation d’une somme logique :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| a | b | A + b |  | . |
| 1 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 1 | 1 |
| 1 | 1 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 |

Négation d’un produit logique :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| a | b | a . b |  | + |
| 1 | 0 | 0 | 1 | 1 |
| 0 | 0 | 0 | 1 | 1 |
| 1 | 1 | 1 | 0 | 0 |
| 0 | 1 | 0 | 1 | 1 |

Exercice 5 :

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x |  | y |  | X ꚛ y | y + x |
| 1 | 0 | 1 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 0 | 0 |
| 1 | 0 | 0 | 1 | 1 | 1 |
| 0 | 1 | 1 | 0 | 1 | 0 |

Exercice 6 :

F1=xy + yz + xz

|  |  |  |  |
| --- | --- | --- | --- |
| x | y | z | F1 |
| 1 | 1 | 1 | 1 |
| 1 | 1 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 0 | 0 | 0 |
| 0 | 1 | 1 | 1 |
| 0 | 1 | 0 | 0 |
| 0 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 |

F2=x + yz + T

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x | y | z | T | F2 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 1 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 1 |
| 0 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 0 | 1 |
| 1 | 0 | 0 | 1 | 1 |
| 1 | 0 | 1 | 0 | 1 |
| 1 | 0 | 1 | 1 | 1 |
| 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 0 | 1 | 1 |
| 1 | 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 |

F3=(x+y)( + y + z)

|  |  |  |  |
| --- | --- | --- | --- |
| x | y | z | F3 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 1 |
| 0 | 1 | 1 | 1 |
| 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 |

F4= () (x+ + z ) y

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x | y | z | T | F4 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 1 | 0 | 0 | 1 |
| 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 |
| 0 | 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 | 0 |
| 1 | 0 | 1 | 0 | 0 |
| 1 | 0 | 1 | 1 | 0 |
| 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 0 | 1 | 1 |
| 1 | 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 0 |

Exercice 7 :

F1  = ( a.b + c )(a+)

= (a.b + c ) (a. + )

= aba + ab + ca + c

= ca + c

F2 = a +  ( + c + d ) +

= a+ + c + d +

=( + 1 ) + a + c + d

=+ a + (c + d)

F3 = abc + + +

= abc +

= 1

Exercice 8 :

F1 = bd + ab + bc + acd +

F2 = + + + a +

= c + +

F3 = + + +

= c + ( + ac )

= c +

Exercice 9 :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 00 | 01 | 11 | 10 |
| 0 | 0 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 | 1 |

F1 = a + a

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 00 | 01 | 11 | 10 |
| 0 | 0 | 0 | 1 | 0 |
| 1 | 1 | 1 | 1 | 0 |

+

F2 = ab + + bc

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 00 | 01 | 11 | 10 |
| 00 | 1 | 0 | 0 | 1 |
| 01 | 0 | 0 | 1 | 1 |
| 11 | 0 | 1 | 0 | 0 |
| 10 | 1 | 0 | 0 | 1 |

F3=+++++++

= ++++