**Task 1: 1-bit Full Adder**

b)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A | B | Cin | Sum | Cout |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 1 |
| 1 | 0 | 0 | 1 | 0 |
| 1 | 0 | 1 | 0 | 1 |
| 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 |

c) Sum of products

Sum = **A’B’Cin + A’BCin’ + AB’Cin’ +ABCin**

Cout = A**’BCin +AB’Cin +ABCin’ +ABCin**

D) K-Map for Sum

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

We can’t minimize the sum values of the k-map

Sum = **A’B’Cin + A’BCin’ + AB’Cin’ +ABCin**

K- Map for Cout

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

Cout = **AB + BCin+ ACin**



f)

