DLD Sessional-03

Detect 4-bit Prime Number

Experiment – 4

① Detect 4 bit prime number

যেটা Prime number সেখানে 1 দেখাবে।

Input				Output (Prime)
A	B	C	D	
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	1
1	0	0	0	
1	0	0	1	
1	0	1	0	
1	0	1	1	
1	1	0	0	
1	1	0	1	
1	1	1	0	
1	1	1	1	

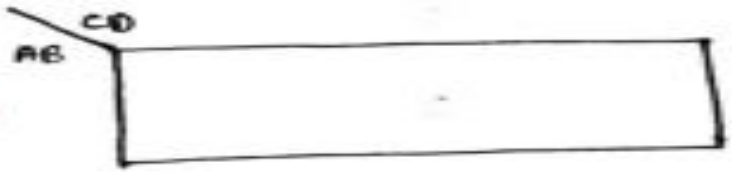
Detect 4-bit Prime Number (2)

$F = \Sigma\,(2, 3, 5, 7, \text{---})$

↓

Sum of product

Kmap :



Minimized Expression

F =

Circuit Diagram :

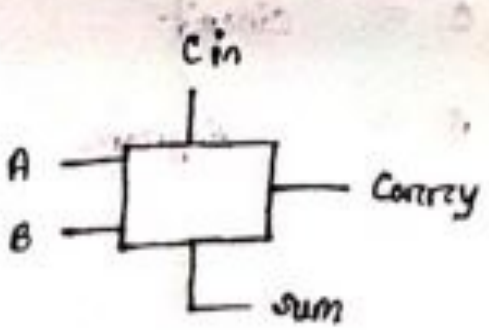
Requirements :

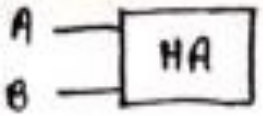
Full Adder using Basic Gates

b) Full Adder using Basic gates

Objective :

1 bit full adder ⇒ IC



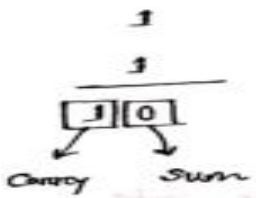


Half Adder

Full Adder using Basic Gates (2)

Truth Table :

Cin	A	B	Carry	Sum
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1



$C = \Sigma (\quad) \longrightarrow$ Kmap

$S = \Sigma (\quad) \longrightarrow$ Kmap

Minimizal Expression

C = circuit

S = diagram

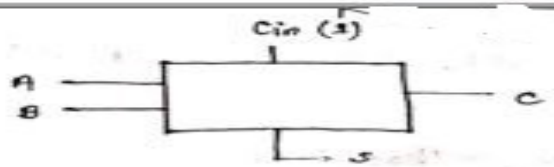
Full Subtractor using Basic Gates

A − B

↘ $\overline{B} + 1$

↘ $A + \overline{B} + 1$

2's complement



Ex name : Design 1 bit Full subtractor using Basic gates.

Objective :

Truth Table :

Bin	A	B	Bout	Diff
0	0	0	0	0
0	0	1	1	1
0	1	0	1	1
0	1	1	1	0
1	0	0	0	1
1	0	1	0	0
1	1	0	0	0
1	1	1	1	1