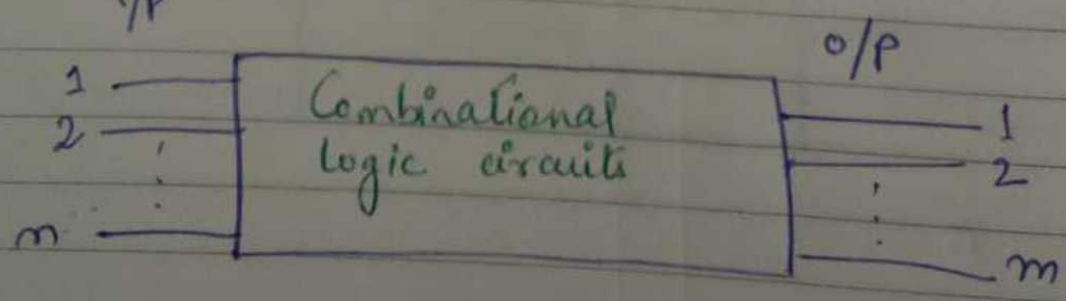
COMBINATIONAL CIRCUITS

↳ output is dependent upon combination of input variables.

↳ Does not use any memory.

↳ It can have 'n' no. of inputs & 'm' no. of outputs.

↳ eg:- Adders & subtractors
Decoders
Comparators
MUX
Code Converters
ROM
PLA
PAL



COMPARISION BETWEEN COMBINATIONAL & SEQUENTIAL CKTS

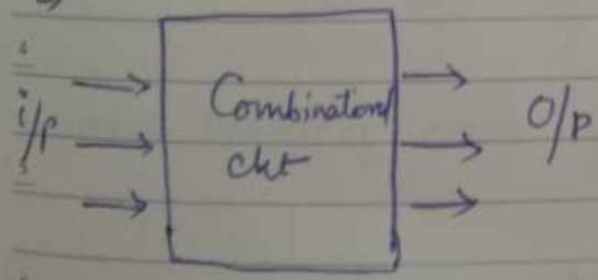
Combinational

↳ O/p is dependent on the present input

↳ ex:- Adder

$$\begin{array}{r} 1 \\ +\,0 \\ \hline 1 \end{array}$$

↳



Sequential

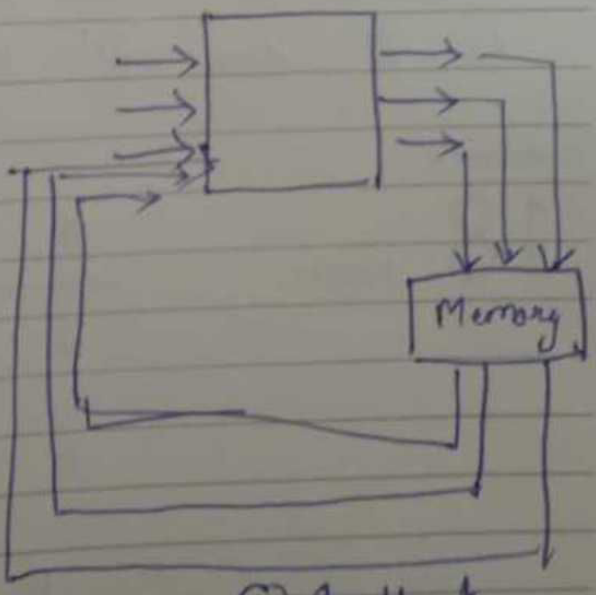
↳ O/p dependents on the present i/p as well as previous O/p or O/ps

↳ Counter (ex)

+1 to the previous O/p

If o/p is 5 that means previous O/p was 4 to which 1 is added

↳

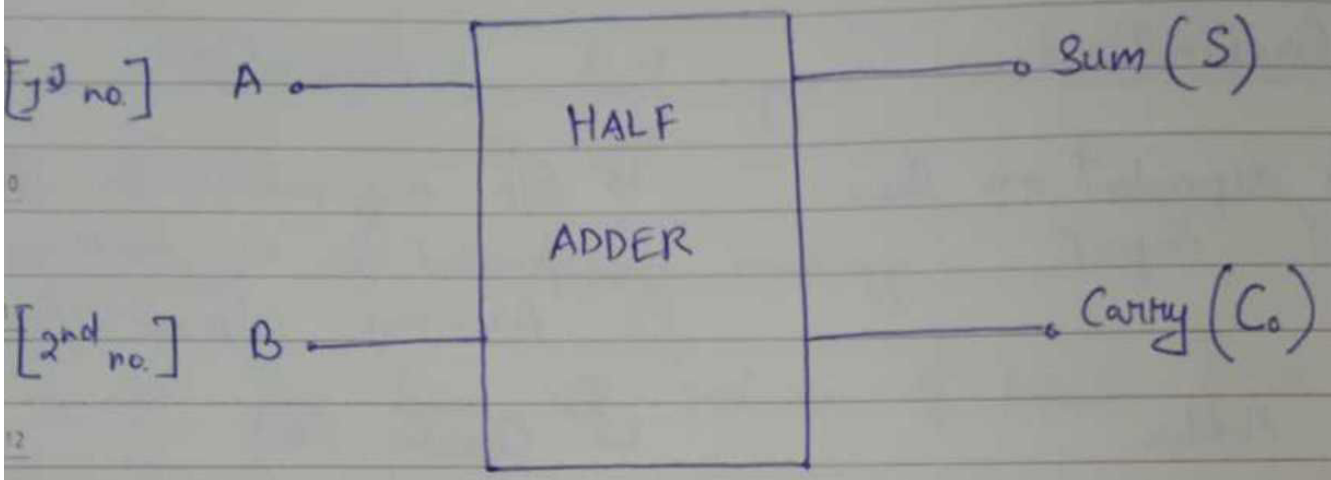


⊕ Feedback.

(229-136) WK 33

17 SATURDAY • AUGUST

HALF ADDER



$S = A \oplus B$

$C_o = A.B$

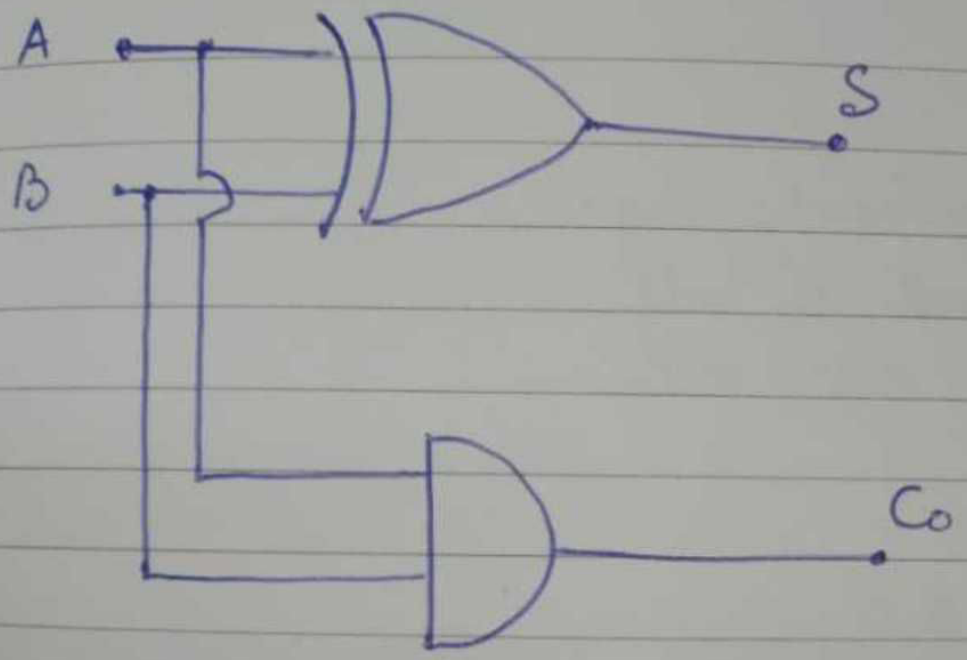
- used to add a single bit nos.
- It does not take carry from previous sum.

(230-135) WK 33

18 SUNDAY

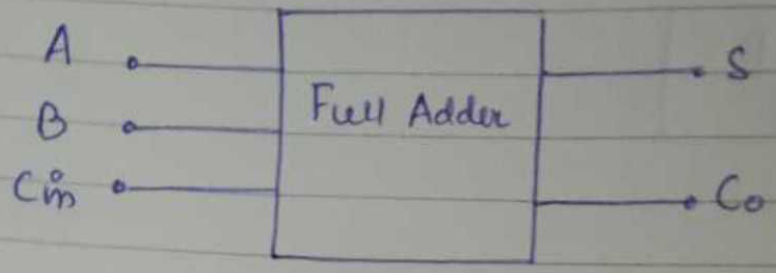
A	B	S	C_o	
0	0	0	0	Binary Addition
0	1	1	0	
1	0	1	0	
1	1	0	1	

$$S = A \oplus B$$
$$C_o = A \cdot B$$



20 TUESDAY • AUGUST

FULL ADDER :—



↳ Full Adder is a arithmatic logic circuit ~~dog~~ designed to add two single bit nos. with a carry.

A 0 0
B 0 1
C 0 1
① 0

T.T.

A	B	Cin	S	Co
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

Sum

A \ BCin	00	01	11	10
0	0	(1)	0	(1)
1	(1)	0	(1)	0

Checkboard configuration

$S = A \oplus B \oplus C_{in}$

Carry out

A \ BCin	00	01	11	10
0	0	0	1	0
1	0	1	1	1

$C_o = BC_{in} + AB + AC_{in}$

$= = AB + BC_{in} + C_{in}A.$