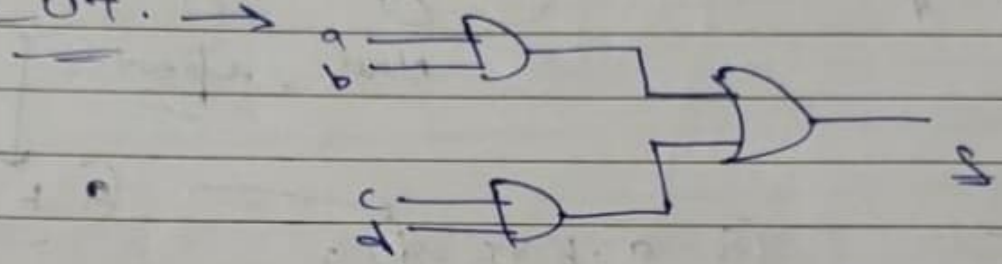
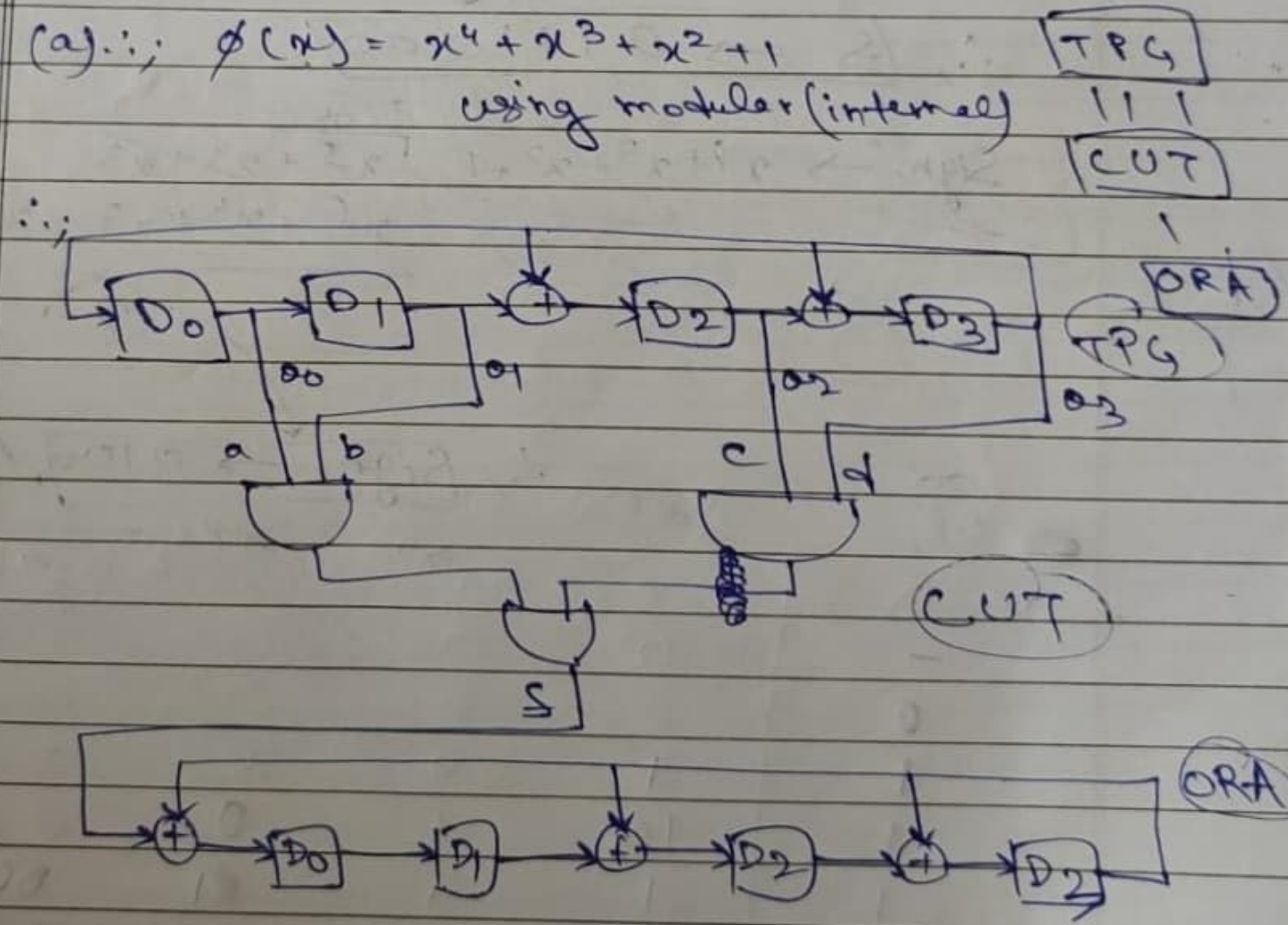
Q. For the CUT shown below, design the BIST architecture as per the following specifications.
(a) use Modular LFSR as TPG with char. poly. $x^4 + x^3 + x^2 + 1$ ($\phi(x)$) & seed = 0001.
(b) Use SISR as ORA with char. poly. $x^4 + x^3 + x^2 + 1$ & determine the signature.

CUT. →



Ans. (a). ∵ $\phi(x) = x^4 + x^3 + x^2 + 1$

using modular (internal)



∴ For 5 sequence;

CLK cycle	Q_0	Q_1	Q_2	Q_3
Seed	0	0	0	1
↑	1	0	1	1
↑	1	1	1	0
↑	0	1	1	1
↑	1	0	0	0
↑	0	1	0	0
↑	0	0	1	0

Now, repeats.

(a b c d)

$(S = a \cdot b + c \cdot d)_2$

∴ $S \rightarrow 0111000$

∴ Sign. $\rightarrow x^6 + x^3 + x^2 + 1$

$$x^6 + x^3 + x^2 + 1 \;\overline{)\; x^5 + x^4 + x^3 \;(\; x}$$

$$x^5 + x^4 + x^3 + x$$

$$x$$

∴ Sign. $\rightarrow 0100$, Ans.

OR;

m (t) = 5	Q_0	$Q_1 \rightarrow (Q_0)$	$Q_2 \rightarrow (Q_1 \oplus Q_3)$	$Q_3 \rightarrow (Q_2 \oplus Q_3)$
–	0	0	0	0 → seed
0	0	0	0	0
1	1	0	0	0
1	1	1	0	0
1	1	1	1	0
0	0	1	1	1
0	1	0	0	0
0	0	1	0	0

⇒ Sign. = 0100. Ans