**Elements Of Computing System - 1**

**End Semester Project** **Report**

*Submitted By:*

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*In partial fulfillment for the award of the degree*

Of

**BACHELOR OF TECHNOLOGY**

IN

**ARTIFICIAL INTELLIGENCE**



AMRITA SCHOOL OF ENGINEERING, BANGALORE

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BANGALORE –560035

FEB 2022

**Faculty: Ms. Meena Belwal Date: February 16,2022**

**Question-1**

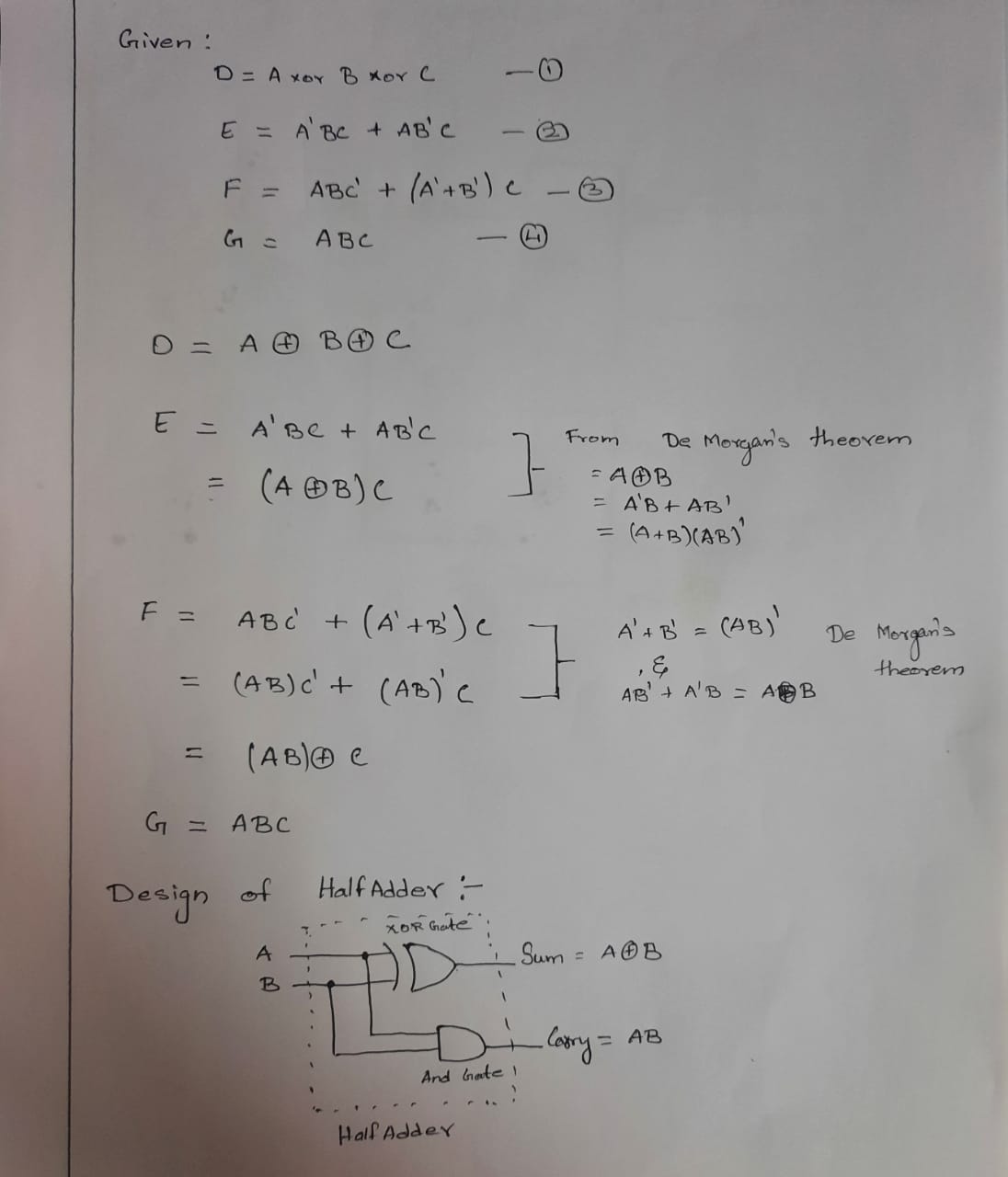
Implement the four Boolean functions listed using three half-adder circuits.

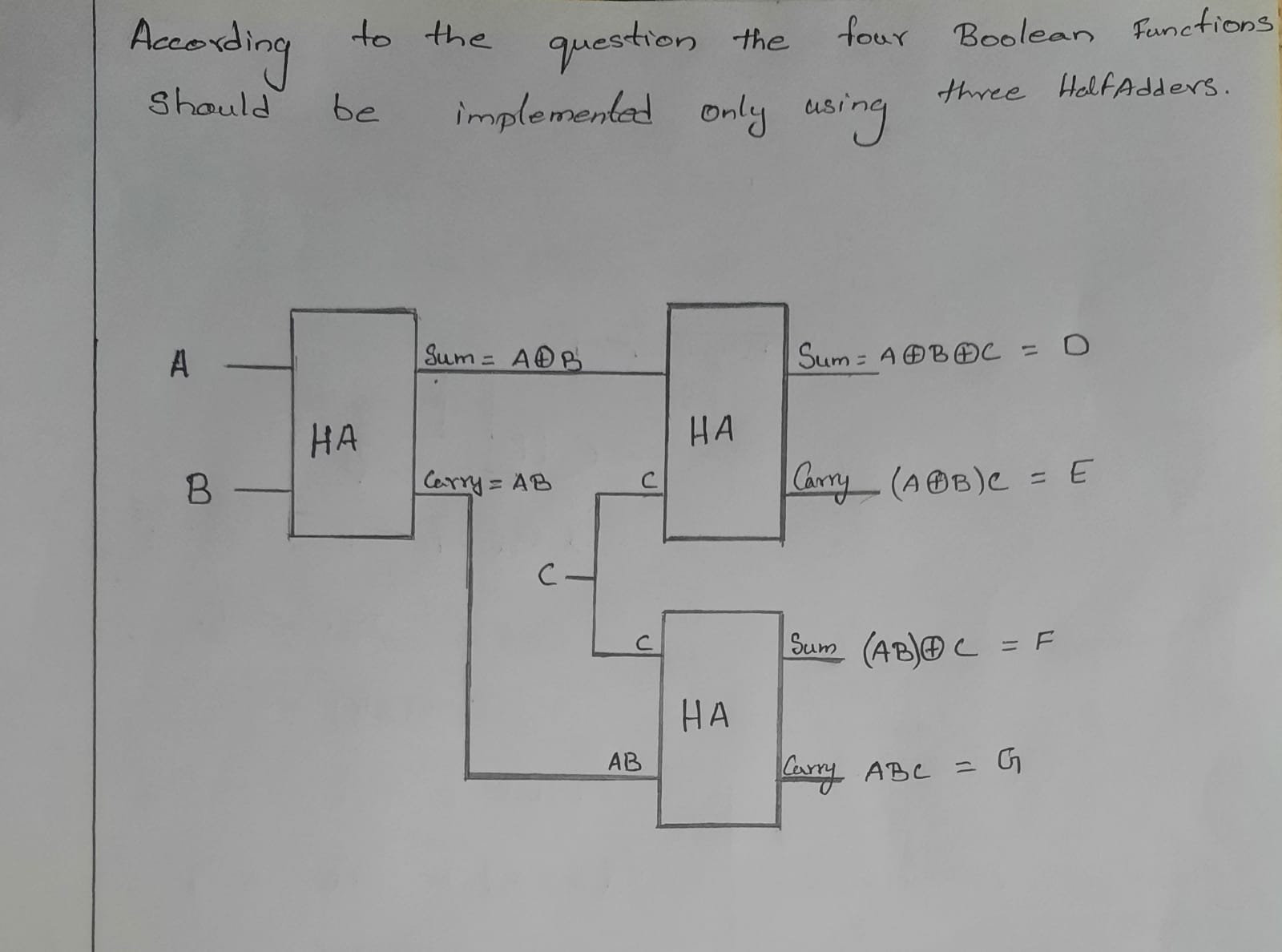
D = A xor B xor C

E = A'BC+ AB'C

F = ABC' + (A'+B') C

G = ABC





**Truth Table**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| a | b | c | d | e | f | g |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 0 | 0 | 1 | 1 | 0 | 1 | 0 |

**CODE:**

CHIP ThreeHalfAdders{

IN a, b, c;

OUT sum,

carry;

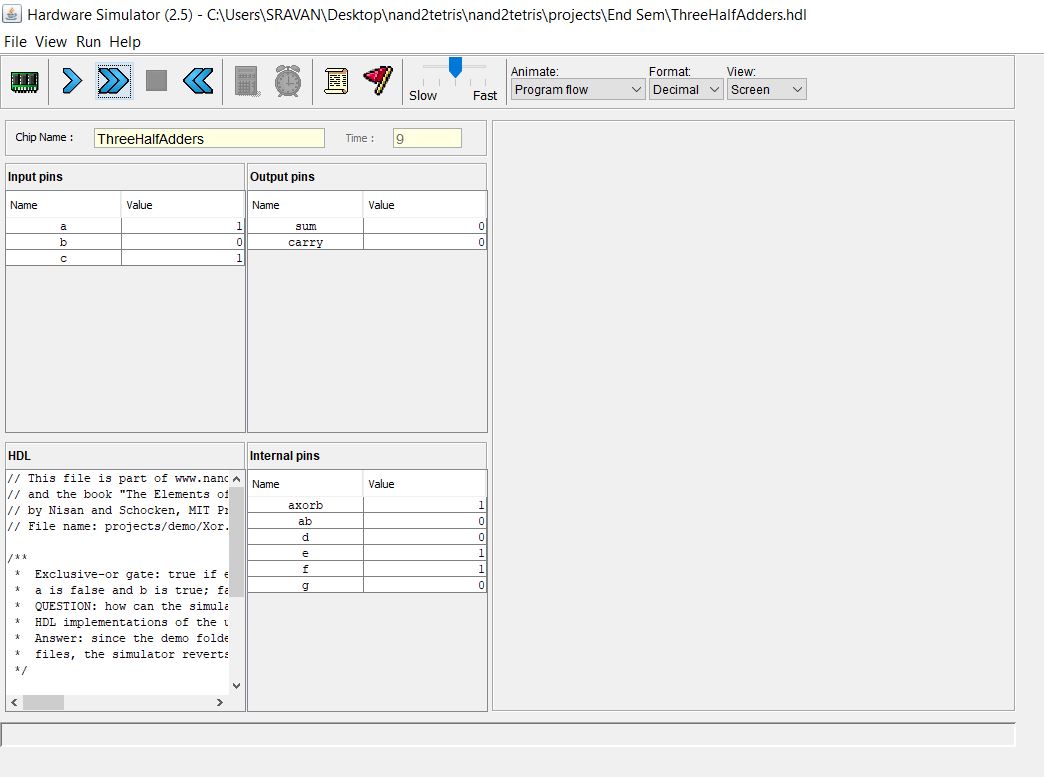
PARTS:

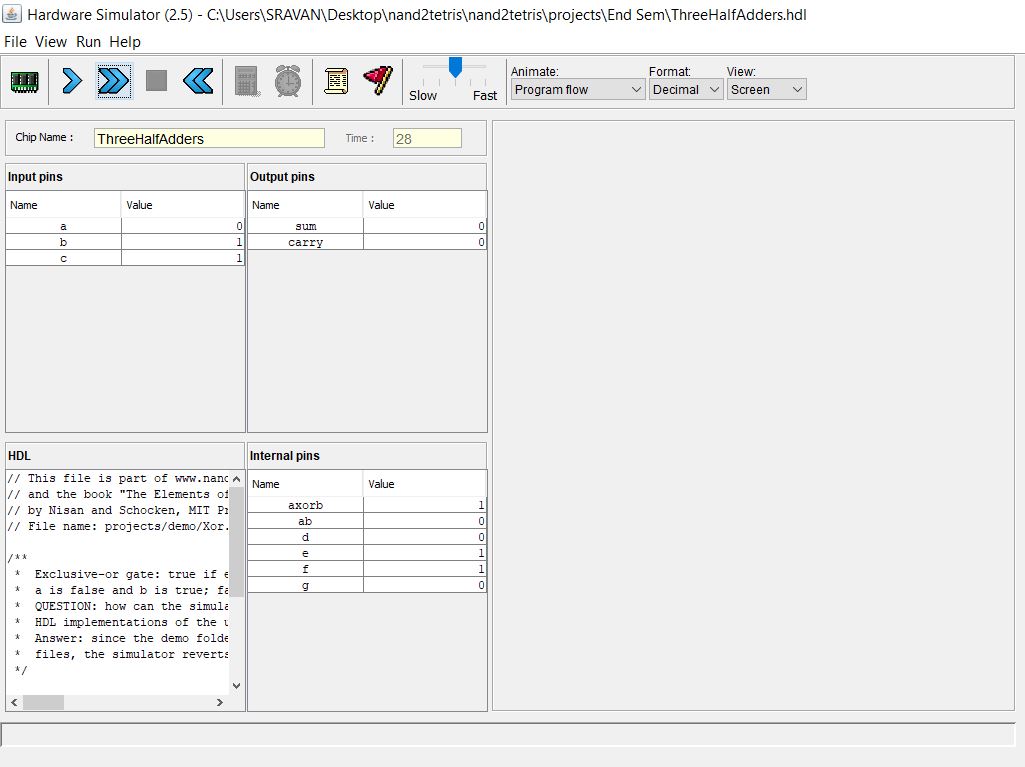
HalfAdder(a=a, b=b, sum=axorb, carry=ab);

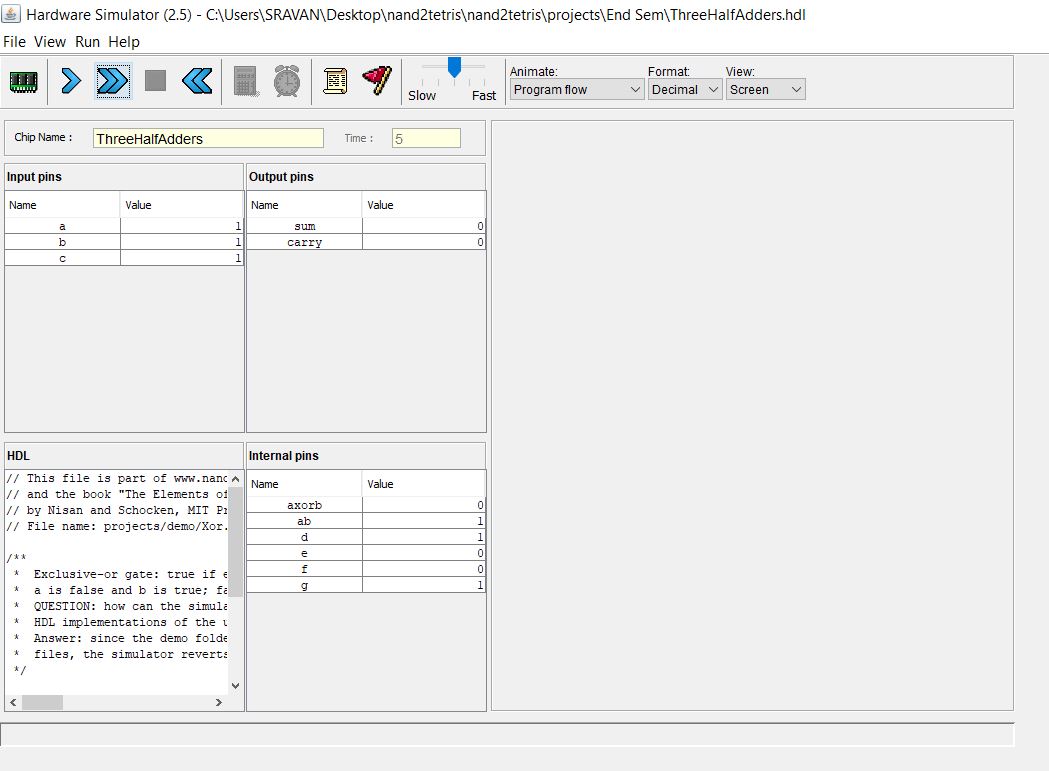
HalfAdder(a=axorb, b=c, sum=d, carry=e);

HalfAdder(a=c, b=ab, sum=f, carry=g);

}

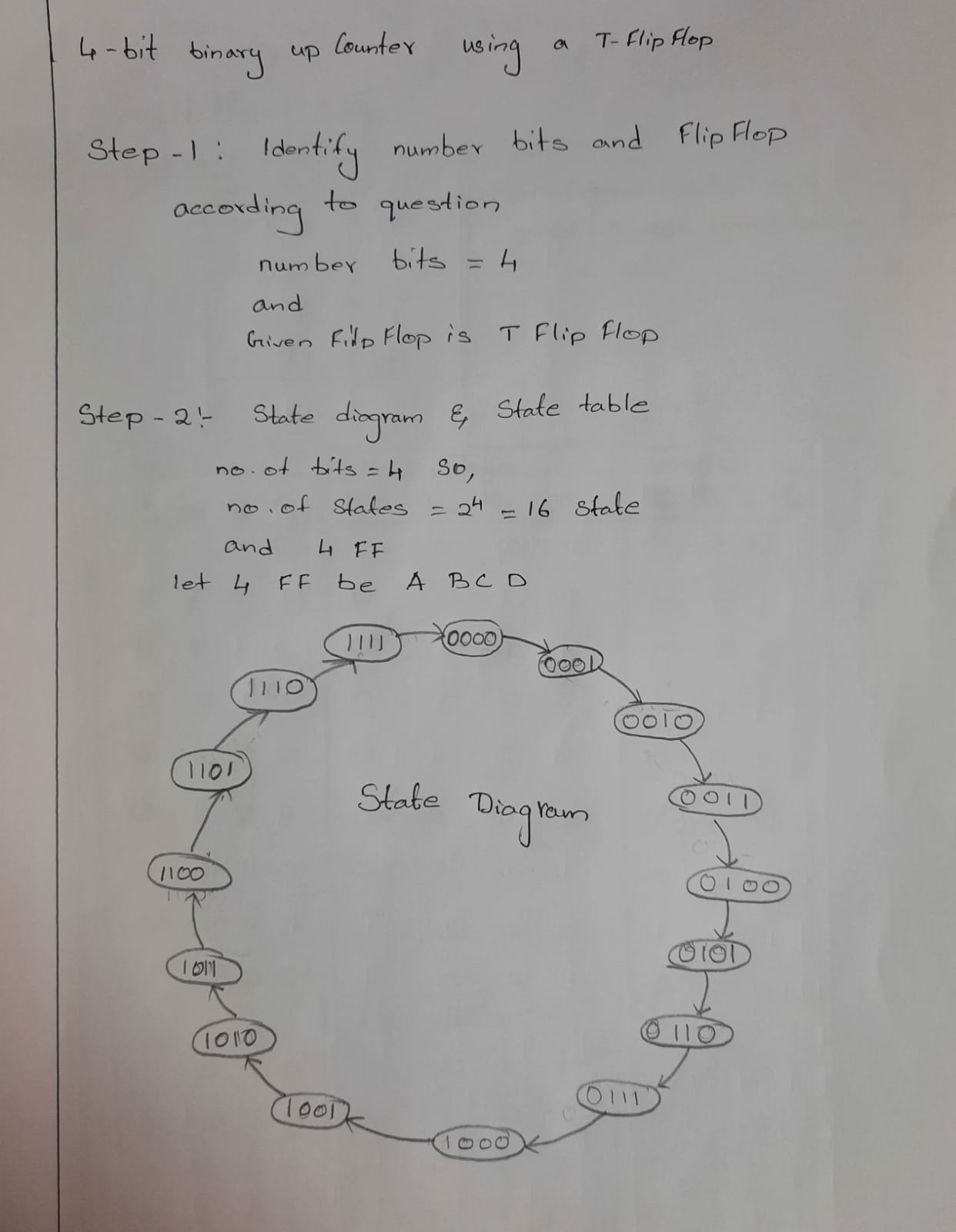


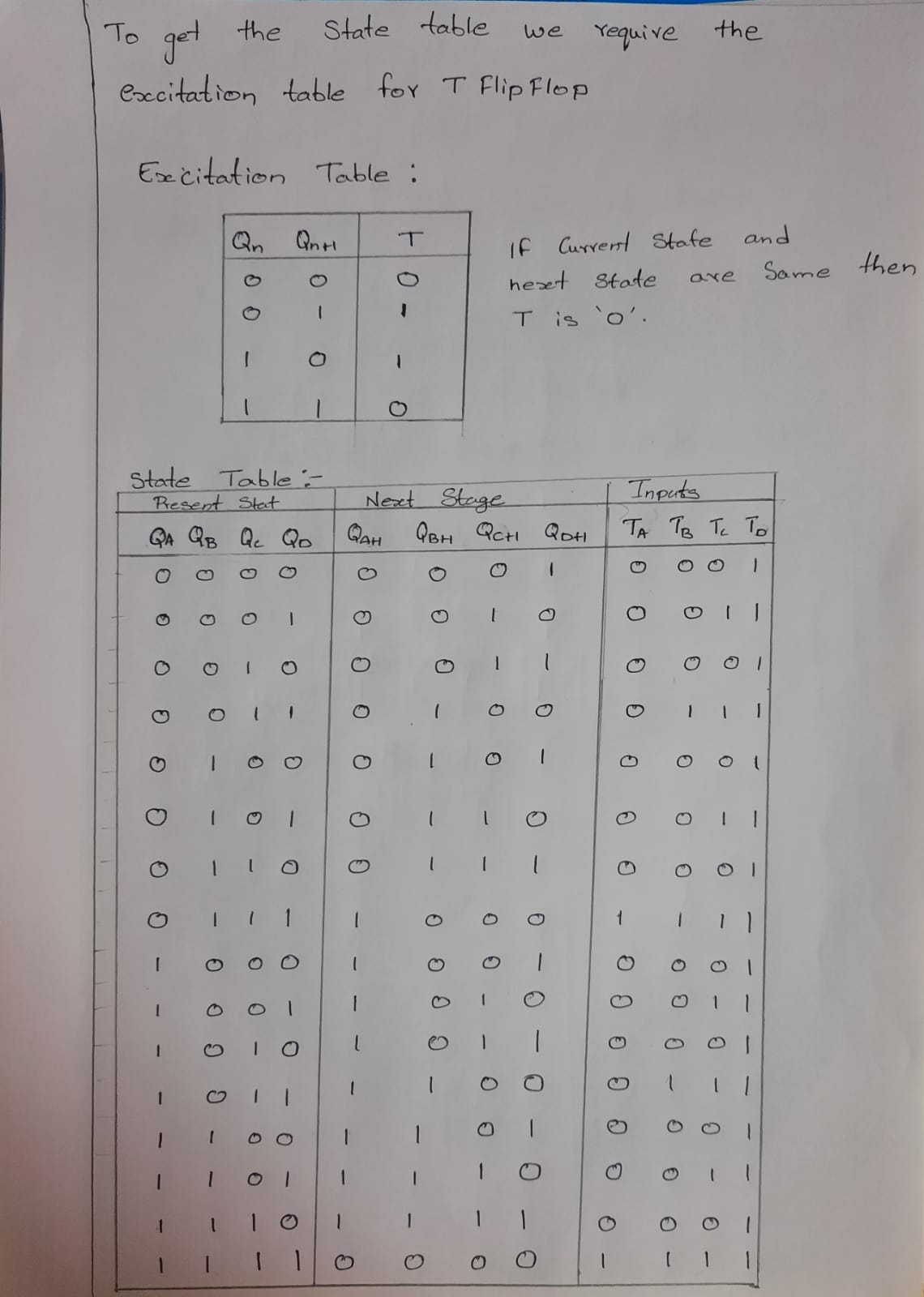


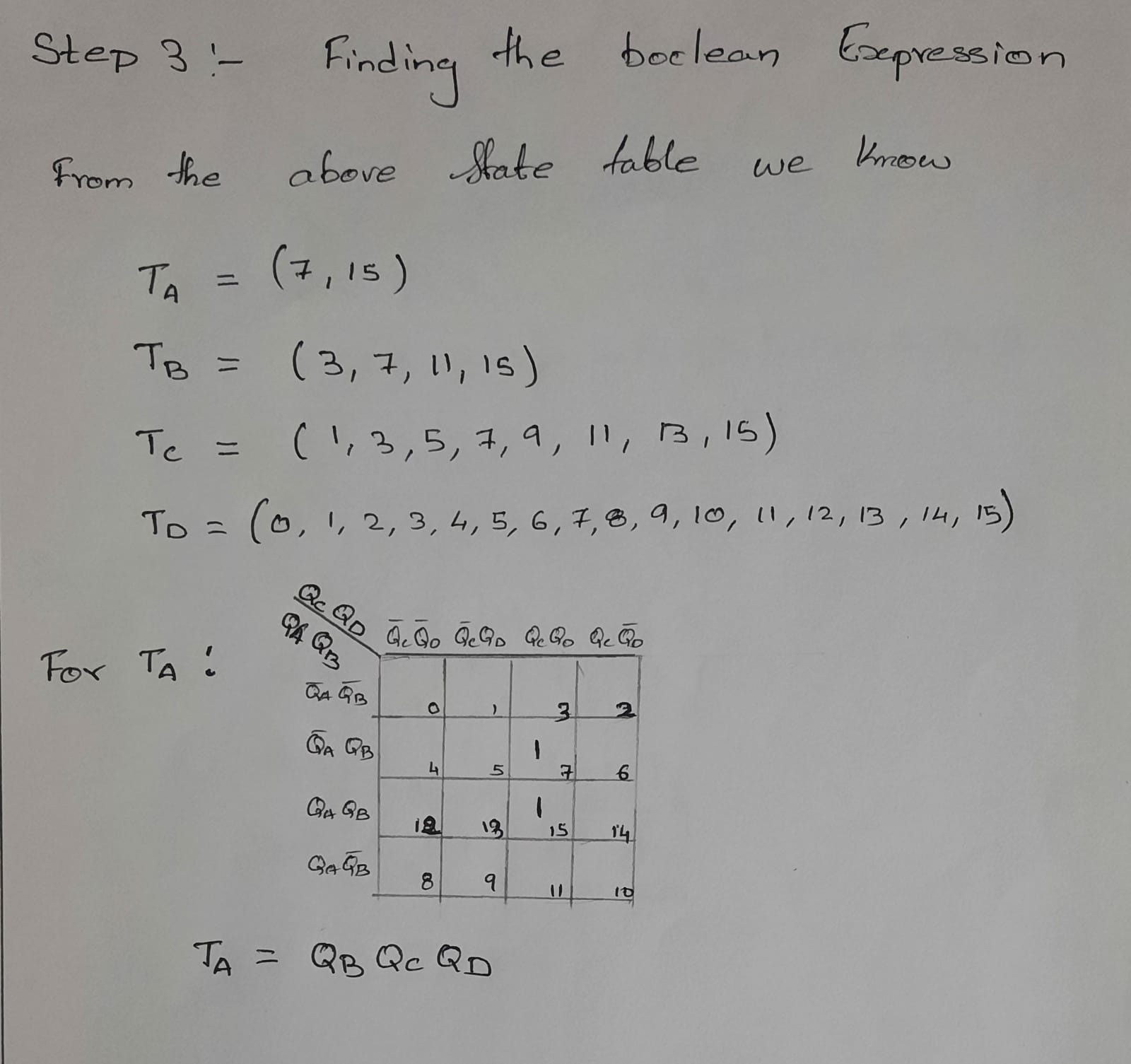


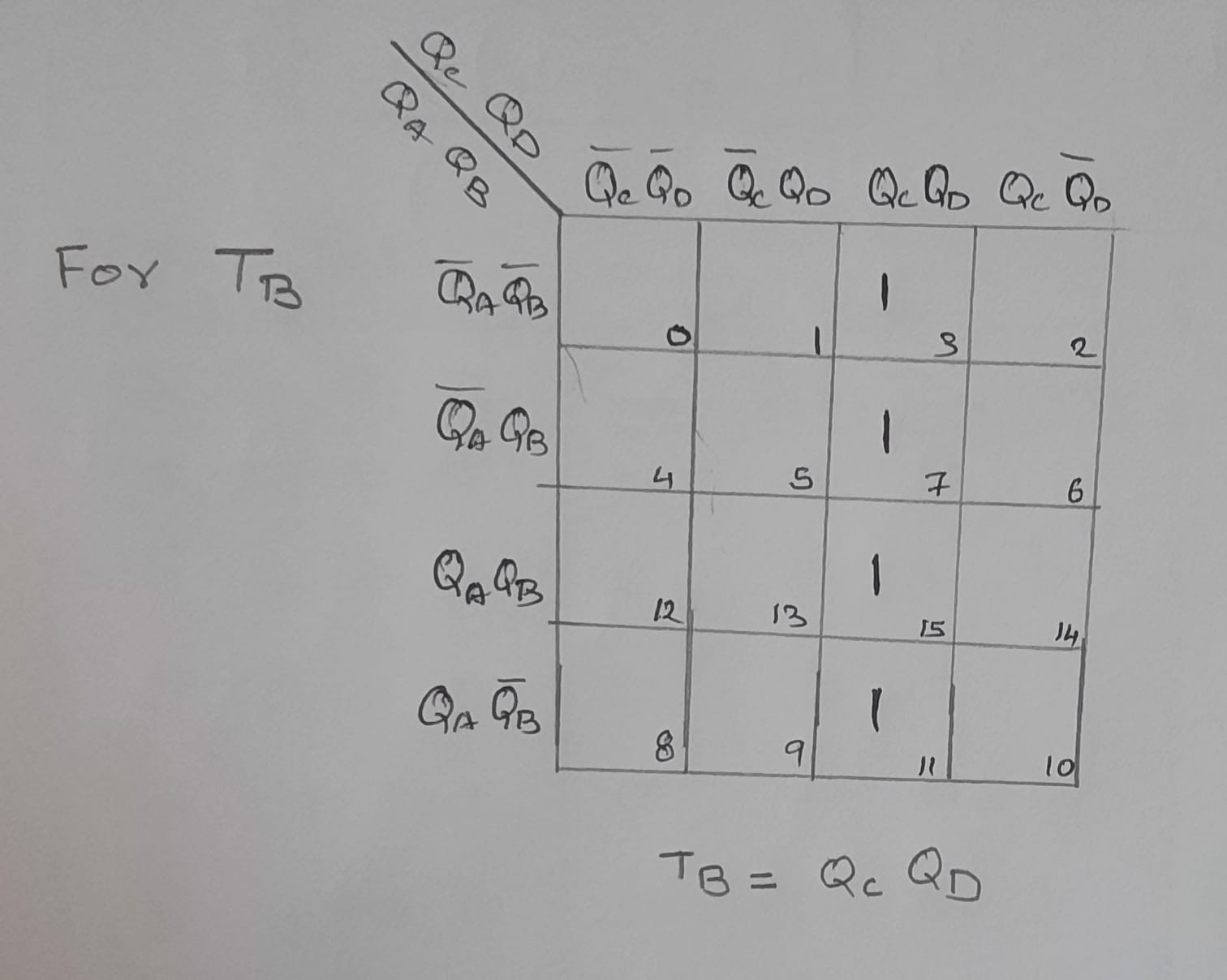
**Question-2**

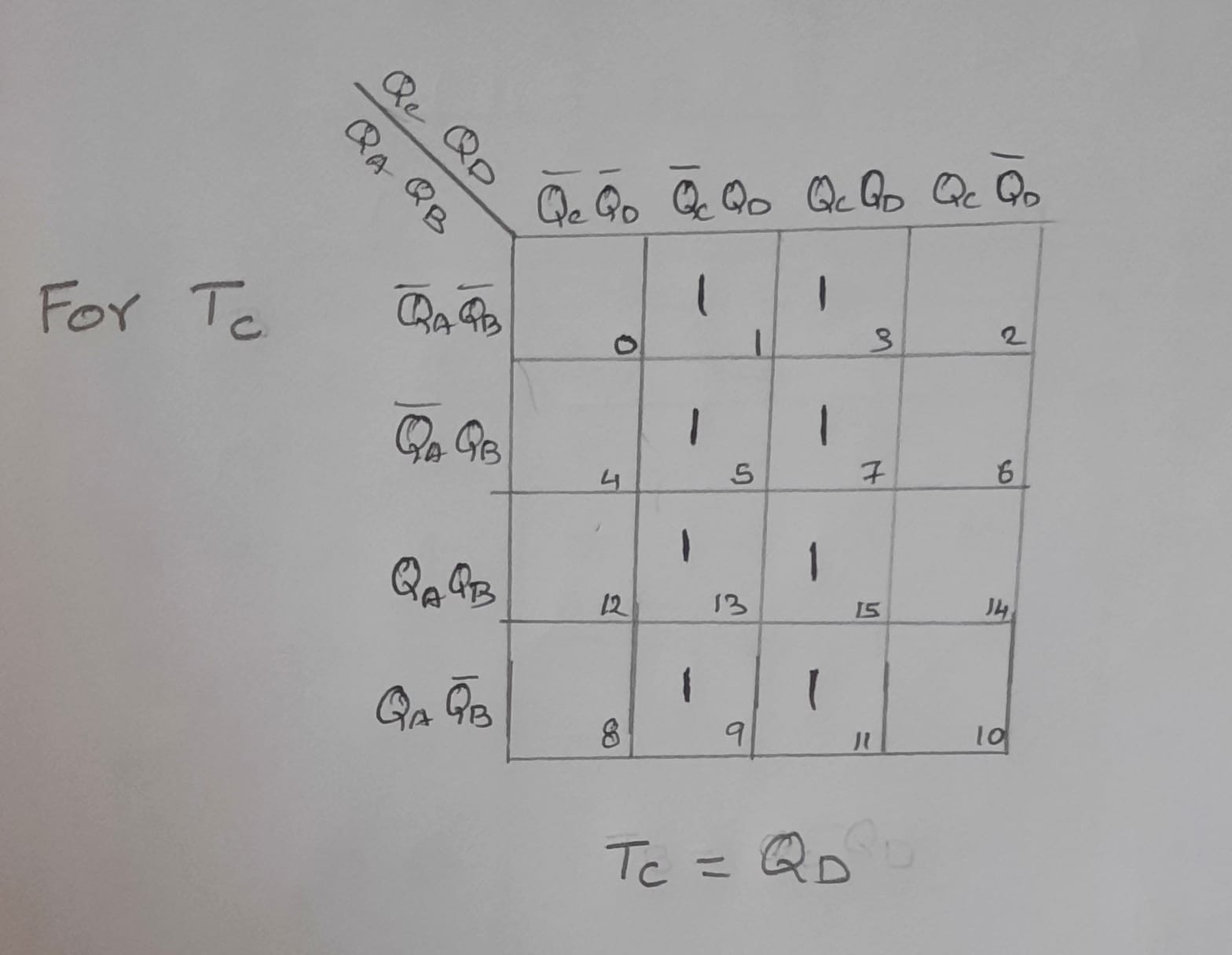
Explain the 4-bit binary up counter. Implement it using T Flip Flop.

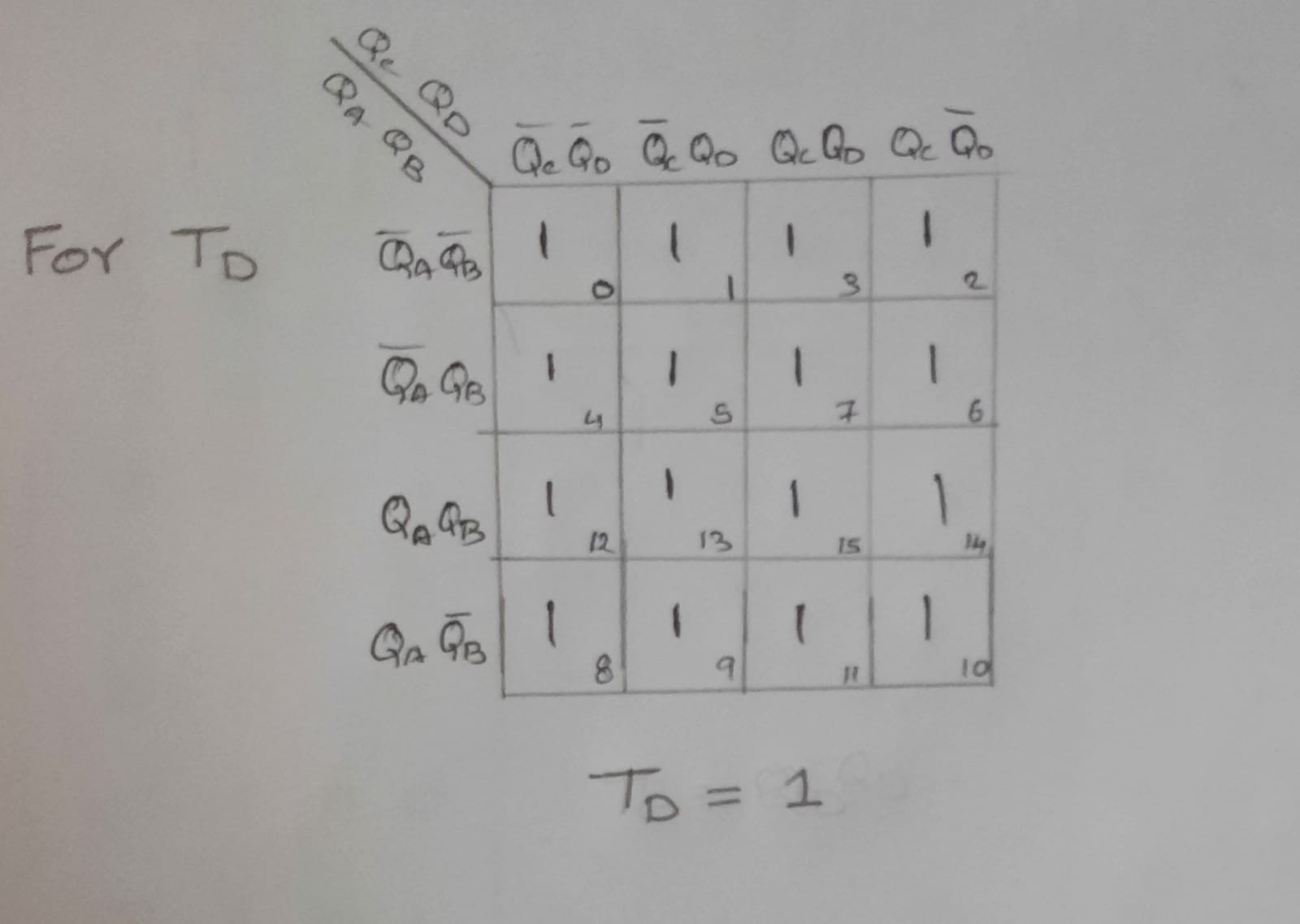


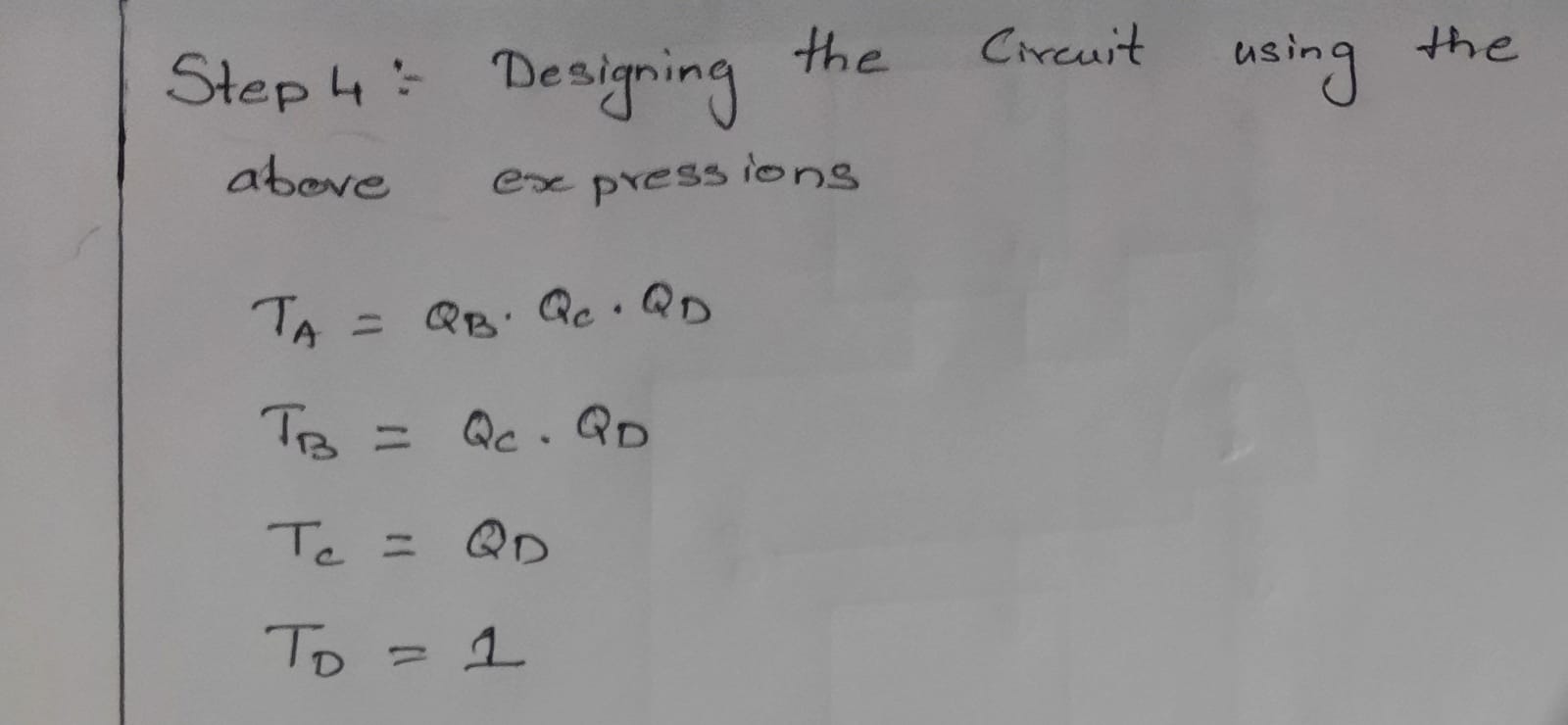


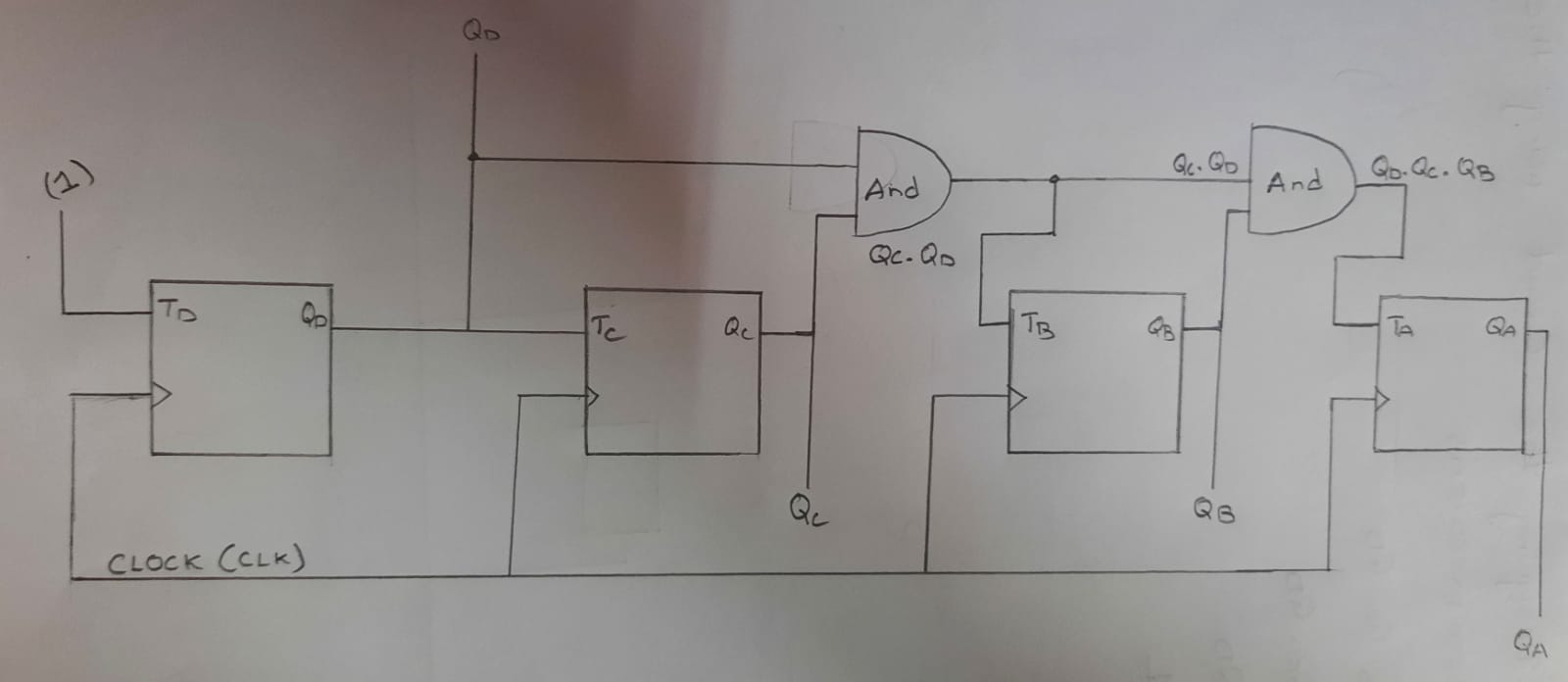












Truth Table

|  |  |  |
| --- | --- | --- |
| T | Qn | Qn+1 |
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

