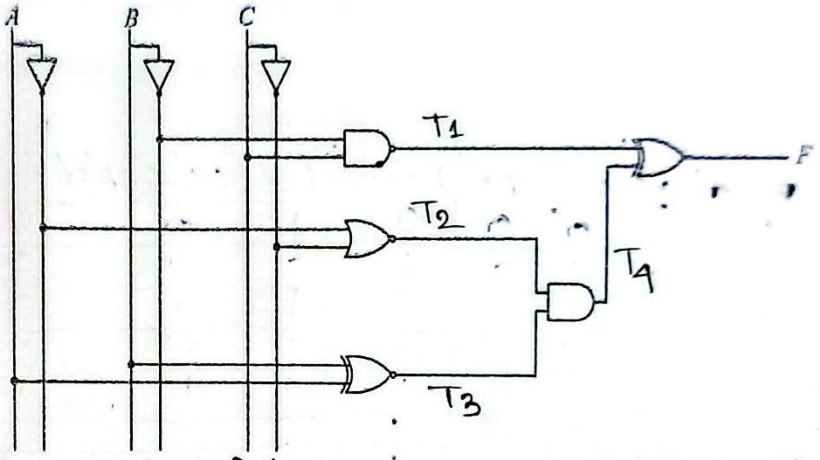
1. **Construct** the truth table for the following function (Do not change the form of the given expression). [CO1, Mark: 5]

$$F(A, B, C, D) = BC' + (AC' + B)A'D'$$

ABCD	A′	B′	C′	D′	BC′	AC′	(AC′+B)	A′D′	(AC′+B)A′D′	F
0000	1	1	1	1	0	0	0	1	0	0
0001	1	1	1	0	0	0	0	0	0	0
0010	1	1	0	1	0	0	0	1	0	0
0011	1	1	0	0	0	0	0	0	0	0
0100	1	0	1	1	1	0	1	1	1	1
0101	1	0	1	0	1	0	1	0	0	1
0110	1	0	0	1	0	0	1	1	1	1
0111	1	0	0	0	0	0	1	0	0	0
1000	0	1	1	1	0	1	1	0	0	0
1001	0	1	1	0	0	1	1	0	0	0
1010	0	1	0	1	0	0	0	0	0	0
1011	0	1	0	0	0	0	0	0	0	0
1100	0	0	1	1	1	1	1	0	0	1
1101	0	0	1	0	1	1	1	0	0	1
1110	0	0	0	1	0	0	1	0	0	0
1111	0	0	0	0	0	0	1	0	0	0

2. Analyze the following circuit by writing the Truth Table of the output. [CO2, Mark: 5]



$T_1 = (B' \cdot C)'$, $T_2 = (A + C')'$, $T_3 = A \otimes B$, $T_4 = T_2 \cdot T_3$, $F = T_1 \oplus T_4$

ABC	A'	B'	C'	T_1	T_2	T_3	T_4	F
000	1	1	1	1	0	1	0	1
001	1	1	0	0	0	1	0	0
010	1	0	1	1	0	0	0	1
011	1	0	0	1	0	0	0	1
100	0	1	1	1	0	0	0	1
101	0	1	0	0	1	0	0	0
110	0	0	1	1	0	1	0	1
111	0	0	0	1	1	1	1	0