

1. Construct the truth table for the following function (Do not change the form of the given expression). [8]

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

0-1
0001
0011
0101
0111

-10-
0100
0101
1100
1101

---1
0001
0011
0101
0111
1001
1011
1101
1111

0-0-
0000
0001
0100
0101

-0-
0000
0001
0010
0011
0100
0101
0110
0111

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

2. Determine the complement of the following expression (Do not change the form of the given expression). [2]

$$F(A, B, C, D) = \{C'(A' + D)\} + \{AC' + B'\}$$

$$F' = [\{C'(A' + D)\} + \{AC' + B'\}]'$$

$$= \{C'(A' + D)\}' \cdot (AC' + B')'$$

$$= \{C + (A' + D)'\} \cdot \{(AC')' \cdot (B')'\}$$

$$F' = (C + AD') \cdot \{(A' + C) \cdot B\}$$