1.

A	B	C	D	F
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
1	0	1	1	0
1	1	0	0	1
1	1	0	1	0
1	1	1	0	0
1	1	1	1	1

$$F = \bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}\bar{B}CD + \bar{A}B\bar{C}D + \bar{A}BC\bar{D}$$
$$\quad + A\bar{B}\bar{C}D + A\bar{B}C\bar{D} + AB\bar{C}\bar{D} + ABCD$$

$$= \bar{A}\cdot\bar{B}\bar{C}\bar{D} + \bar{A}\cdot\bar{B}CD + \bar{A}\cdot B\bar{C}D + \bar{A}\cdot BC\bar{D}$$
$$\quad + A\cdot\bar{B}\bar{C}D + A\cdot\bar{B}C\bar{D} + A\cdot B\bar{C}\bar{D} + A\cdot BCD$$

$$= \bar{A}\cdot D_0 + \bar{A}\cdot D_3 + \bar{A}\cdot D_5 + \bar{A}\cdot D_6 + A\cdot D_1 + A\cdot D_2$$
$$\quad + A\cdot D_4 + A\cdot D_7$$