Digital Logic Design
Quiz 03
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1. Express the following function as a sum of minterms and as a product of maxterms: (40%) (※用 Σ 和Π表示)

   (a) F(A, B, C) = C'(A+B) + A'B'C

   (b) F(A, B, C, D) = A'B + B'C'D' + CD'

(a) F(A, B, C) = Σ(1, 2, 4, 6) = Π(0, 3, 5, 7)

A \ BC	00	01	11	10
0	0	1	0	1
1	1	0	0	1

(b) F(A, B, C, D) = Σ(0, 2, 4, 5, 6, 7, 8, 10, 14)
= Π(1, 3, 9, 11, 12, 13, 15)

AB \ CD	00	01	11	10
00	1	0	0	1
01	1	1	1	1
11	0	0	0	1
10	1	0	0	1

2. Simplify the following Boolean functions, using k-maps: (60%)
   (a) F(x, y, z) = Σ(0, 2, 3, 4, 5, 7)
   (b) F(x, y, z) = Σ(0, 2, 4, 6)
   (c) F(w, x, y, z) = Π (0, 4, 6, 7, 8, 9, 12, 13, 14)

(a) F(x, y, z) = x'z' + yz + xy' or y'z' + xz + x'y

x \ yz	00	01	11	10
0	1	0	1	1
1	1	1	1	0

OR

x \ yz	00	01	11	10
0	1	0	1	1
1	1	1	1	0

(b) F(x, y, z) = z’

x \ yz	00	01	11	10
0	1	0	0	1
1	1	0	0	1

(c) F(w, x, y, z) = x’y + wyz + w’y’z

wx \ yz	00	01	11	10
00	0	1	1	1
01	0	1	0	0
11	0	0	1	0
10	0	0	1	1