**Rolling :**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| 1 |  |  | 1 |
| 1 |  |  | 1 |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 |  |  | 1 |
|  |  |  |  |

**Summary of k-map method :**

 1-Implement the T.T. to k-map

 2-Encircle the octet , quads and pairs . Remember to roll and overlap to get the largest possible group.

 3- If any isolated 1’s , encircle each .

 4-Write the Boolean exp. By ORing the products corresponding to the encircle groups.

***EX***: simplify the following function using k-map

 F(A,B,C) = ∑ (0,1,2,3,5)

00 01 11 10

BC

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | 1 | 101 |
|  |  | 1 |  |

G1

A

G2

 F = G1 + G2

 = A + BC

***EX***: Simplify the following function using k-map

 F (ABC) = ∑ m0 , m1 , m4 , m5

BC

00 01 11 10

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | 1 | 101 |
|  |  | 1 | 1  |

A

G1

 F = G1

 = B

***EX***: Simplify the following function using k-map :

 F (ABCD) = ∑ (0,2,3,4,6,10,12,13,14)

AB

CD

00 01 11 10

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 |  | 1 |
| 1 |  |  | 1 |
| 1 |  | 1 | 1 |
| 1 |  |  |  |

00

G4

G3

01

11

G1

G4

10

G2

 F = G1 + G2 + G3 + G4

***EX***: Find the simplified output in PS method using k-map for the following function :

 F = (ABC) = π (0,1,4,6)

00 01 11 10

BC

A

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | 0 | 0 |
| 0G2 |  |  | 0  |

01

G1

G2

 F = G1.G2

 = (A+B) (A+C)

***EX***: Simplify the following using k-map :

 F (ABCD) = π(0,1,2,3,5,7,8,9,10,11)

G2

AB

CD

00 01 11 10

|  |  |  |  |
| --- | --- | --- | --- |
| 0 | 0 | 0 | 0 |
|  | 0 | 0 |  |
|  |  |  |  |
| 0G1 | 0 | 0 | 0 |

G1

00

01

11

10

 F = G1 . G2

 = B(A+D)

**Don’t care condition :**

 Some logic ccts. can be designed so that there are certain input conditions for which there are no specified output levels , because these input conditions will never occur.

 It is necessary to specify the output for these conditions by either (0) or (1) in order to produce the simplest output exp.