

1) find no: of prime implicants, essential prime implicants, minimal expression of function

AB \ CD

	00	01	11	10
00	1		1	1
01	1			
11				1
10	1	1		1

Sol

AB \ CD

	00	01	11	10
00	1		1	1
01	1			
11				1
10	1	1		1

✓ → Essential prime

4 → EPI.

5 → PI.

$$\bar{A}\bar{C}\bar{D} + \bar{A}\bar{B}C + A\bar{B}\bar{C} + A\bar{C}\bar{D}$$

2) The minimal expression of function
 $f(A, B, C, D) = \sum m(0, 1, 3, 4, 5, 7, 8, 9, 11)$

Sol

AB \ CD

	00	01	11	10
00	1	1	1	
01	1	1	1	
11				
10	1	1	1	

$$\bar{A}\bar{C} + \bar{A}D + \bar{B}\bar{C} + \bar{B}D$$

$$(\bar{A} + \bar{B})(\bar{C} + D)$$

3) Minimal expression of $f(A, B, C, D) = \sum m(1, 14, 15) + d \sum (0, 5, 10, 12)$

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

AC

4) Minimal expression of $f(A, B, C) = \sum m(1, 4, 5, 6, 7)$

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

$$\bar{B}C + B\bar{C} + AC$$

$$(B \oplus C) + AC$$

2

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

$$\bar{B}C + B\bar{C} + AB$$

$$(B \oplus C) + AB$$