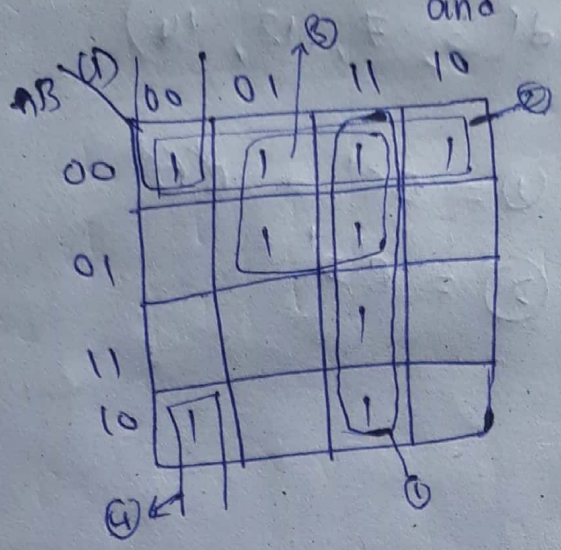
1) Simplify the boolean function

$F(A, B, C, D) = \Sigma m(0, 1, 2, 3, 5, 7, 8, 11, 15)$ and identify Essential Prime Implicants?



① = CD

② = $A'B'$

③ = $A'D$

④ = $B'C'D'$

$F(A, B, C, D) = ① + ② + ③ + ④$

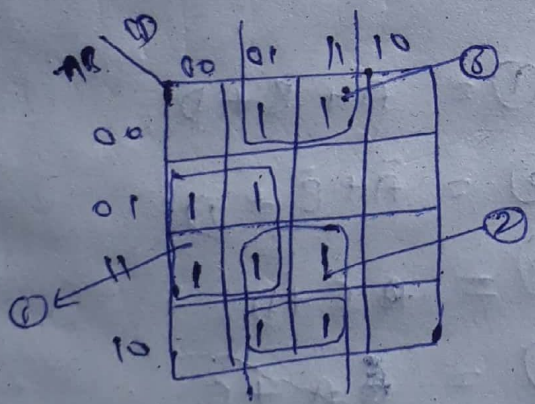
$= CD + A'B' + A'D + B'C'D'$

$= CD + A'D + B'C'D'$

EPI : ①, ③, ④

2) Simplify the boolean function

$F(A, B, C, D) = ABCD + ABC' + ACD + BC' + B'D + ABD$



① = BC'

② = AD

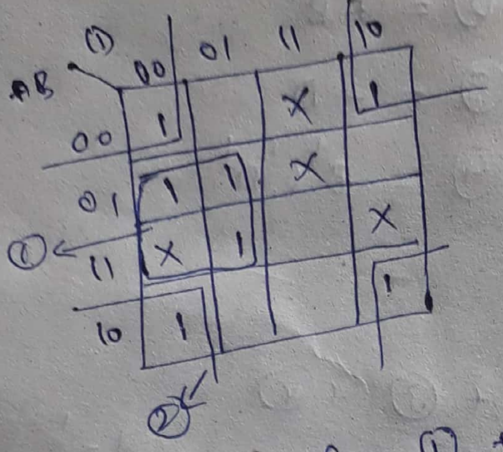
③ = $B'D$

So $F = ① + ② + ③$

$= BC' + AD + B'D$

3) Simplify

$F(A,B,C,D) = \Sigma m(0,2,4,5,8,10,13) + d(3,7,12,14)$



① = BC'

② = $B'D'$

$f = ① + ②$

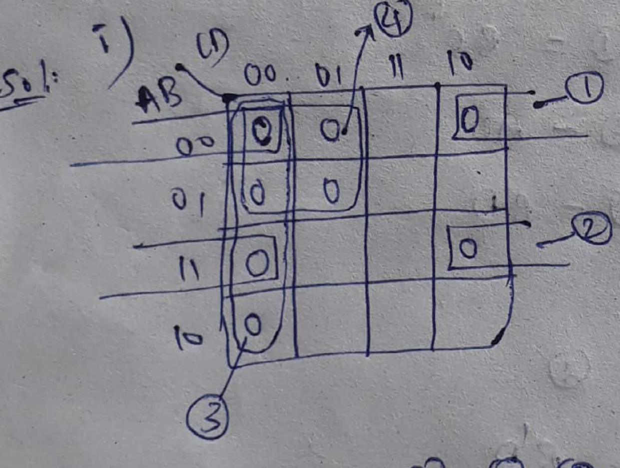
$= BC' + B'D'$

4) i) Simplify the boolean function

ii) What will be the minterms of the function.

$F(A,B,C,D) = \Pi M(0,1,2,4,5,8,12,14)$

Sol: i)



① = $A+B+D$

② = $\bar{A}+\bar{B}+D$

③ = $C+D$

④ = $A+C$

So $f = ① \cdot ② \cdot ③ \cdot ④$

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

ii) $F(A,B,C,D) = \Sigma m(3,6,7,9,10,11,13,15)$