SOP (Sum of product) , $AB+BC \Rightarrow$ SOP

POS (Product of sum) $(A+B)(B+C) \Rightarrow$ POS

SSOP → Each product term contains all the variables

SPOS → Each sum term contains all the variables

Minterm :

Each individual product term in SSOP form is called as Minterm.

Maxterm :

Each individual sum term in SPOS form is called as Maxterm.

Two variable function $f(A,B)$

Variable (2^n)		Minterm (SSOP) ($n\Sigma n$ = product)	Maxterm (SPOS) (sum → π_M)
A	B		
0	0	$\bar{A}\bar{B} \rightarrow (m_0)$	$A+B\ (M_0)$
0	1	$\bar{A}B \rightarrow (m_1)$	$A+\bar{B}\ (M_1)$
1	0	$A\bar{B} \rightarrow (m_2)$	$\bar{A}+B\ (M_2)$
1	1	$AB \rightarrow (m_3)$	$\bar{A}+\bar{B}\ (M_3)$

Find the minterm :

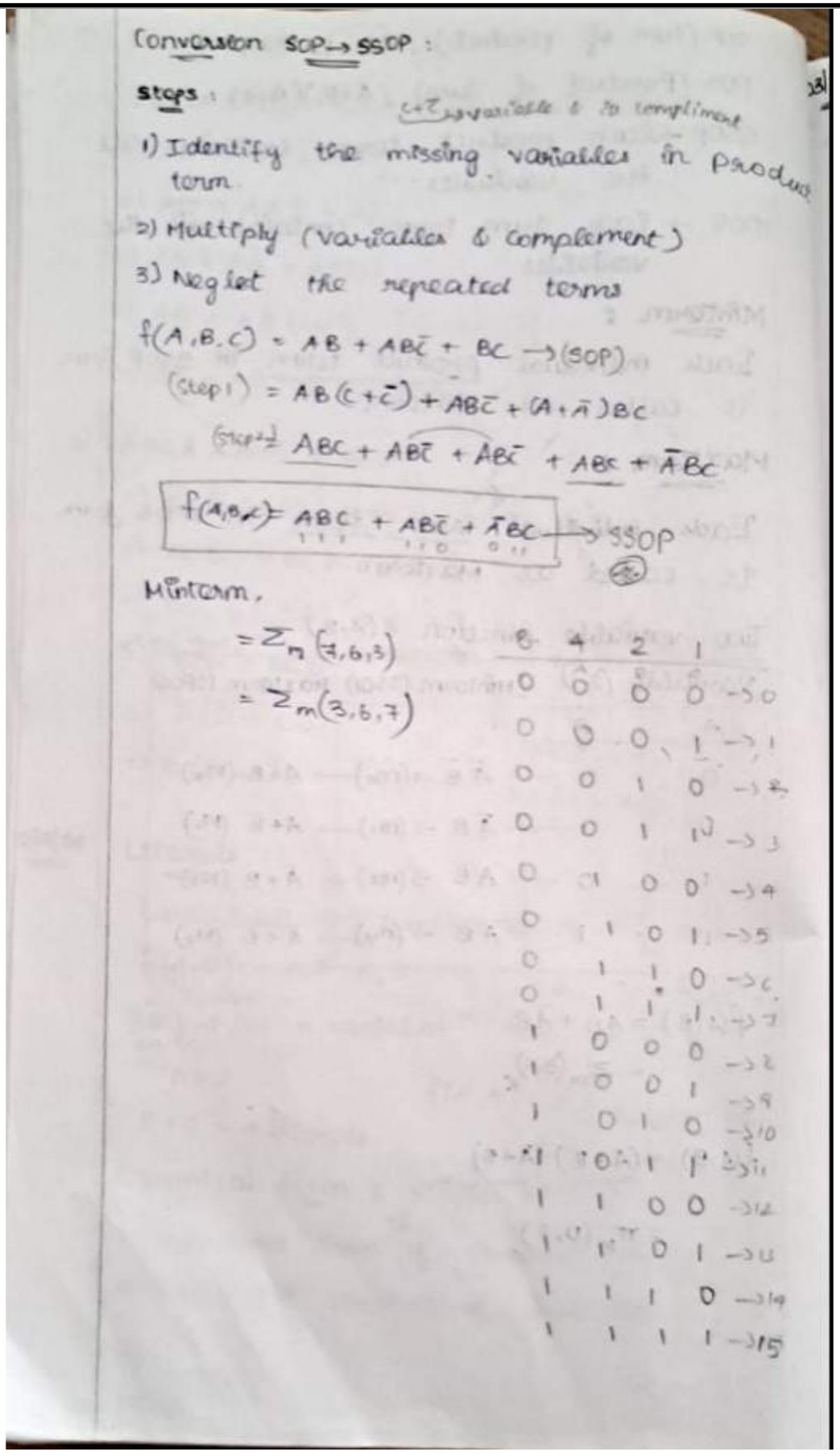
$$f(A,B) = AB + \bar{A}B \quad (m_3, m_1)$$

$$= \Sigma_m(3,1)$$

Find maxterm :

$$f(A,B) = (A+B)(\bar{A}+B) \quad (M_0, M_2)$$

$$= \pi_M(0,2)$$



Conversion SOP → SSOP :

Steps :

1) Identify the missing variables in product term (i+i' variable i is compliment)
2) Multiply (variables & complement)
3) Neglect the repeated terms

$f(A,B,C) = AB + AB\bar{C} + BC \rightarrow (SOP)$

(step 1) $= AB(C+\bar{C}) + AB\bar{C} + (A+\bar{A})BC$

(step 2) $ABC + AB\bar{C} + AB\bar{C} + ABC + \bar{A}BC$

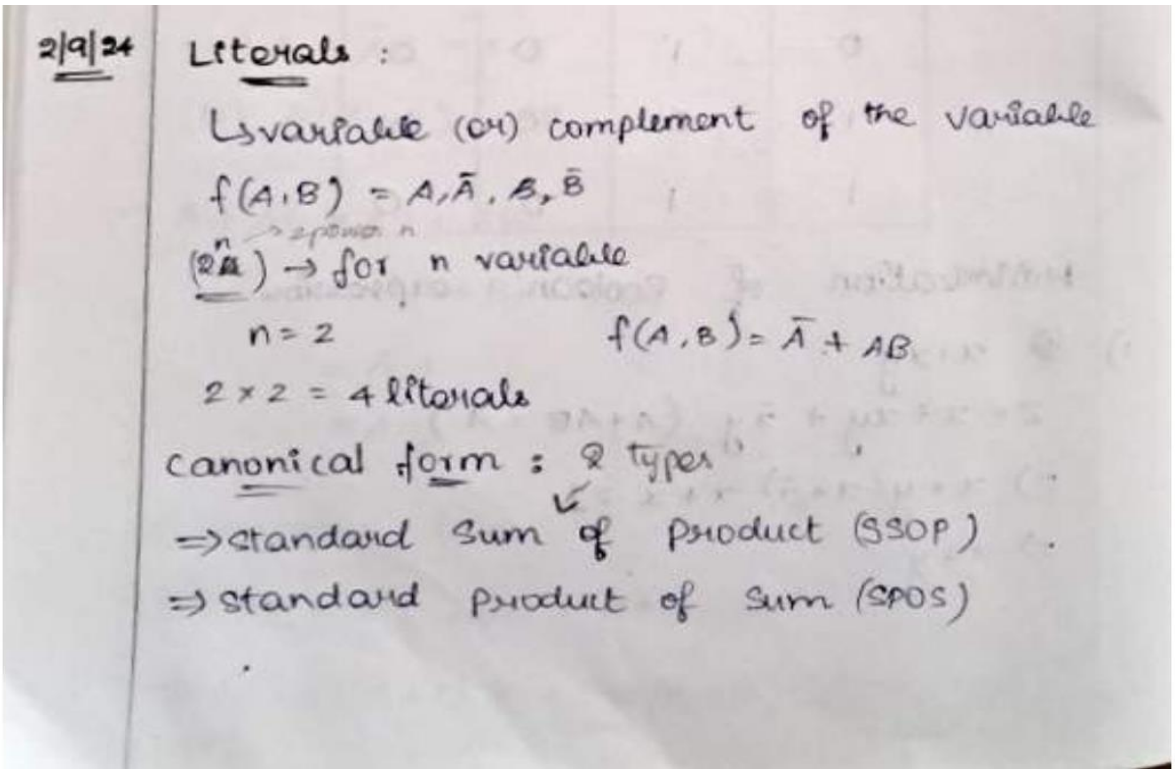
$f(A,B,C) = \underset{1\,1\,1}{ABC} + \underset{1\,1\,0}{AB\bar{C}} + \underset{0\,1\,1}{\bar{A}BC} \rightarrow$ SSOP

Minterm,

$= \Sigma_m(7,6,3)$

$= \Sigma_m(3,6,7)$

8	4	2	1	
0	0	0	0	→0
0	0	0	1	→1
0	0	1	0	→2
0	0	1	1	→3
0	1	0	0	→4
0	1	0	1	→5
0	1	1	0	→6
0	1	1	1	→7
1	0	0	0	→8
1	0	0	1	→9
1	0	1	0	→10
1	0	1	1	→11
1	1	0	0	→12
1	1	0	1	→13
1	1	1	0	→14
1	1	1	1	→15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Literals :
Lvariable (or) complement of the variable
f(A,B) = A, Ā, B, B̄
(2^n) → for n variable
n = 2
f(A,B) = Ā + AB
2 × 2 = 4 literals
canonical form : 2 types
⇒ standard sum of product (SSOP)
⇒ standard product of sum (SPOS)