
ZERO TO NIT
NIMCET
2027
COMPUTER AWARENESS
POS Simplification (K-Maps)
Lecture - 50
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Recap of previous lecture

1. SOP K - Maps Simplification

$$F = AB + \bar{A}B$$

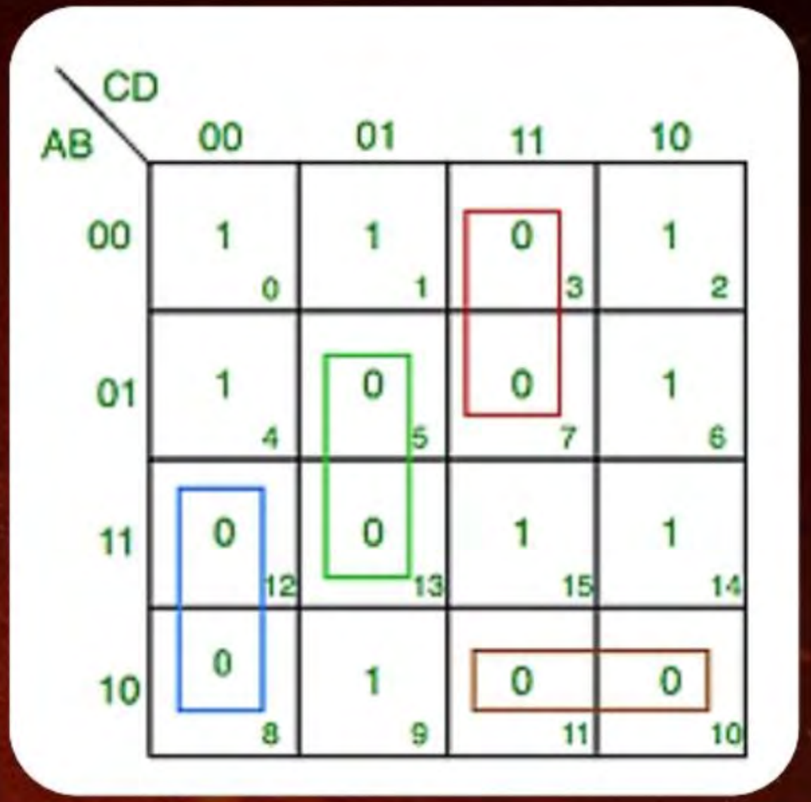
m m



Topics to be covered

1. POS K - Maps Simplification

$$F = (A+B)\cdot(\bar{A}+B)$$

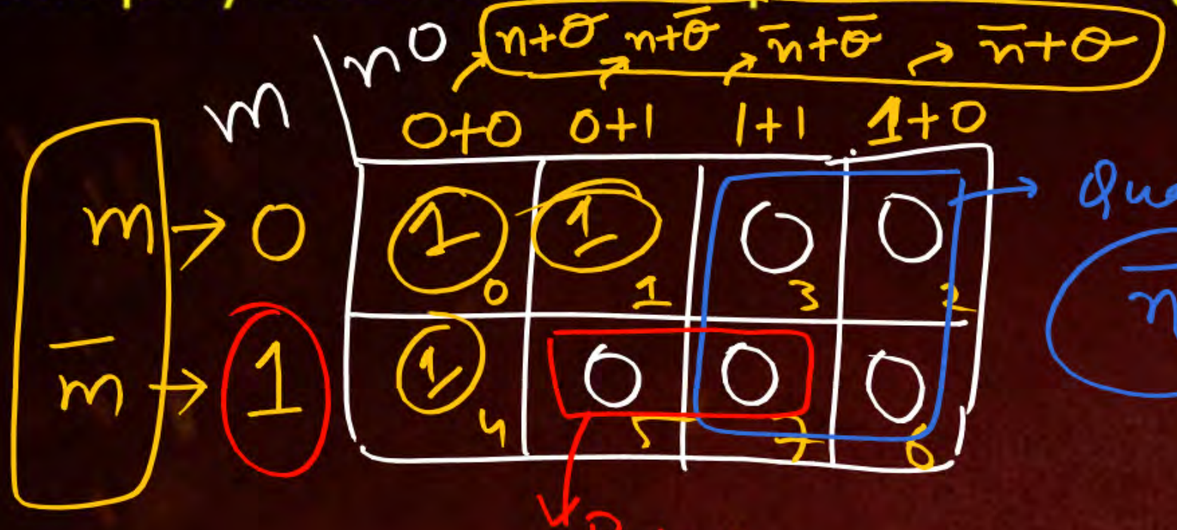


Question 1

Groups
- Octet (8)
- Quad (4)
- pair (2)

$\Sigma_m \Rightarrow$ SOP $\pi_M \Rightarrow$ POS

Simplify the boolean expression using K-Map : $F(m, n, o) = \pi_M(2, 3, 5, 6, 7)$.



Quad 1 → $\bar{n}$

Pair 1 → $(\bar{m}+\bar{o})$

Standard ☆

☆ ☆ ☆

Am

$F = \bar{n} \cdot (\bar{m}+\bar{o})$

Canonical Form

Convert → POS to SOP

Maxterm

$F(m,n,o) = \bar{n} \cdot (\bar{m} + \bar{o})$

$M_2 \cdot M_3 \cdot M_6 \cdot M_7 \cdot M_5$

$= (\bar{n} + m \cdot \bar{m} + o \cdot \bar{o}) \cdot (\bar{m} + \bar{o} + n \cdot \bar{n})$

$M_0 + M_1 + M_4$

$= (\bar{n} + m + o) \cdot (\bar{n} + m + \bar{o}) \cdot (\bar{n} + \bar{m} + o) \cdot (\bar{n} + \bar{m} + \bar{o}) \cdot (\bar{m} + \bar{o} + n) (\bar{m} + \bar{o} + \bar{n})$

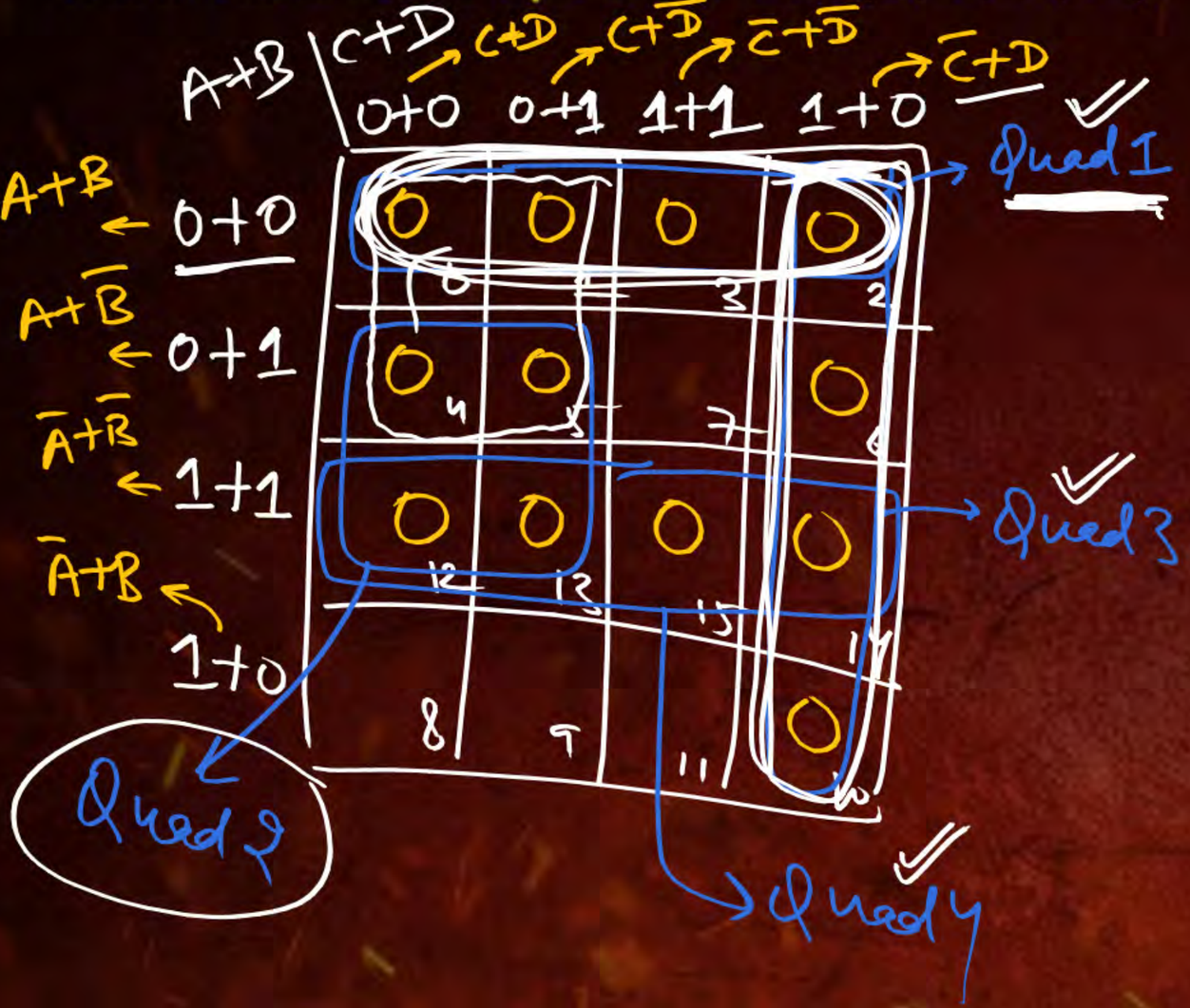
$\bar{m}\bar{n}\bar{o} + \bar{m}\bar{n}o + m\bar{n}\bar{o}$

$\Rightarrow (m + \bar{n} + o) \cdot (m + \bar{n} + \bar{o}) \cdot (\bar{m} + \bar{n} + o) \cdot (\bar{m} + \bar{n} + \bar{o}) \cdot (\bar{m} + n + \bar{o})$

Question 2

$\sum_m \Rightarrow A=1, \bar{A}=0$ $\quad \pi_M \Rightarrow A=0, \bar{A}=1$

Minimize the expression: $F(A, B, C, D) = \pi_M(0, 1, 2, 3, 4, 5, 6, 10, 12, 13, 14, 15)$.



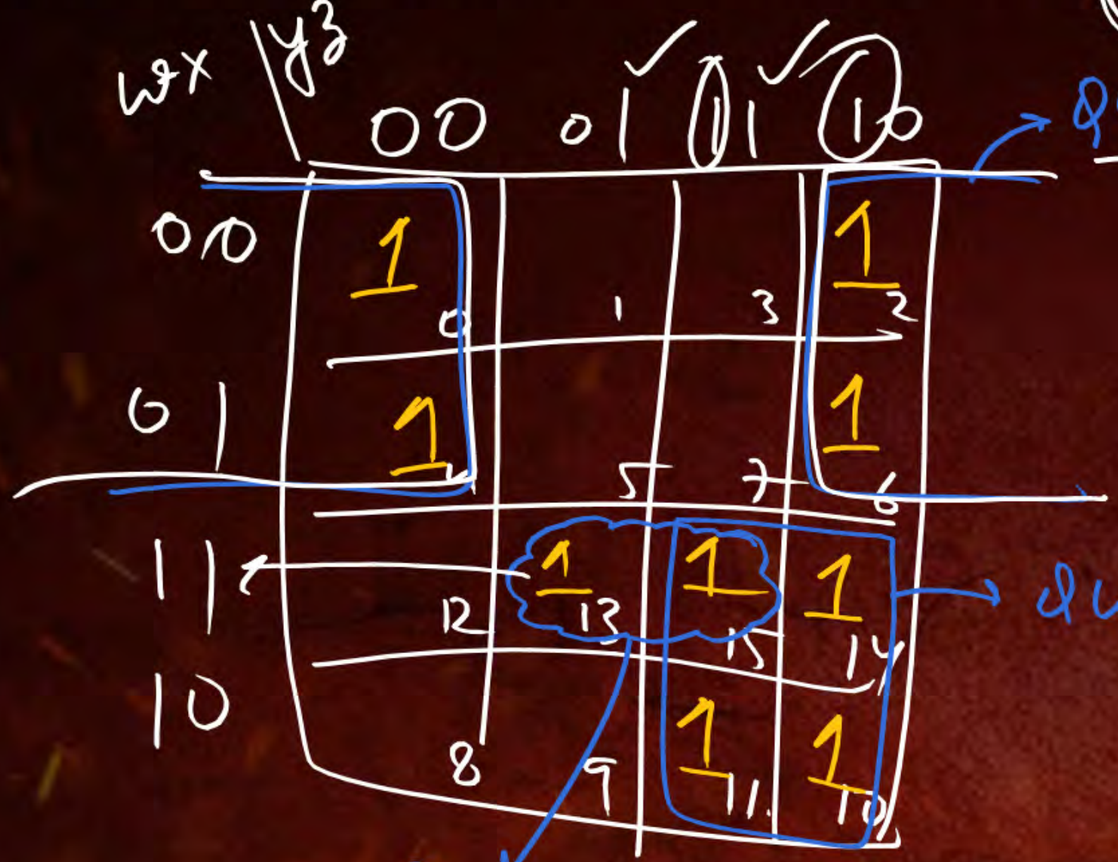
$F = (A+B).(\bar{B}+C).(\bar{A}+\bar{B}).(\bar{C}+D)$

OR

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

Question 3

Minimize the expression: $F(w, x, y, z) = \Sigma_m(0, 2, 4, 6, 10, 11, 13, 14, 15)$.



$F = \bar{w}\bar{z} + wy + wxz$

SOP

$\bar{A} = 0$

$A = 1$

POS

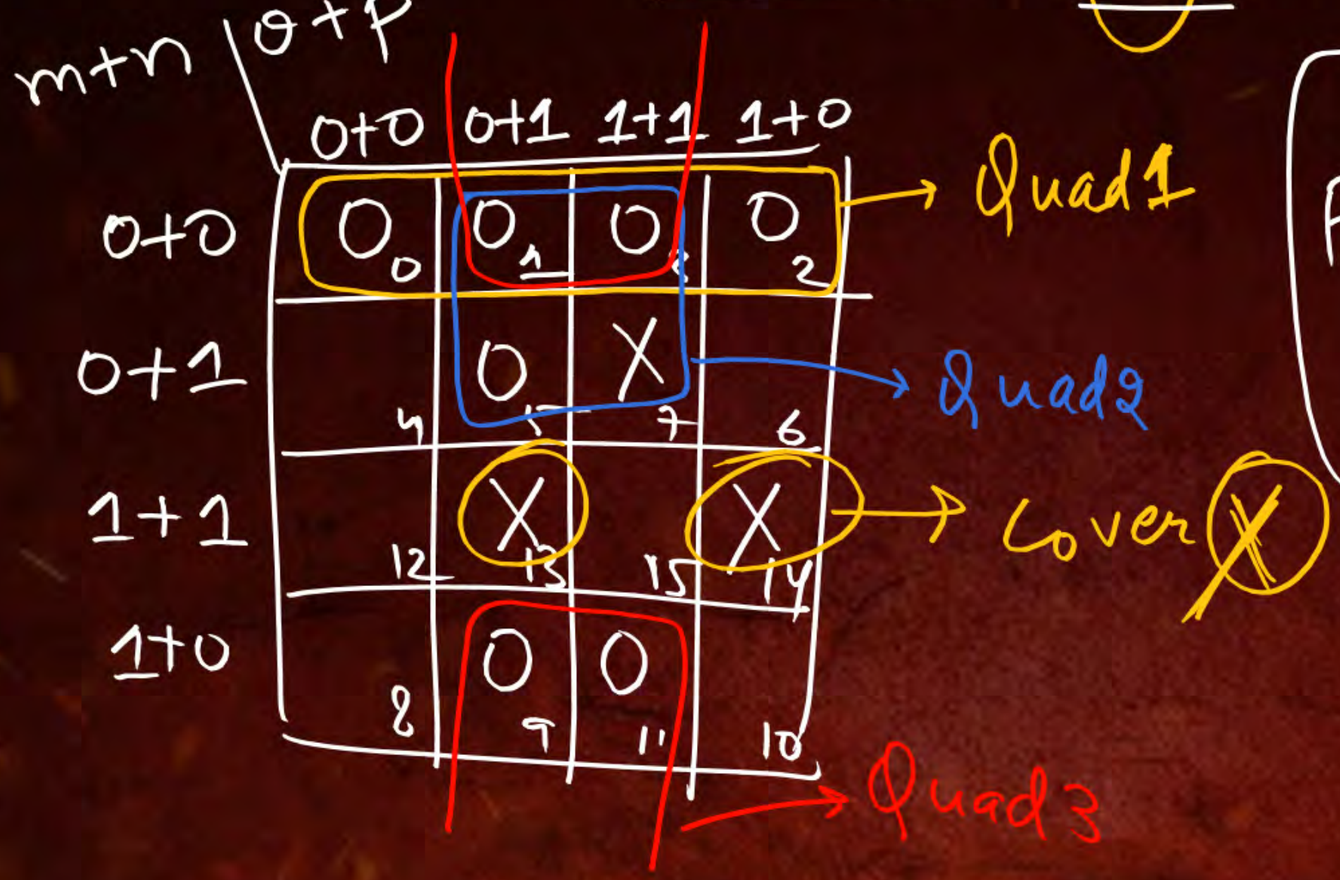
$A = 0$

$\bar{A} = 1$

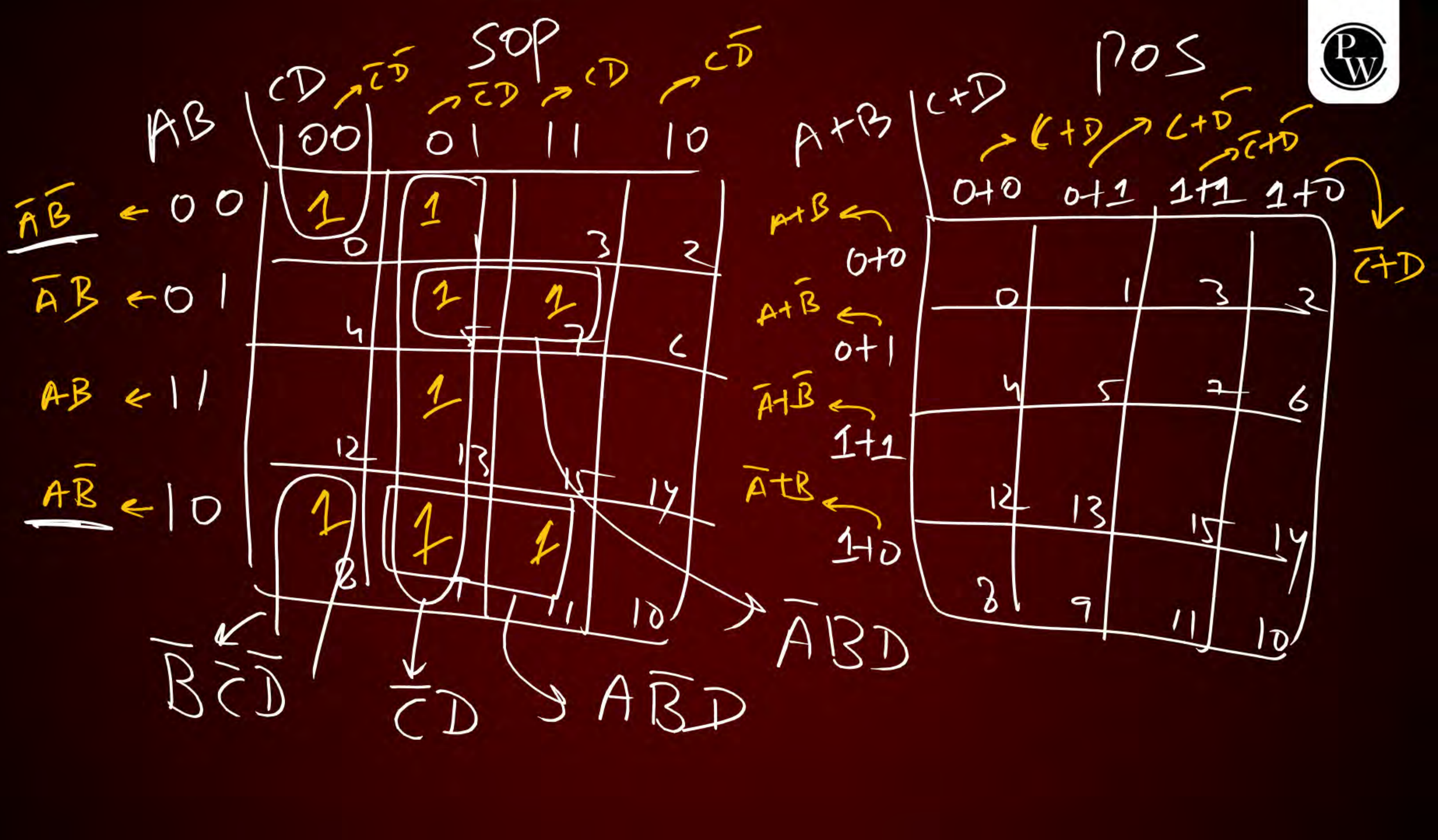
Question 4

(m+n+o+p) POS → A = 0, Ā = 1 → Maxterm

Minimize the expression: $F(m, n, o, p) = \pi_M(0, 1, 2, 3, 5, 9, 11) + d(7, 13, 14)$.



$$F = (m+n)\cdot(m+\bar{p})\cdot(n+\bar{p})$$


SOP
AB
CD
00
01
11
10
$\bar{A}\bar{B}$ ← 00
$\bar{A}B$ ← 01
AB ← 11
$A\bar{B}$ ← 10
$\bar{B}\bar{C}\bar{D}$
$\bar{C}D$
$A\bar{B}D$
$\bar{A}BD$
POS
A+B
C+D
0+0
0+1
1+1
1+0
$\bar{C}+D$
$\bar{A}+\bar{B}$
$\bar{A}+B$

Question 5

Minimize the expression: $F(A, B, C, D) = \Sigma_m(0, 1, 2, 3, 4, 6, 8, 9, 10, 11)$.

H.W.

Question 6

Convert the following in single precision: $(-100.625)_{10}$ into $(?)_{IEEE}$

H.W

Question 7

Identify the number represented by IEEE 754 single precision:

(01000001011000000000000000000000)




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Thank You