Paper 7, TDC Part-3
Chapter– 4, Combinational Logic Design
Lecture - 10

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Combinational Logic Design

Minimisation of POS Form :->

→ For minimising a given expression in POS form or for a given truth table, we ~~should~~ write zeros in the cells corresponding to maxterms for '0' outputs.

→ Then groups of zeros are formed.

→ Then write the Maxterm for ~~each~~ the

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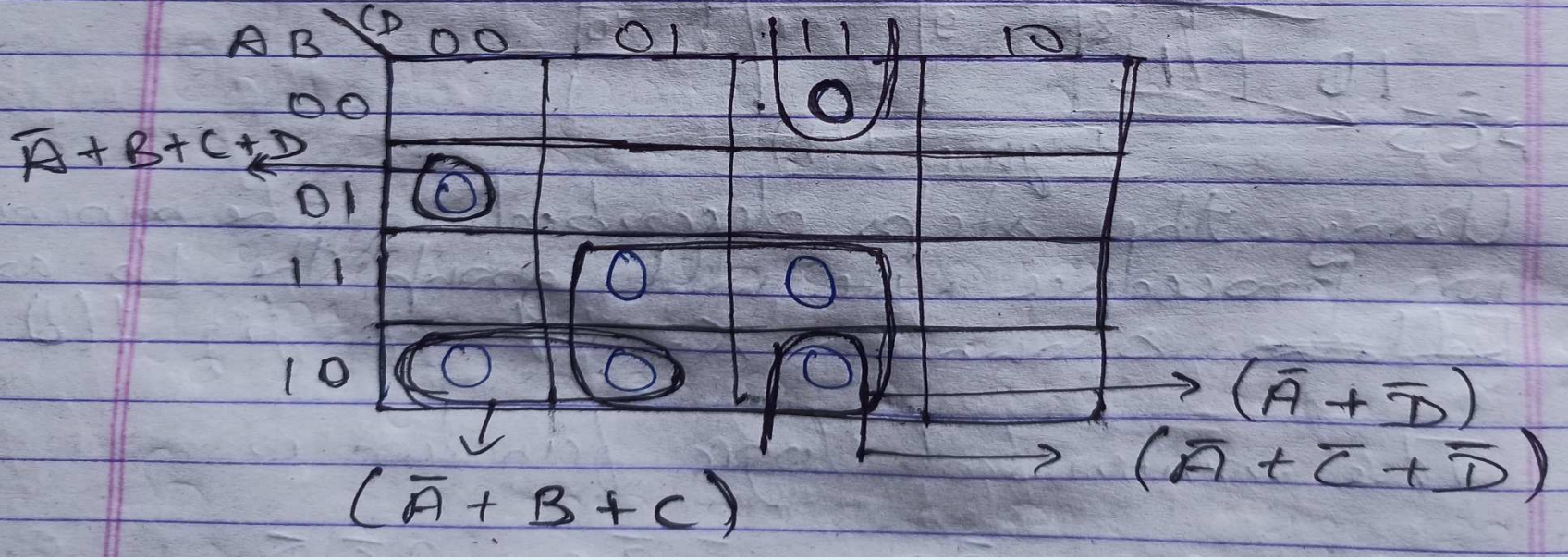
identified groups of zeros.

Eg:1→ Minimise the logic function express in eqn. below.

$f(A,B,C,D) = \Pi M(3, 4, 8, 9, 10, 13, 15)$

Soln:→ Let us draw the K-Map



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

So the Minimised expression in POS form can be written as.

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

Note:- A logic function may be written in SOP & POS form, while the minimization in SOP & POS form will have different number of terms and therefore require different quantities of hardware. So

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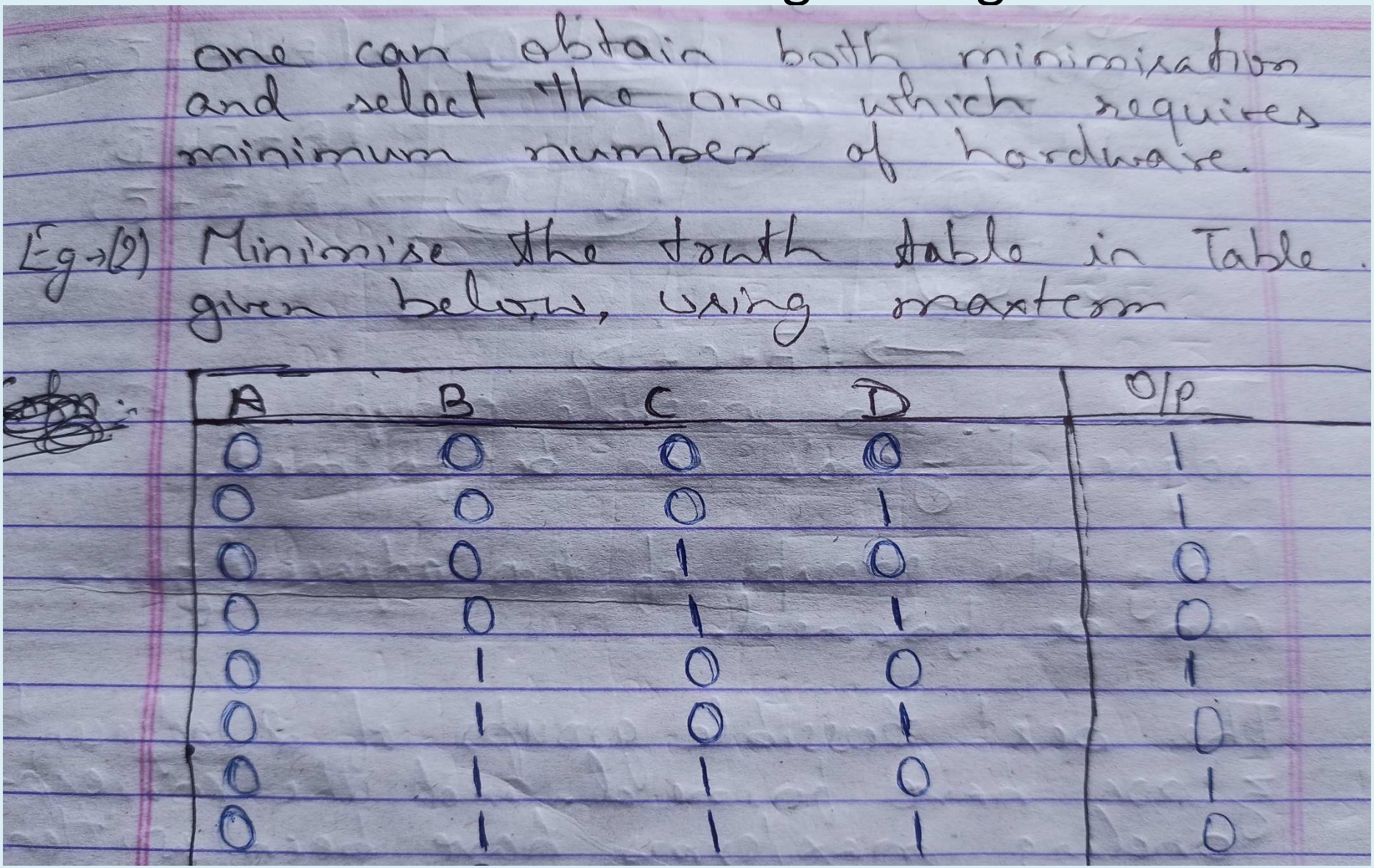

one can obtain both minimisation and select the one which requires minimum number of hardware.

Eg→(2) Minimise the truth table in Table given below, using maxterm

A	B	C	D	O/P
0	0	0	0	1
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0

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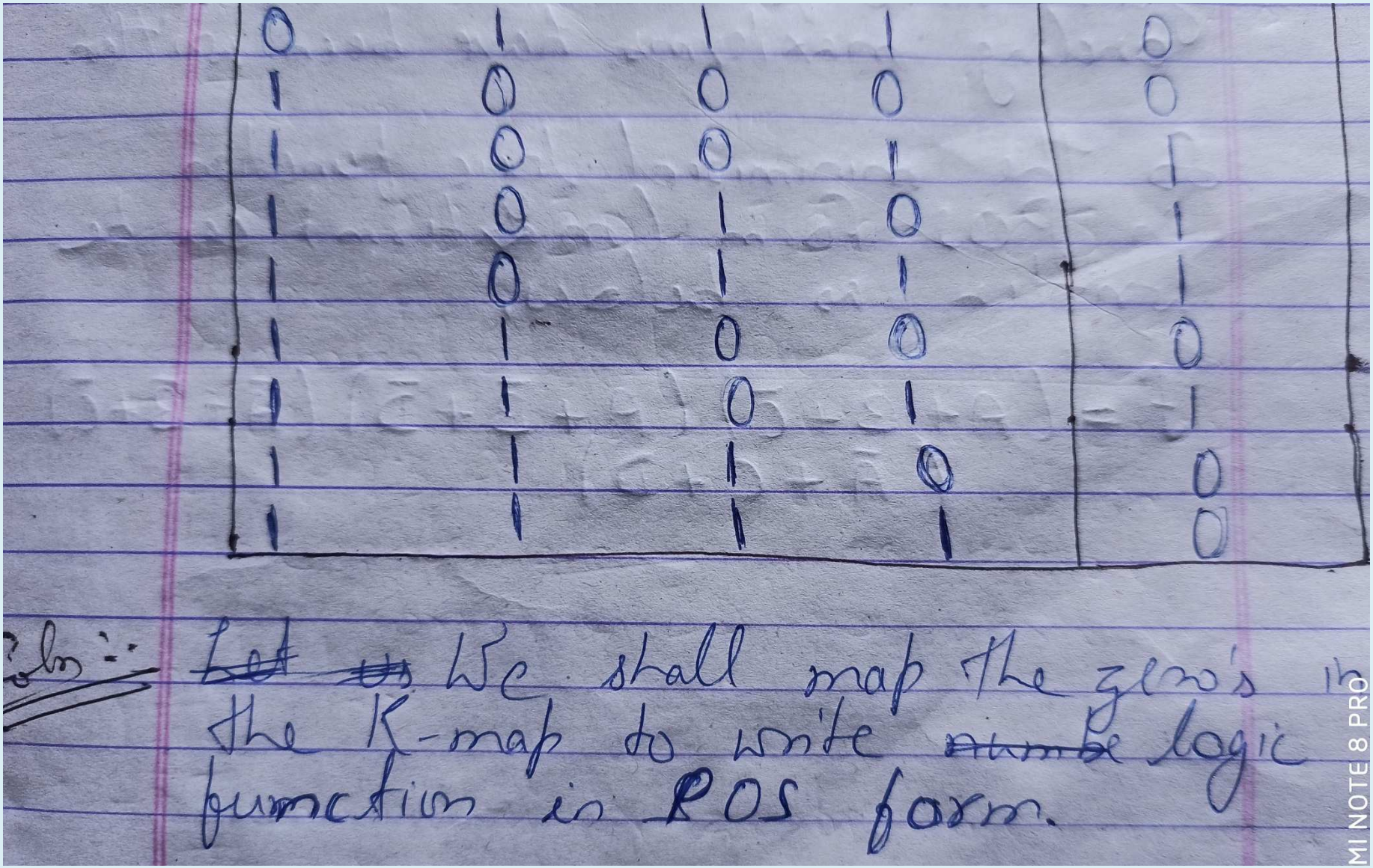

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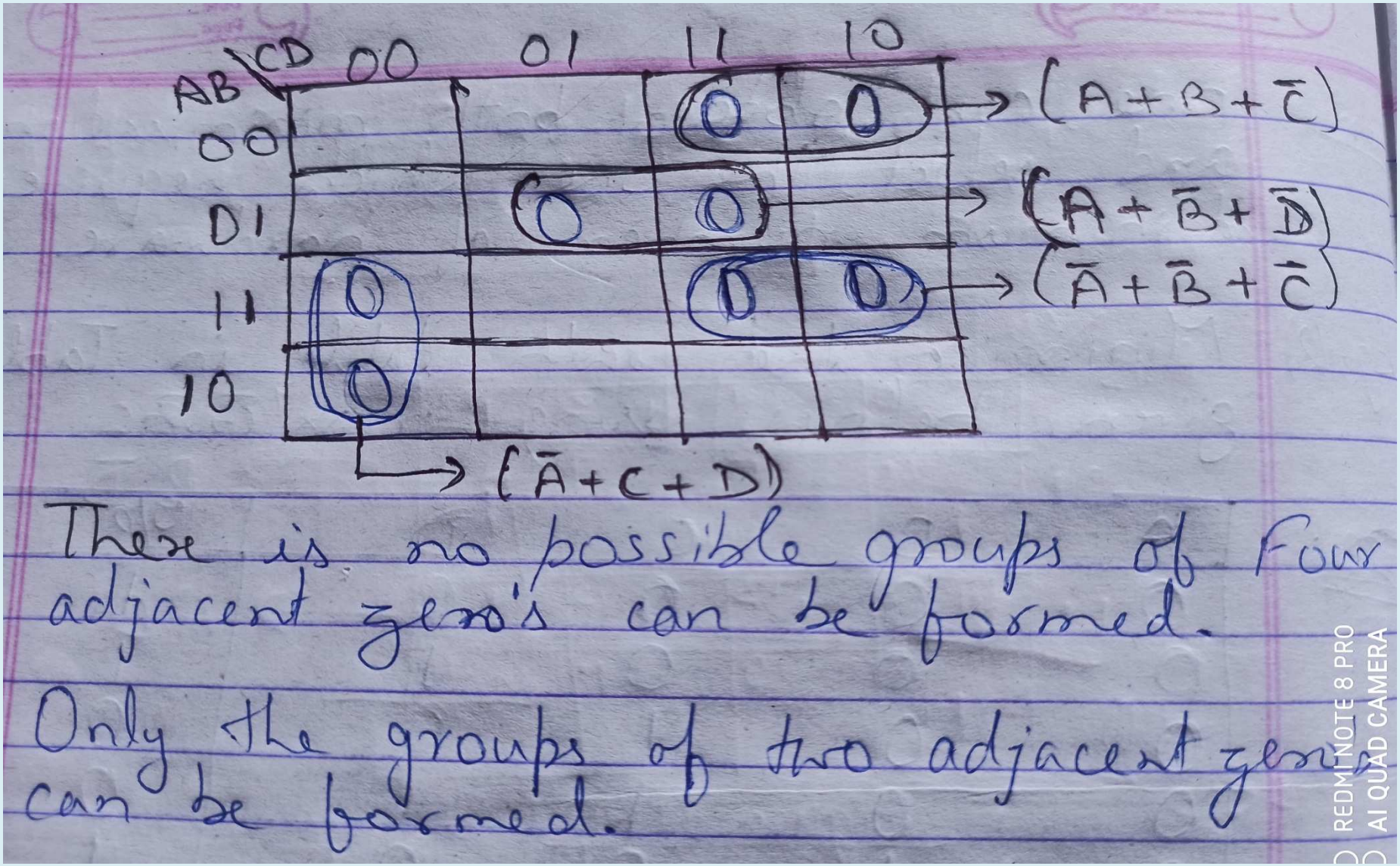

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can be formed.

The best possible groups of 2 adjacent zeros have formed and the corresponding maxterms have been written.

So the minimised logic function in POS form (maxterm) can be written as below,

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

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Refer book- Modern Digital Electronics by RP Jain.

Thank You