SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

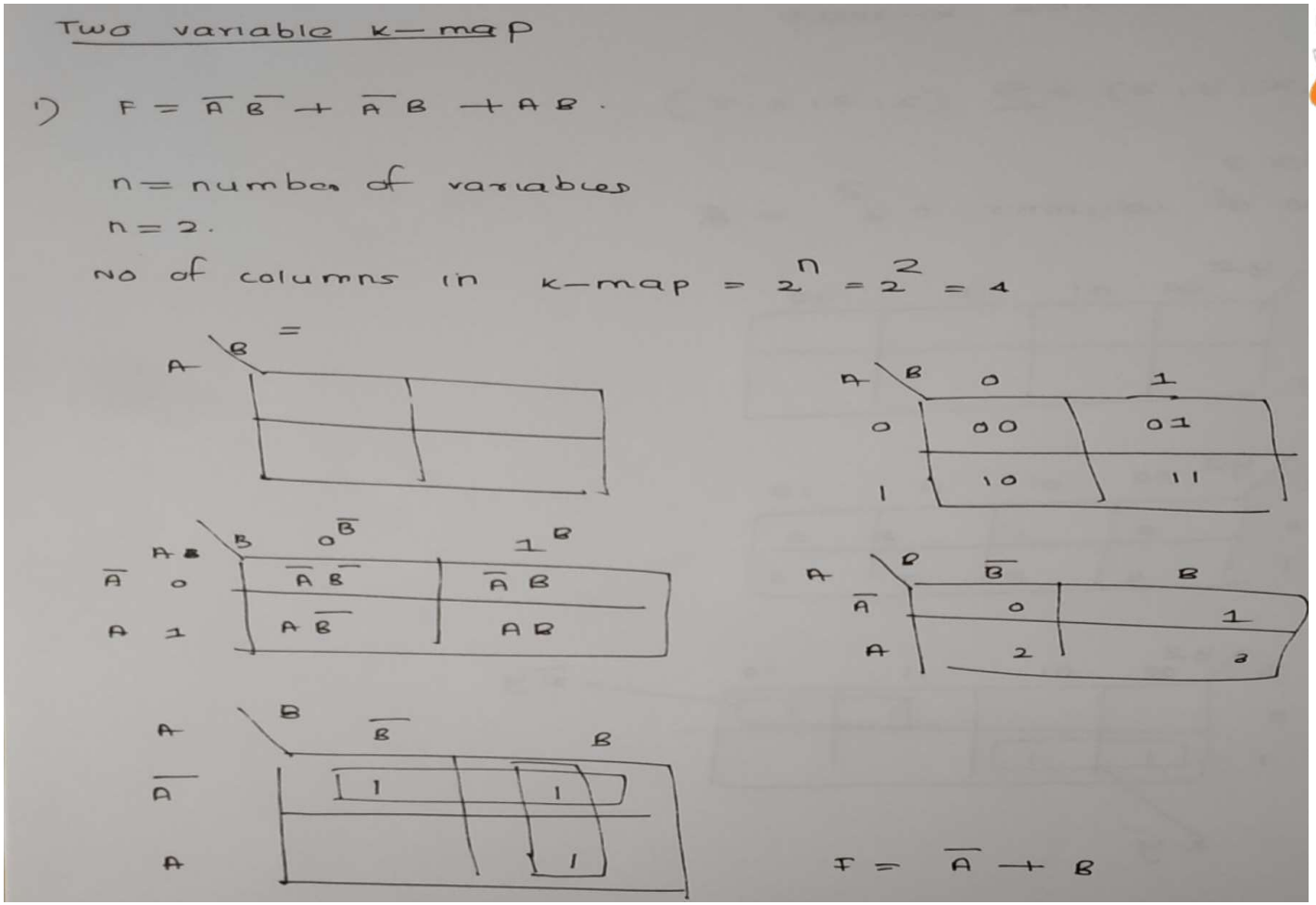
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

23ECB221 – DIGITAL ELECTRONICS

II YEAR/ III SEMESTER

UNIT 1 – MINIMIZATION TECHNIQUES AND LOGIC GATES

TOPIC - KARNAUGH MAP MINIMIZATION ,DON'T CARE CONDITIONS- Problems

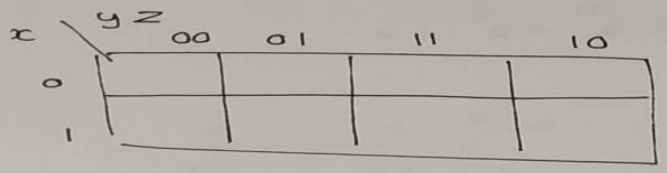

Two variable k-map
1) F = $\bar{A}\bar{B} + \bar{A}B + AB$.
n = number of variables
n = 2.
No of columns in k-map = $2^n = 2^2 = 4$
=
A B
A B 0 1
0 00 01
1 10 11
A B $0^{\bar{B}}$ 1^{B}
$\bar{A}$ 0 $\bar{A}\bar{B}$ $\bar{A}B$
A 1 $A\bar{B}$ AB
A B $\bar{B}$ B
$\bar{A}$ 1 1
A 1
A B $\bar{B}$ B
$\bar{A}$ 0 1
A 2 3
F = $\bar{A} + B$

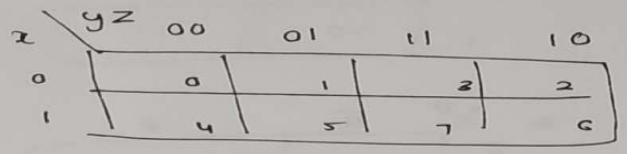
Three variable k- map

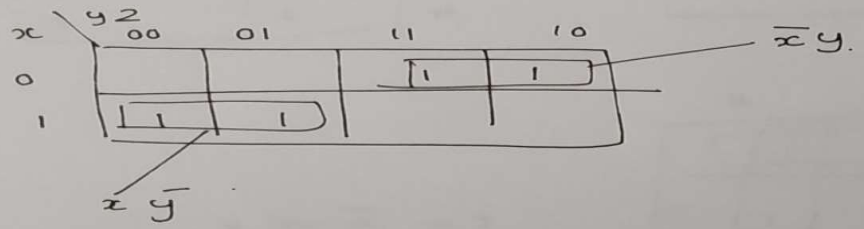
$F(x, y, z) = \sum (2, 3, 4, 5)$

$n = 3$

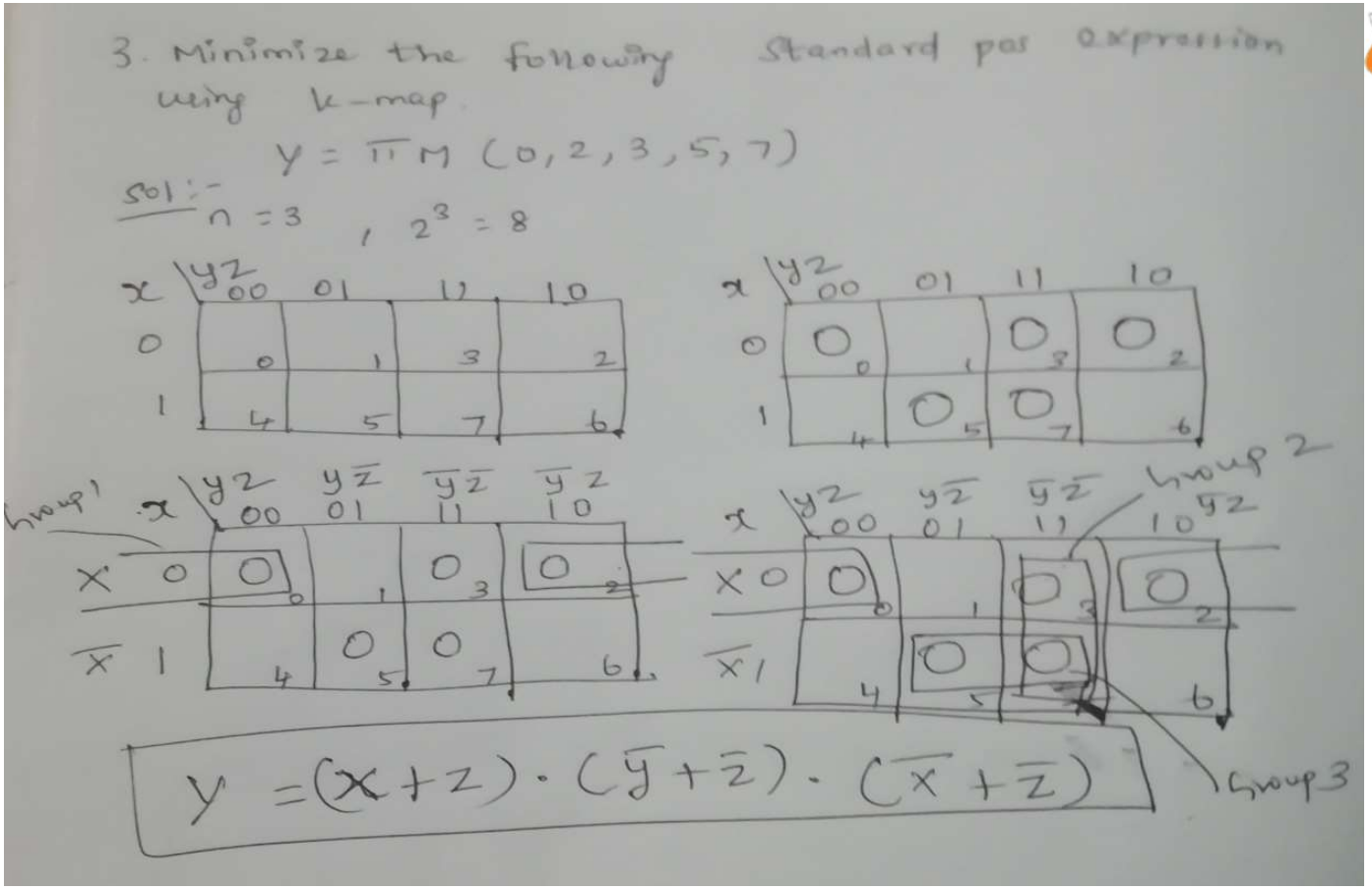
No. of columns $= 2^3 = 8$





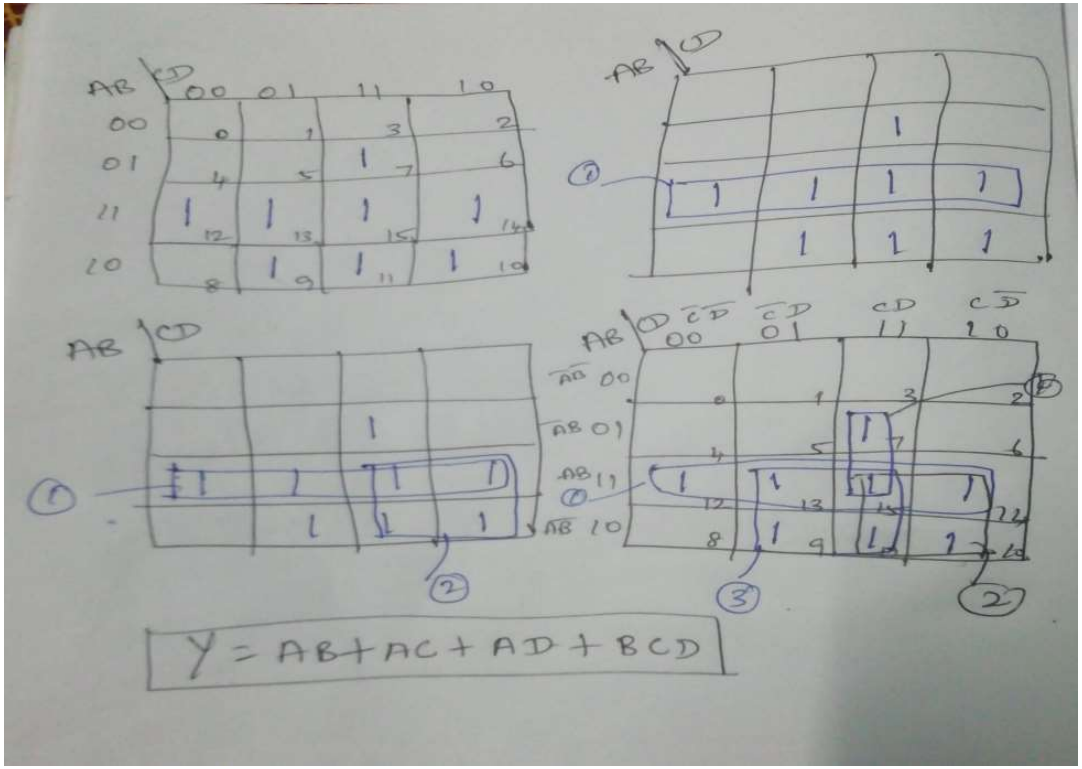


So $f(x, y, z) = \sum (2, 3, 4, 5) = \bar{x}y + x\bar{y}$


3. Minimize the following Standard pos expression using k-map.
$Y = \Pi M (0,2,3,5,7)$
Sol:-
$n = 3$, $2^3 = 8$
x
yz
00
01
11
10
0
1
Group 1
Group 2
Group 3
$y = (x+z) \cdot (\bar{y}+\bar{z}) \cdot (\bar{x}+\bar{z})$

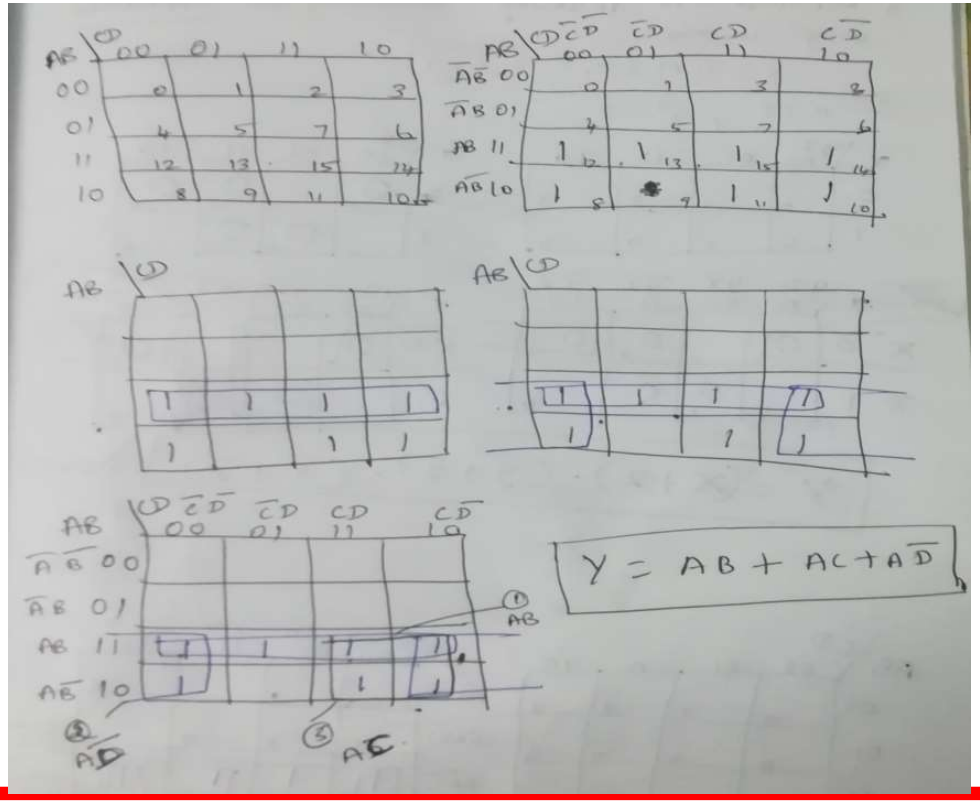
KARNAUGH MAP

4. Simplify the expression Y=∑m(7,9,10,11,12,13,14,15),using the K- map method.



KARNAUGH MAP - Simplifications

5. Plot the logical expression ABCD+AB'C'D'+AB'C+AB on a 4 variable K- map and obtain the simplified expression from the K- map.

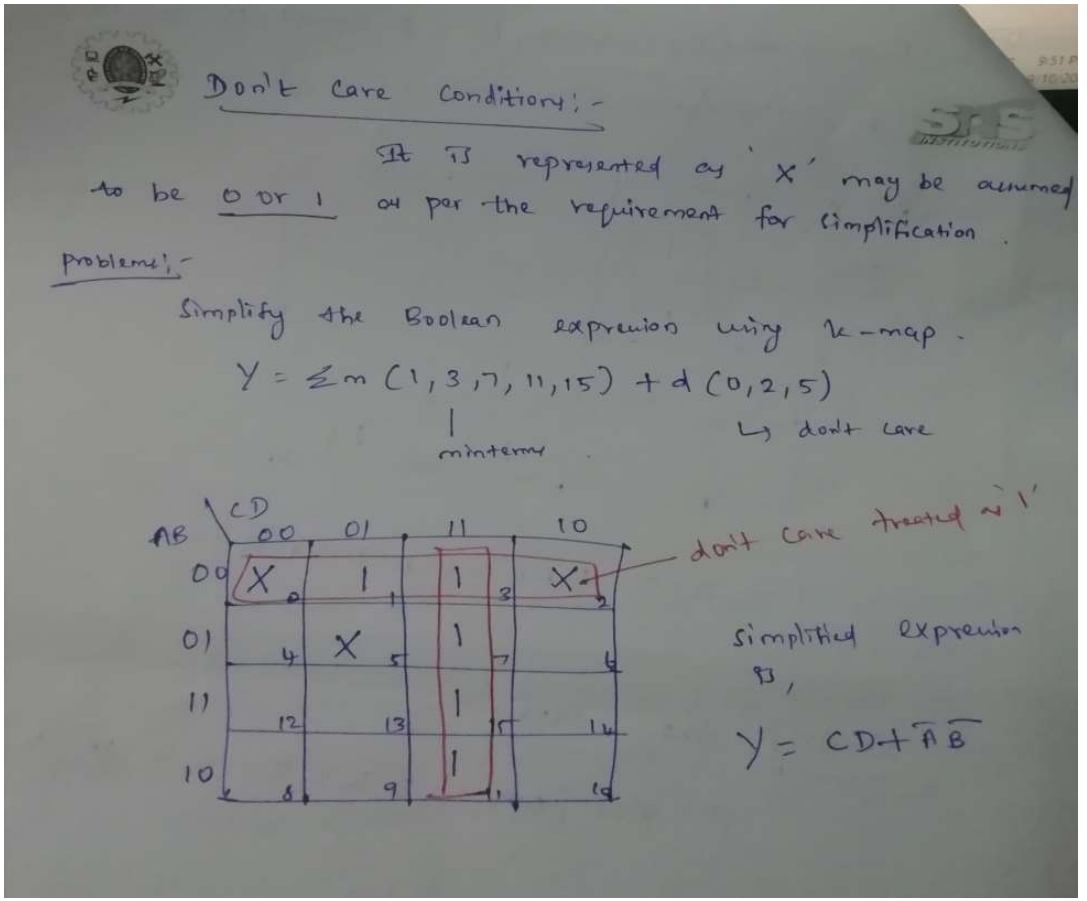


KARNAUGH MAP MINIMIZATION,DON'T CARE CONDITIONS /19ECB251/ DIGITAL ELECTRONICS/E.CHRISTINA DALLY/AP/ECE/SNSCT

Don’t Care Conditions

- Don't Care conditions allow us to replace the empty cell of a K-Map to form a grouping of the variables.
- While forming groups of cells, we can consider a “Don't Care” cell as either 1 or 0 or we can simply ignore that cell.
- Don't Care condition can help us to form a larger group of cells.

Don’t Care Conditions



THANK YOU