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

19ECB231 – 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 = $2^n = 2^2 = 4$

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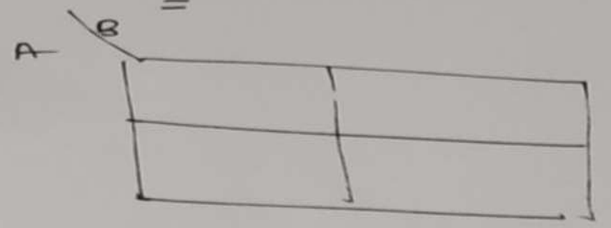
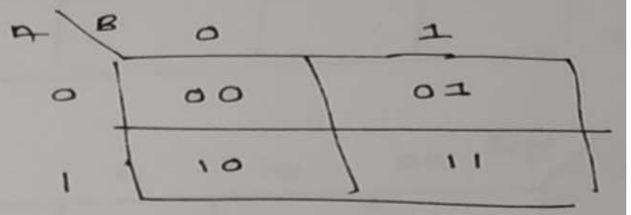
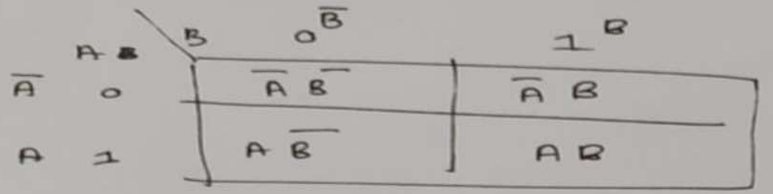
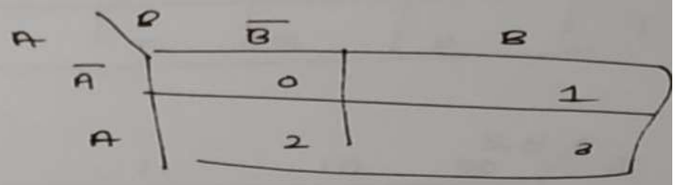
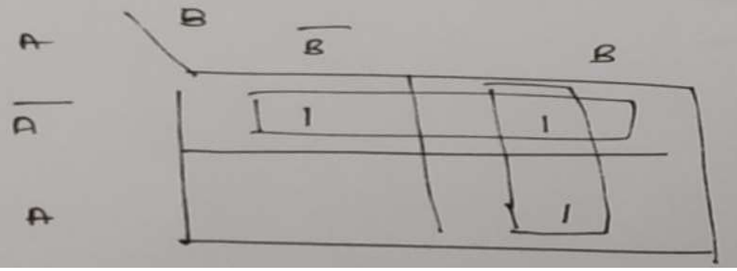










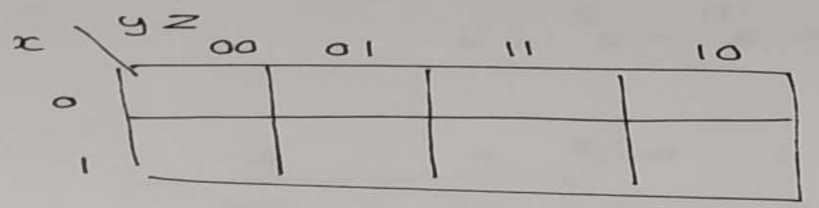
$F = \bar{A} + B$

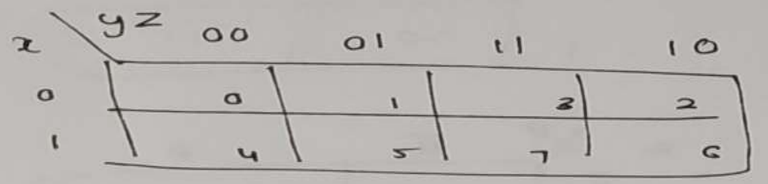
Three variable k-map

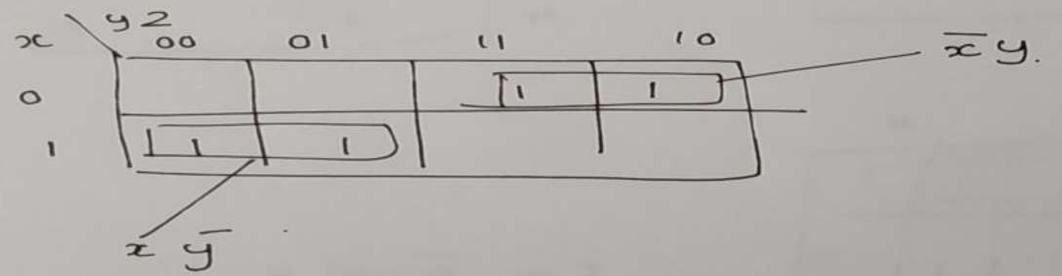
$F(x, y, z) = \sum (2, 3, 4, 5)$

$n = 3$

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







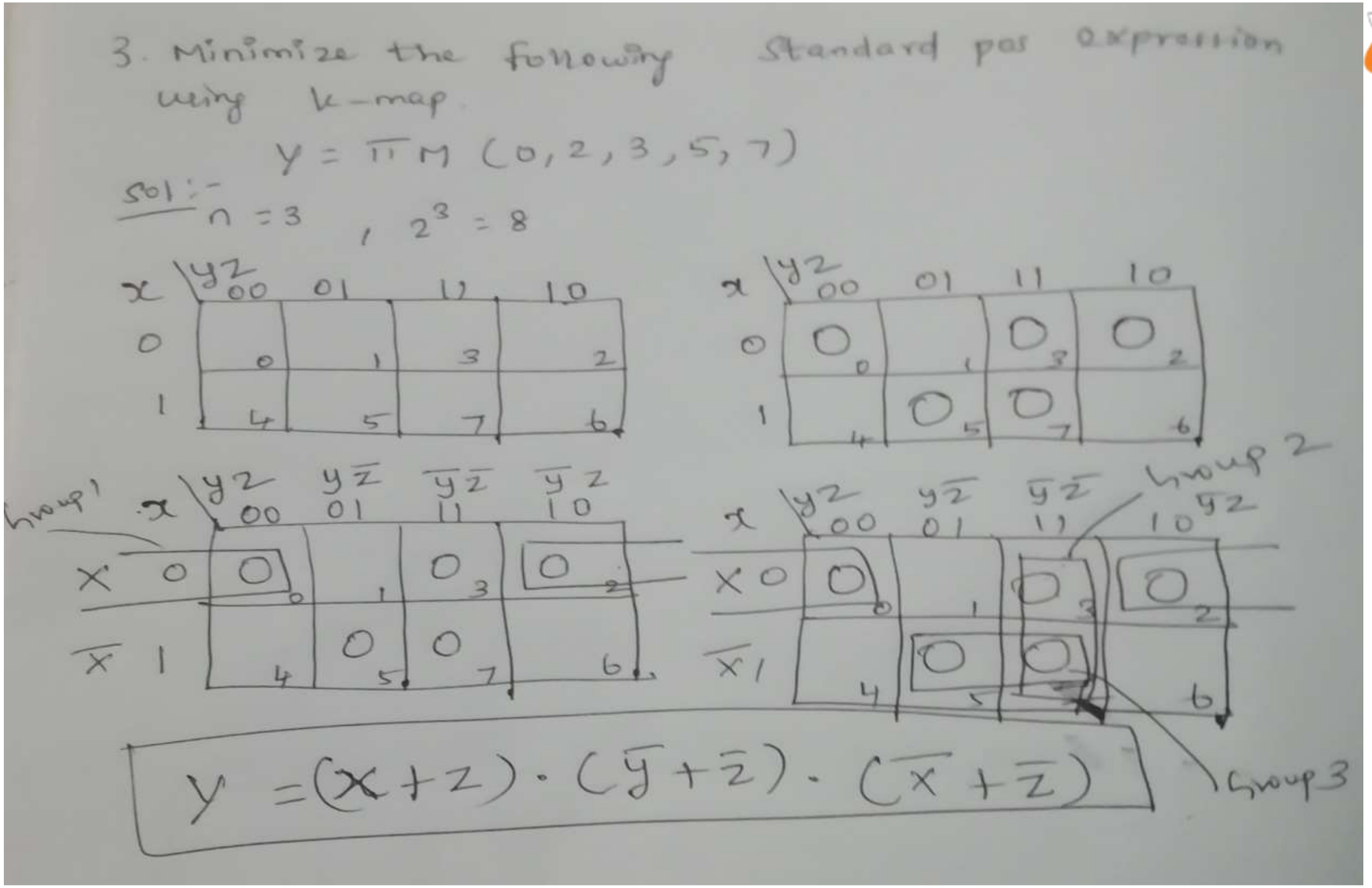
So $f(x, y, z) = \sum (2, 3, 4, 5) = \bar{x}y + x\bar{y}$

3. Minimize the following Standard pos expression using k-map.

$Y = \Pi M (0, 2, 3, 5, 7)$

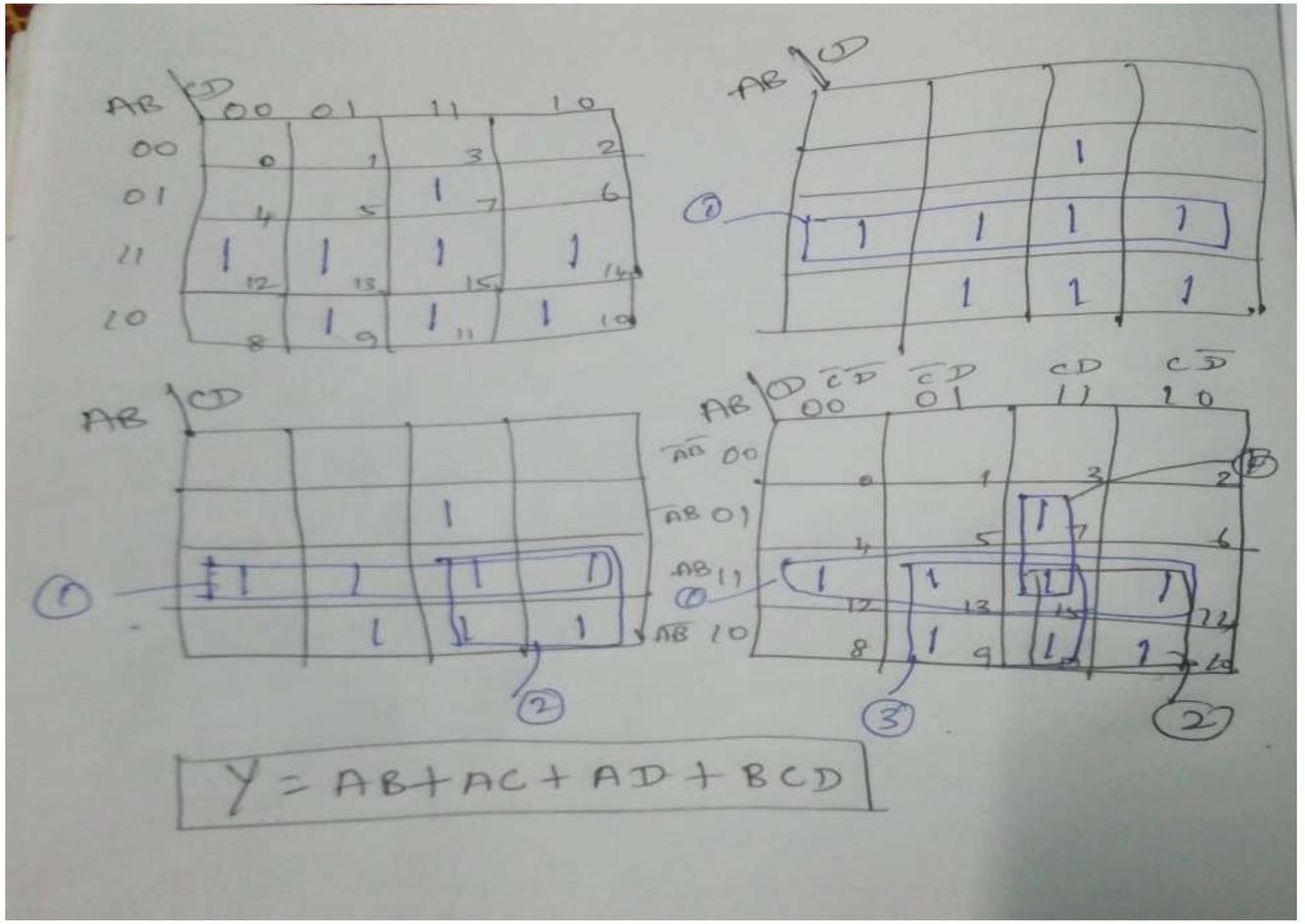
Sol:-

$n = 3$, $2^3 = 8$



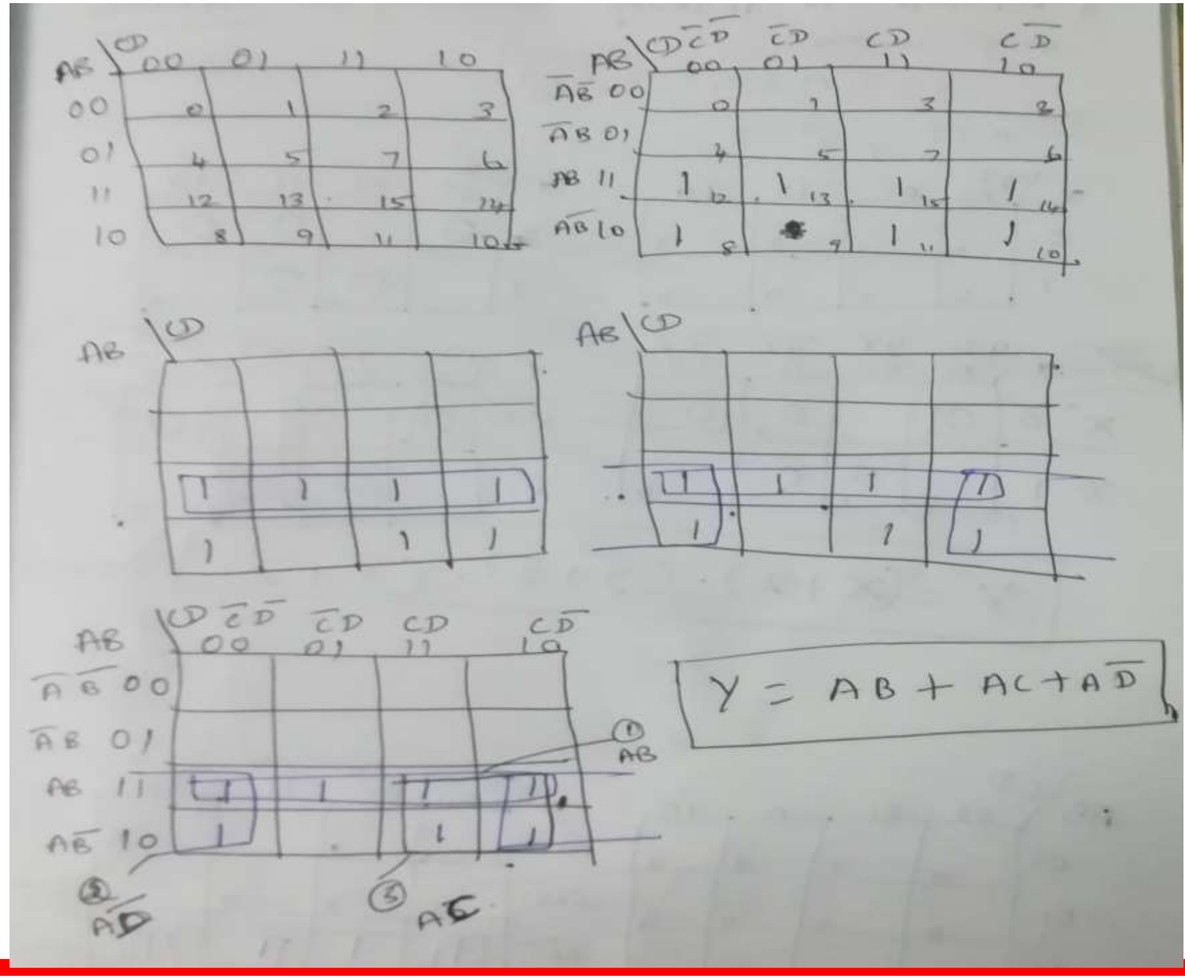
KARNAUGH MAP

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.



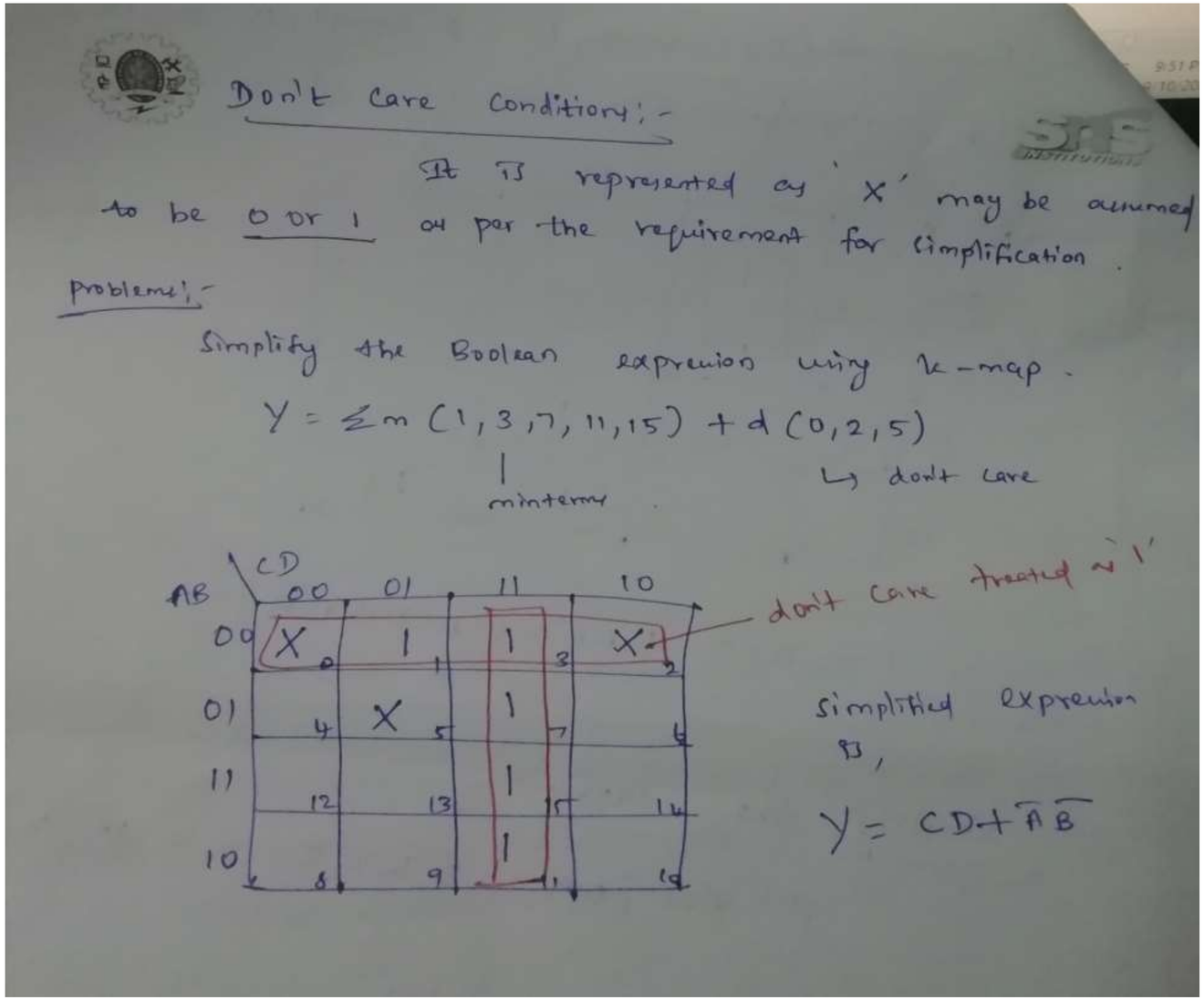
Don’t Care Conditions

- 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