CSE260 Lab Report-5

Experiment: Applications of Kmap Method

Group-1:

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LAB Report - 05

Name of the Experiment:

Applications of Kmap Method

Objective:

- To investigate the rules of Kmap
- To gain experience working with practical stuff.
- To simplify a complex function using Kmap.

Required components or Equipments:

1. AT-700 Portable analog/digital laboratory.
2. AND, OR & NOT IC.
3. Wires, trainer board & bread board.

Experimental setup:

For conducting the experiment a trainer board, bread board, wires and 1 IC-7408 AND gate, 1 IC-7432 OR gate & 1 IC-7404 NOT gate were used here. Here, 14 no pin is connected to the +Vcc (+5V) and 7 no pin to the GND position of the breaboard & trainer board. Now, at first for the first experiment.

1. A & D were taken as 2 inputs in AND gate pin no 1 & 2 respectively. Then another new input B was taken in pin no. 4. But this time another input is the inversion of D so NOT gate was used here. ~~Here~~ Hence, at NOT gate pin no 1 was used as input and pin no 2 was connected to pin no 5 of AND gate by a wire. And the resultant output from pin no 2 was connected to pin no 5 of AND gate. After that a new gate was used for a resultant output. From pin no 3 & 6 two outputs were taken as inputs of OR gate at pin no 1 & 2 respectively. Furthermore, A was again taken as input at pin no 10 and another new input C was taken at pin no 9. However, now the input B is inverted so again the NOT gate was used. Therefore, from pin no 2 of NOT gate an input

was taken to AND gate of pin no 13 via a wire and the output from pin no 8 was connected to pin no 12 of the similar gate. After that, through a wire pin no 3 & 6 was used as two inputs of OR gate at pin no 1 & 2 accordingly. And finally, pin no 11 of AND gate and pin no 3 of OR gate were taken as inputs for the OR gate again at pin no 4 & 5 respectively. Thus, we got the resultant output at pin no 6 of OR gate

2. Here, at first A & B were taken as input and connected at pin no 1 & 2 via AND gate. Then, again B was taken as input at pin no 4 and here a new input C was taken to the NOT gate pin no 1 by a wire. and the output was taken by another wire from pin no 2 to pin no 5 of AND gate. After that, from pin no 3 & 6 of the AND gate we got 2

outputs which later on was taken as inputs for an OR gate at pin no 1 & 2 serially. Then again, from pin no 1 A was taken as an input ~~for~~ in the NOT gate of pin no 3 by a wire and the output from pin no 4 was taken by another wire to pin no 10 as input. But here another new input was taken which is D at pin no 9 and the output was connected to the OR gate of pin no 4 later on. Lastly, at pin no 5 the output of pin no 3 was connected through a wire which gave us the final output at pin no 6.

4. Results:

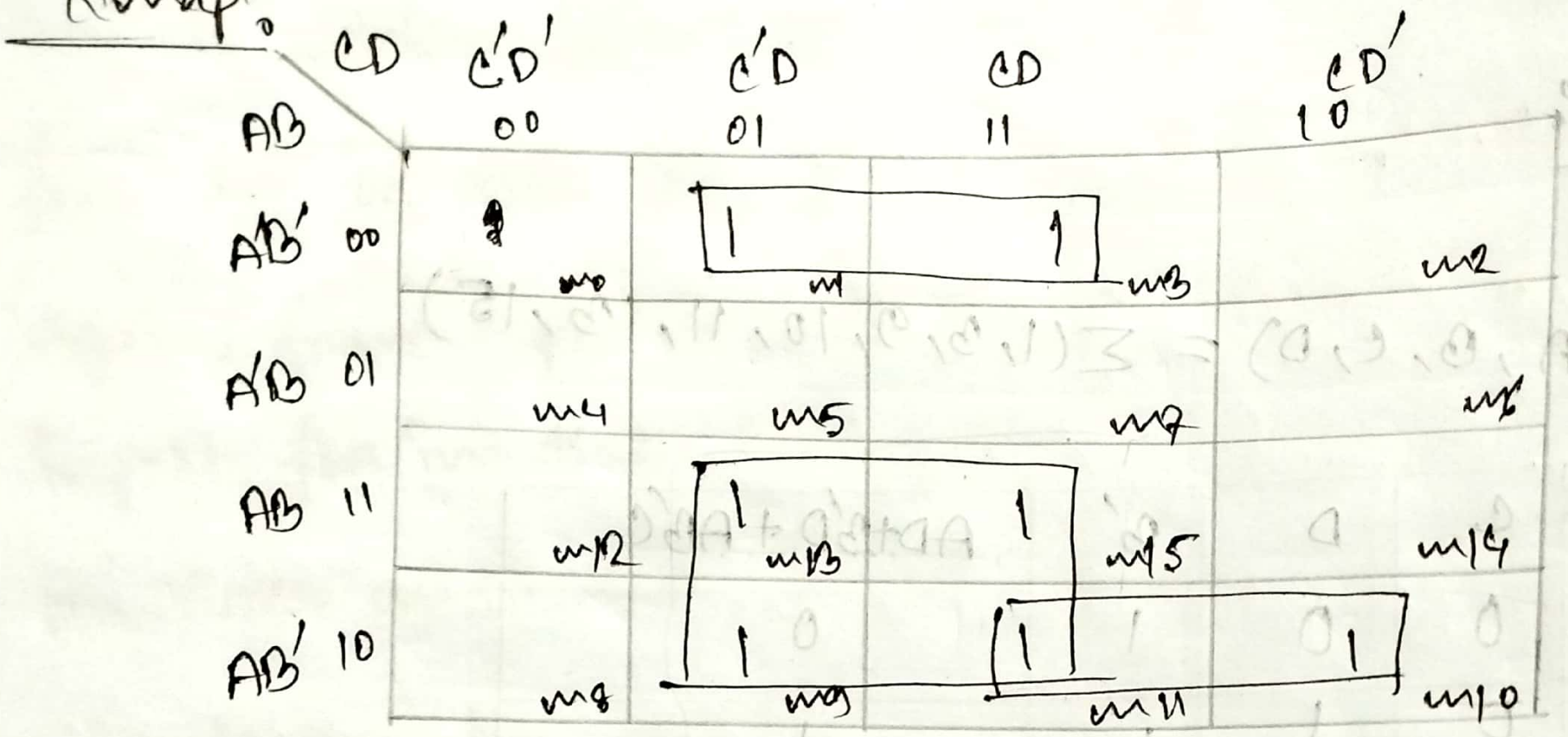
(*) Truth table:

1. Given

$$F(A, B, C, D) = \Sigma(1, 3, 9, 10, 11, 13, 15)$$

A	B	C	D	B'	AD+B'D+AB'C
0	0	0	0	1	0
0	0	0	1	1	1
0	0	1	0	1	0
0	0	1	1	1	1
0	1	0	0	0	0
0	1	0	1	0	0
0	1	1	0	0	0
0	1	1	1	0	0
1	0	0	0	1	0
1	0	0	1	1	1
1	0	1	0	1	0
1	0	1	1	1	1
1	1	0	0	0	0
1	1	0	1	0	1
1	1	1	0	0	0
1	1	1	1	0	1

Kmap:


CD
C'D'
C'D
CD
CD'
AB
00
01
11
10
AB' 00
AB 01
AB 11
AB' 10
m0
m1
m3
m2
m4
m5
m7
m6
m12
m13
m15
m14
m8
m9
m11
m10
1

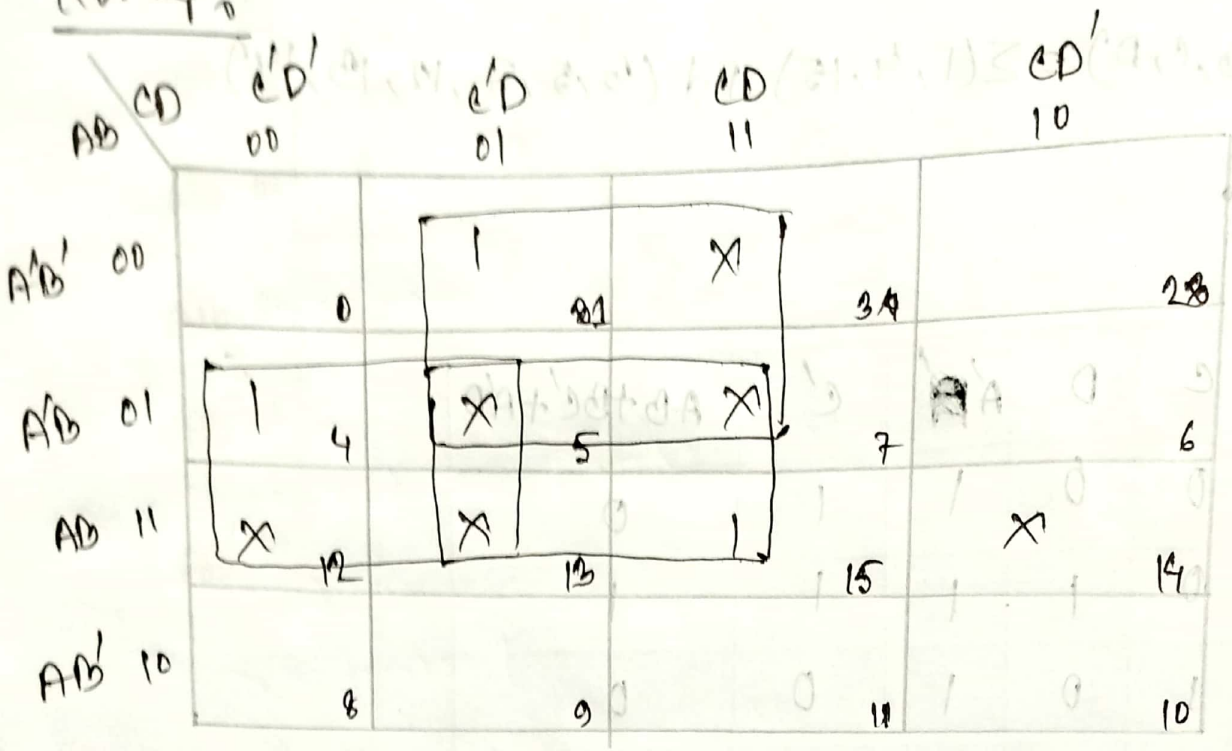
2. Given,

$F(A,B,C,D) = \Sigma(1,4,15)$ and $(3,5,7,12,13,14)$

(A) Truth table:

A	B	C	D	A'	C'	AB+BC'+A'D
0	0	0	0	1	1	0
0	0	0	1	1	1	1
0	0	1	0	1	0	0
0	0	1	1	1	0	1
0	1	0	0	1	1	1
0	1	0	1	1	1	1
0	1	1	0	1	0	0
0	1	1	1	1	0	1
1	0	0	0	0	1	0
1	0	0	1	0	1	0
1	0	1	0	0	0	0
1	0	1	1	0	0	0
1	1	0	0	0	1	1
1	1	0	1	0	1	1
1	1	1	0	0	0	1
1	1	1	1	0	0	1

Kmap:



Discussion:

From the above truth tables & tables of Kmap we get the equations of our 2 experiments. which are →

1. $AD + B'D + AB'C$

&2. $AB + BC' + A'D$