leah.a

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**Logic Design (ITNT202)**

**Assignment No. 1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Student Name:** |  | **Last date of Submission:** |  |
| **Student ID:** |  | **Marks:** | **10** |

Problem 1: Convert the following number system. *Show your solution.*

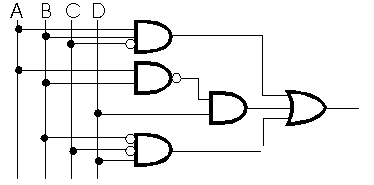
1. Addition of Binary Numbers
   1. 10101112 add to 11111112 is equal to 🡪

(011010110)2

1. Subtraction of Binary Numbers

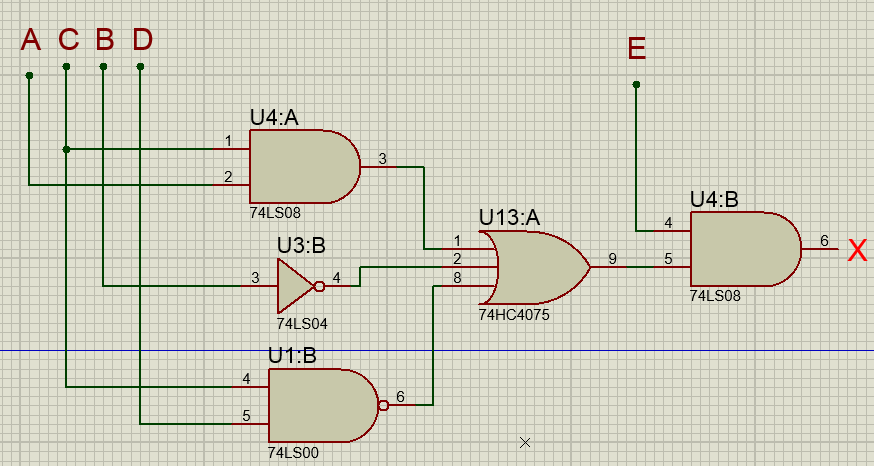
111000102 subtract to 10111112 🡪 (10000011)2

III: Find the output of following logic circuit

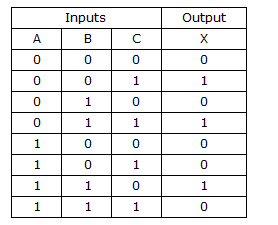
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IV: Draw the Logic circuit for the following Boolean expression

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V: Find the Boolean expression for the following truth table (SOP form).

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VI: Simplify the following Boolean expression using Boolean algebra.

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------rearranging terms

BC(+A) + +

As we kow that A+=1 and C+=1

BC(1)+

BC++

BC++)

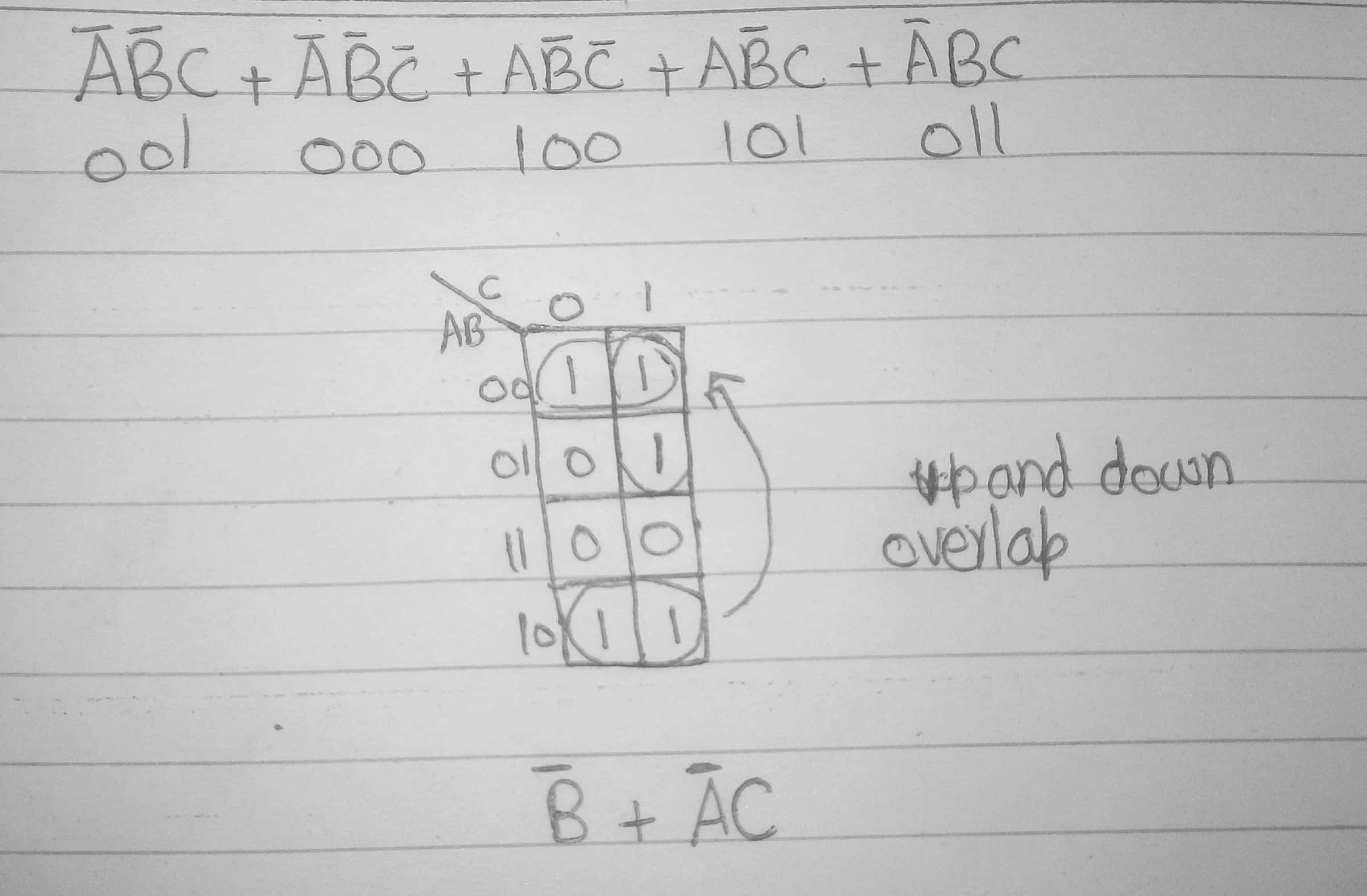
As we know that +=A+

BC+A+

BC++

VII: Use the K-Map to simplify the following standard SOP expression.





VIII. Analyze the given truth table to find out the simplified Boolean expression using K-Map SOP method. Write down the number of AND gates and OR gates used in the simplified circuit.

a) Finding of SOP Expression

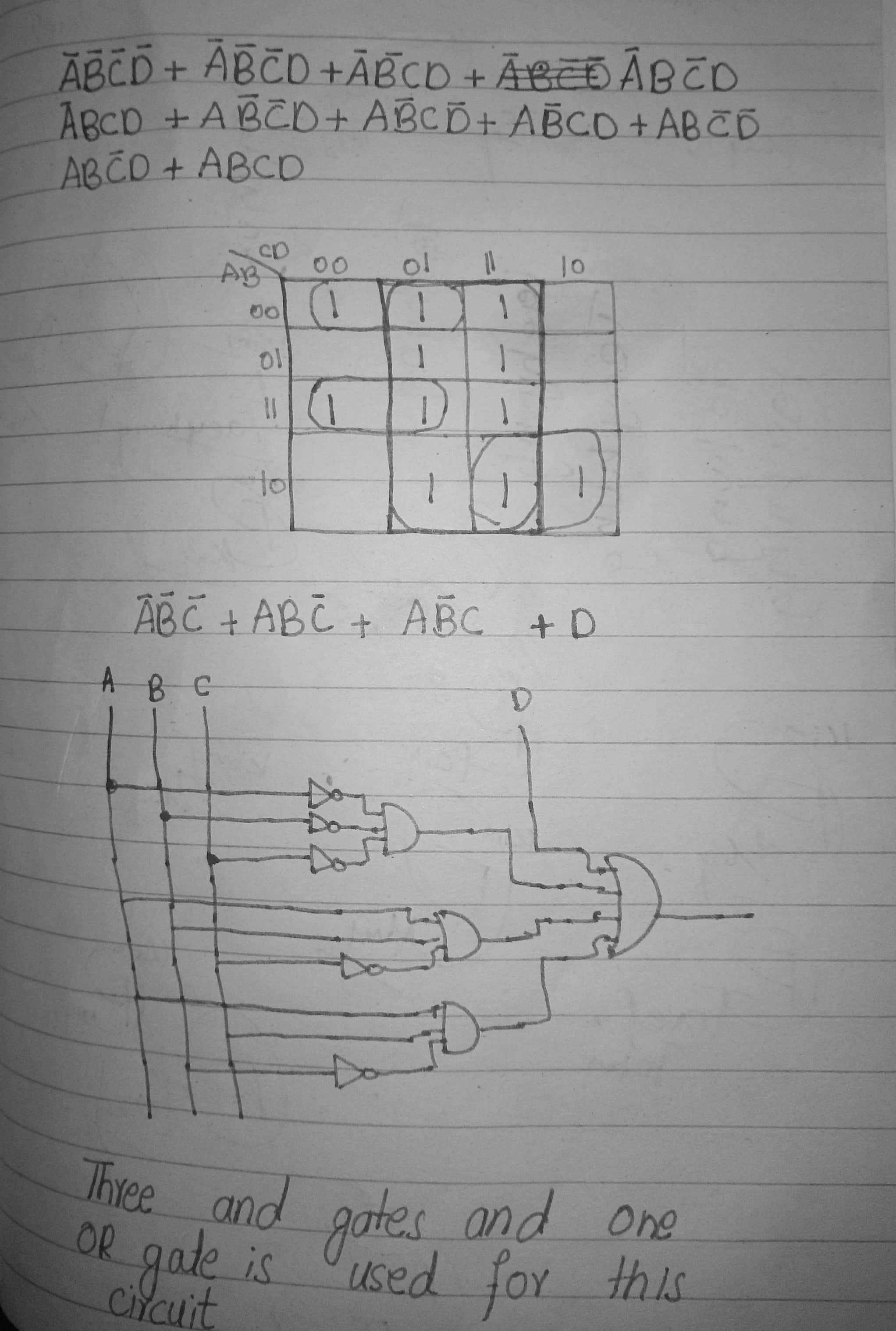
b) K-Map Entry

c) Find the Simplified expression

d) Draw the logic circuit of the simplified expression

e) Identify the number of gates used

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | | | | **Output** |
| **A** | **B** | **C** | **D** | **F(A,B,C,D)** |
| **0** | **0** | **0** | **0** | **1** |
| **0** | **0** | **0** | **1** | **1** |
| **0** | **0** | **1** | **0** | **0** |
| **0** | **0** | **1** | **1** | **1** |
| **0** | **1** | **0** | **0** | **0** |
| **0** | **1** | **0** | **1** | **1** |
| **0** | **1** | **1** | **0** | **0** |
| **0** | **1** | **1** | **1** | **1** |
| **1** | **0** | **0** | **0** | **0** |
| **1** | **0** | **0** | **1** | **1** |
| **1** | **0** | **1** | **0** | **1** |
| **1** | **0** | **1** | **1** | **1** |
| **1** | **1** | **0** | **0** | **1** |
| **1** | **1** | **0** | **1** | **1** |
| **1** | **1** | **1** | **0** | **0** |
| **1** | **1** | **1** | **1** | **1** |

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