CSE306 (Computer Architecture Sessional)

A Report On

**4-bit ALU Simulation**

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Section: B

Subsection: B1

Group NO: 3

Introduction:

Problem Specification:

We are to design a 4 bit-ALU Circuit as well as show the effects of various operations on flags as per the rules of Assembly Language.

Required Flags:

– Carry (C)

– Sign (S)

– Overflow (V)

– Zero (Z)

Assigned Instructions:

Inputs: A (4-bit)

B (4 bit)

cs1, cs2, cs3

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| cin | | | Functions | Form |
| cs2 | cs1 | cs3 |
| 0 | 0 | 0 | Subtract with borrow | A + B` |
| 0 | 0 | 1 | Subtract | A - B |
| 0 | 1 | 0 | AND | A ∧ B |
| 0 | 1 | 1 | Transfer A | A |
| 1 | x | 0 | Increment A | A + 1 |
| 1 | x | 1 | OR | A [∨](https://en.wikipedia.org/wiki/Vel_(symbol)) B |

Complete Circuit Diagram:

