# COMPUTER ARCHITECTURE EXPERIMENT – 2

**Implementation of Decoders**

**Aim:** In this experiment, students will be introduced to the operation of decoders and implement the full-adder circuit using decoders.

# Experimental Work:

*Consider the Full-Adder circuit:*

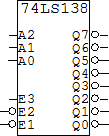
*S* (*x*, *y*, *z*)  *x*  *y*  *z*

*C*(*x*, *y*, *z*)  *x*.*y*  (*x*  *y*).*z*

Implement the Full-Adder circuit with decoder 74LS138 (or 74138) using:

1. multi-input NAND gates
2. 2-input NAND gates

Confirm that your decoder implementation is satisfying the truth table of Full-Adder.



Decoder

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | **y** | **z** | **(a)**  **C S** | | **(b)**  **C S** | |
| **0** | **0** | **0** | **0** | **0** | **0** | **0** |
| **0** | **0** | **1** | **0** | **1** | **0** | **1** |
| **0** | **1** | **0** | **0** | **1** | **0** | **1** |
| **0** | **1** | **1** | **1** | **0** | **1** | **0** |
| **1** | **0** | **0** | **0** | **1** | **0** | **1** |
| **1** | **0** | **1** | **1** | **0** | **1** | **0** |
| **1** | **1** | **0** | **1** | **0** | **1** | **0** |
| **1** | **1** | **1** | **1** | **1** | **1** | **1** |

