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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:

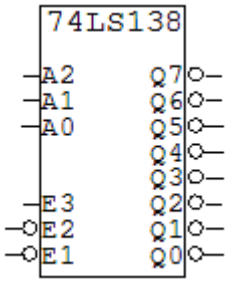
Consider the Full-Adder circuit:

$$S(x, y, z) = x \oplus y \oplus z$$
$$C(x, y, z) = x.y + (x \oplus y).z$$

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

a) multi-input NAND gates
b) 2-input NAND gates

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



Decoder

x	y	z	(a) C	(a) S	(b) C	(b) 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

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