**Objectives:**

* To design a combinational circuit from descriptive problem specification.
* To implement a combinational circuit using AND-OR and OR-AND logic.

**Answers to the Post-Lab Questions**

**1. Sum of Products**

F (A,B,C,D)= A+BC

|  |  |
| --- | --- |
| **A B C D** | **F** |
| 0 0 0 0 | 0 |
| 0 0 0 1 | 0 |
| 0 0 1 0 | 0 |
| 0 0 1 1 | 0 |
| 0 1 0 0 | 0 |
| 0 1 0 1 | 0 |
| 0 1 1 0 | 1 |
| 0 1 1 1 | 1 |
| 1 0 0 0 | 1 |
| 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 | 1 |
| 1 1 1 1 | 1 |

**Product of Sums**

F (A,B,C,D)= (A+B)(A+C)

|  |  |
| --- | --- |
| **A B C D** | **F** |
| 0 0 0 0 | 0 |
| 0 0 0 1 | 0 |
| 0 0 1 0 | 0 |
| 0 0 1 1 | 0 |
| 0 1 0 0 | 0 |
| 0 1 0 1 | 0 |
| 0 1 1 0 | 1 |
| 0 1 1 1 | 1 |
| 1 0 0 0 | 1 |
| 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 | 1 |
| 1 1 1 1 | 1 |

**2. Sum of Products**

F (A, B, C, D)= A+BC

module exp( input A,B,C , output F);

wire w1,w2;

and g1 (w1, A),

g2 (w2 ,B,C),

or g3( F, w1, w2 );

endmodule

**Product of Sums**

F (A,B,C,D)= (A+B)(A+C)

module exp(input A,B,C, output F);

wire w1, w2, w3;

or g1( A,B),

g2 (A,C),

and g3( F, w1, w2);

endmodule

**Conclusion:**

In this experiment, getting the output of a combinational circuit we have used pin diagram of the required ICs. By using AND gates and OR gates, we verified the truth table from the circuit.