4. For the following logic function, find out the truth table, write down the logic expression. Simplify the logic expression as far as possible using Boolean algebra and then implement it. F (A, B, C, D) =Σ (6, 9, 12, 15)

Required Instruemnts: IC 7404, IC 7408, IC 7432, Power, Wires, Input

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A | B | C | D | OUTPUT |
| 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 | 0 |
| 1 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 | 1 |
| 1 | 0 | 1 | 0 | 0 |
| 1 | 0 | 1 | 1 | 0 |
| 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 0 | 1 | 0 |
| 1 | 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 |

Logic Expression:

6,9,12,15 in binary : 0110, 1001, 1100, 1111

Applying SOP (Sum of product) we get output= A’BCD’ + AB’C’D + ABC’D’ + ABCD

This is already simplified.

Diagram:

