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Question no. 5

Truth table:

| w | x | y | z | F (output) |
|---|---|---|---|------------|
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 1 | 0 | 1 |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 1 | 0 | 0 | 1 |
| 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 1 |
| 0 | 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 | 0 |
| 1 | 0 | 1 | 0 | 0 |
| 1 | 0 | 1 | 1 | 0 |
| 1 | 1 | 0 | 0 | 0 |
| 1 | 1 | 0 | 1 | 0 |
| 1 | 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 |

Equation:

$$F = \Sigma (2, 4, 6, 15)$$

$$= m_2 + m_4 + m_6 + m_{15}$$

$$= \underline{\underline{m_2 + m_4 + m_6 + m_{15}}}$$

$$= \overline{m_2} \cdot \overline{m_4} \cdot \overline{m_6} \cdot \overline{m_{15}}$$

Logic Diagram :

