

GATE:IN-40-2023

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I. QUESTION

The Simplified form of the boolean function $F(W, X, Y, Z) = \Sigma(4, 5, 10, 11, 12, 13, 14, 15)$ with the minimum number of terms and smallest number of literals in each term is

- (A) $WX + \overline{W}X\overline{Y} + W\overline{X}Y$
- (B) $WX + WY + X\overline{Y}$
- (C) $X\overline{Y} + WY$
- (D) $\overline{X}Y + \overline{W}.\overline{Y}$

II. SOLUTION

It is evident from the kmap that the smallest literal term will be

| WX \ YZ | YZ | | | |
|---------|----|----|----|----|
| | 00 | 01 | 11 | 10 |
| 00 | 0 | 0 | 0 | 0 |
| 01 | 1 | 1 | 0 | 0 |
| 11 | 1 | 1 | 1 | 1 |
| 10 | 0 | 0 | 1 | 1 |

$$F(W, X, Y, Z) = X\overline{Y} + WY \quad (1)$$

Code for implementation through AVR-GCC onto arduino-uno write link here