GATE:IN-40-2023

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	00	01	11	10
00	0	0	0	0
01	1	1	0	0
11	1	1	1	1
10	0	0	1	1

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

Therefore option (C) is correct.
Code for implementation through AVR-GCC onto arduino-uno.
https://github.com/Gandubs/Digital-Design/blob/master/Assignments/in'23-40/codes/main.c