



**United International University**

**Department of CSE**

**Course Code: Cse1325**

**Course Name: Digital Logic Design**

**Section : K**

**Mid Assignment no.2**

**Deadline: 24 September 2024**

**Submitted To**

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## Assignment - 2

Ans. to the ques. no: 5

(A)

$$F(x, y, z) = wxz + wxz' + w'xy.$$

$$= WXZ(Y+Y') + WXZ'(Y+Y') + W'XY(Z+Z')$$

$$= WXYZ + WXY'Z + WXYZ' + WXY'Z' + W'XYZ + W'XY'Z'$$

$$= \sum_m (15, 13, 14, 12, 7, 6)$$

$$= T_m(0, 1, 2, 3, 4, 5, 8, 9, 10, 11)$$

Hand-drawn Karnaugh map for a 4-variable function with variables  $W, X, Y, Z$ . The map is a 4x4 grid with cells labeled 0 through 15. The top row is labeled  $\overline{Y}$ , the bottom row is labeled  $\overline{Z}$ , the left column is labeled  $\overline{W}$ , and the right column is labeled  $\overline{X}$ .

$\overline{W} \backslash \overline{Y}$	0	1	2	3
0	0	1	0	0
4	0	5	0	7
12	0	13	0	14
8	0	9	0	11

The map contains several 0s and 1s, with some cells grouped by rectangles. The groups are:

- Group 1: Cells 0, 1, 4, 5 (a 2x2 square).
- Group 2: Cells 0, 4, 8, 12 (a 4x1 column).
- Group 3: Cells 1, 5, 9, 13 (a 4x1 column).
- Group 4: Cells 2, 6, 10, 14 (a 4x1 column).
- Group 5: Cells 3, 7, 11, 15 (a 4x1 column).

Product of Sum (POS) =  $X \cdot (W+Y)$

Am

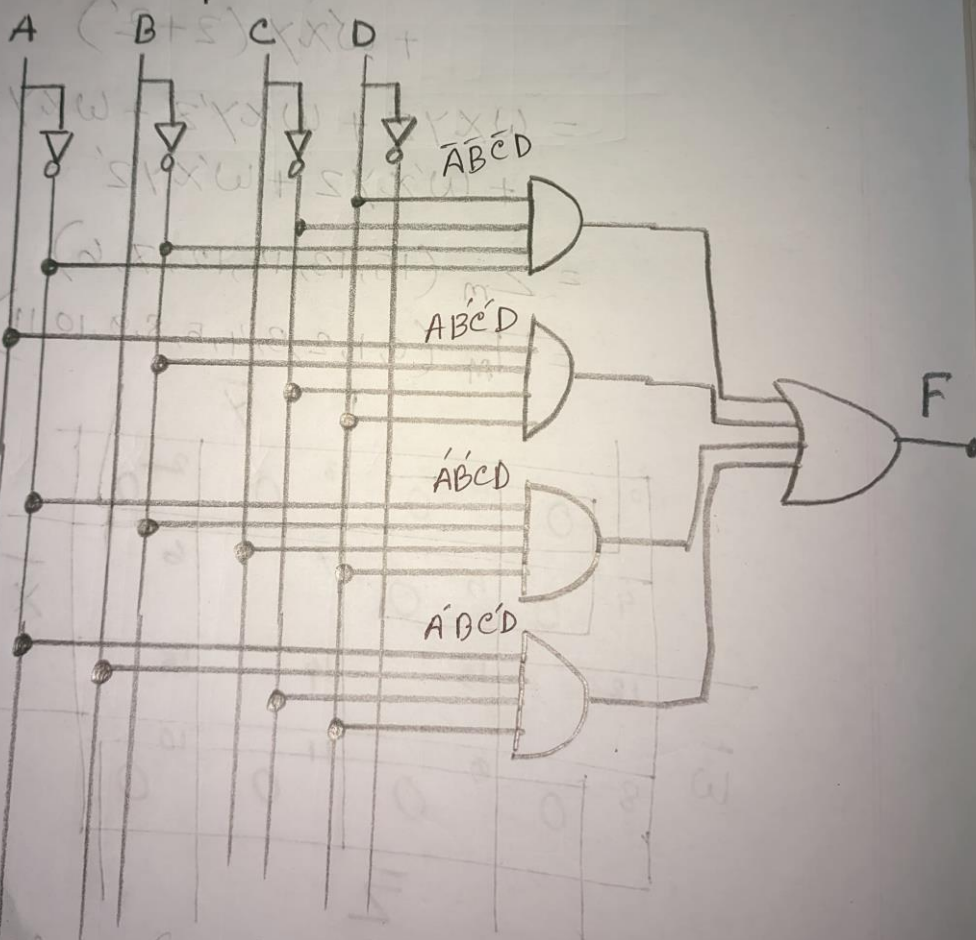
Assignment 2

(B)

$$F(A, B, C, D) = \bar{A}\bar{B}\bar{C}D + A\bar{B}\bar{C}D + \bar{A}\bar{B}CD + \bar{A}B\bar{C}D$$

(A)

PLA



Product of sum for function

Ans. to the ques. no: 6 - ①

① Truth table:

Apple	Banana	Cherries	Dates	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	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

② K-map:  $\Sigma \text{m}(1, 5, 7, 13, 15, 17, 19)$

	0	1	3	2	
	4	5	7	6	B
	12	13	15	14	
A	8	9	11	10	
					D

Sum-of-Product:  $BD + BC + AD + AC$

③

