5. Write the minimized DNF (disjunctive normal form) for the logical function.

Truth table:

X_1	X_2	X_3	X_4	Y
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	0
1	0	1	1	0
1	1	0	0	1
1	1	0	1	1
1	1	1	0	0
1	1	1	1	1

Karnaugh map:

Answ. $X_1 \cdot \overline{X_3} + X_2 \cdot X_3 \cdot X_4 + \overline{X_1} \cdot \overline{X_2} \cdot X_3$

or

Answ. $X_1 \wedge {!}X_3 \vee X_2 \wedge X_3 \wedge X_4 \vee {!}X_1 \wedge {!}X_2 \wedge X_3$