QUESTLINE-5 / XOR-RIDDLE

N XOR 23 = 45

$N \oplus 23 = 45$

$(N \oplus 23) \oplus 23 = 45 \oplus 23$

$N \oplus (23 \oplus 23) = 45 \oplus 23$ (commutative property)

$\Rightarrow N = 45 \oplus 23$ ($\because 23 \oplus 23 = 0$) & ($N \oplus 0 = N$)

45 → binary

2	45	1
2	22	0
2	11	1
2	5	1
2	2	0
	1	

23 → binary

2	23	1
2	11	1
2	5	1
2	2	0
	1	

$45_{10} = (101101)_2$

$23_{10} = (010111)_2$

45 (101101)	⊕	23 (010111)	=	RESULT (N)
1	⊕	0	=	1
0	⊕	1	=	1
1	⊕	0	=	1
1	⊕	1	=	0
0	⊕	1	=	1
1	⊕	1	=	0

$111010_2 \rightarrow$ decimal $\Rightarrow 1\times2^5 + 1\times2^4 + 1\times2^3 + 0\times2^2 + 1\times2 + 0\times2^0$

$= 32 + 16 + 8 + 0 + 2 + 0$

$= 58_{10}$

$\therefore N = 111010_2 = 58_{10}$