Problem 1

A

i. $11_2 : 1 \times 2^1 + 1 \times 2^0 = 3$

ii. $101_2 : 1 \times 2^2 + 0 \times 2^1 + 1 \times 20 = 5$

iii. $1000_2 : 1 \times 2^3 + 0 \times 2^2 + 0 \times 2^1 + 0 \times 2^0 = 8$

iv. $1101_2 : 2^3 + 2^2 + 0^3 + 2^0 = 13$

v. $101011_2 : 2^5 + 0^4 + 2^3 + 0^2 + 2^1 + 2^0 = 43$

vi. $100110_2 : 2^5 + 0^4 + 0^3 + 2^2 + 2^1 + 0^0 = 38$

vii. $11110_2 : 2^4 + 2^3 + 2^2 + 2^1 + 0^0 = 30$

viii. $10000000_2 : 2^7 + 0^6 + 0^5 + 0^4 + 0^3 + 0^2 + 0^1 + 0^0 = 128$

ix. $11111111_2 : 2^7 + 2^6 + 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0 = 255$

x. $11010111_2 : 2^7 + 2^6 + 0^5 + 2^4 + 0^3 + 2^2 + 2^1 + 2^0 = 215$

B

i. $7_{10} = 111_2$

ii. $10_{10} = 1010_2$

iii. $33_{10} = 100001_2$

iv. $50_{10} = 110010_2$

v. $96_{10} = 1100000_2$

vi. $108_{10} = 1101100_2$

vii. $214_{10} = 11010110_2$

viii. $15_{10} = 1111_2$

ix. $71_{10} = 1000111_2$

x. $146_{10} = 10010010_2$

C

1.
$$\begin{array}{r} 1 \\ +\ 1 \\ \hline 1\,0 \end{array}$$

2.
$$\begin{array}{r} 1\,1 \\ +1\,0 \\ \hline 1\,0\,1 \end{array}$$

3.
$$\begin{array}{r} 1\,1\,0 \\ +0\,1\,1 \\ \hline 1\,0\,0\,1 \end{array}$$

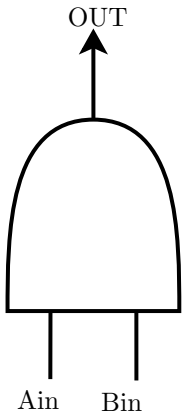
4.
$$\begin{array}{r} 1\,1\,0\,1 \\ +\,1\,0\,1\,1 \\ \hline 1\,1\,0\,0\,0 \end{array}$$

5.
$$\begin{array}{r} 0\,0\,1\,0\,1 \\ +\,1\,1\,1\,1\,0 \\ \hline 1\,0\,0\,0\,1\,1 \end{array}$$

Problem 2

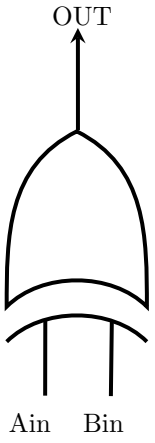
a)

A_{in}	B_{in}	$A \wedge B$
0	0	0
0	1	0
1	0	0
1	1	1



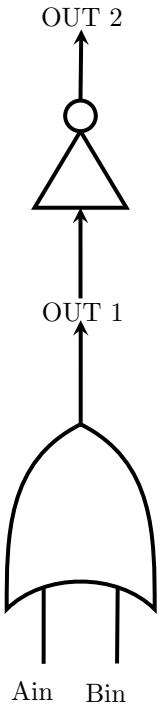
b)

A_{in}	B_{in}	$A \oplus B$
0	0	0
0	1	1
1	0	1
1	1	0



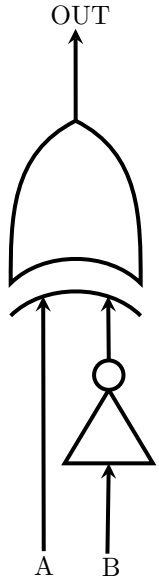
c)

A_{in}	B_{in}	$A \vee B$	$\neg(A \vee B)$
0	0	0	1
0	1	1	0
1	0	1	0
1	1	1	0



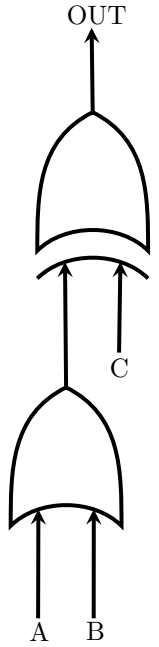
d)

A_{in}	B_{in}	$\neg B$	$A \oplus \neg B$
0	0	0	1
0	1	1	0
1	0	1	0
1	1	1	1



e)

A_{in}	B_{in}	C_{in}	$A \vee B$	$(A \vee B) \oplus C$
0	0	0	0	0
0	0	1	0	1
0	1	0	1	1
0	1	1	1	0
1	0	0	1	1
1	0	1	1	0
1	1	0	1	1
1	1	1	1	0



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