

問題 1

(a)
$$\begin{array}{r} 10110 \\ +) 110 \\ \hline 11100 // \end{array}$$

(b)
$$\begin{array}{r} 11010 \\ \rightarrow 1101 \\ \hline 1101 // \end{array}$$

(c)
$$\begin{array}{r} 1011 \\ \times) 110 \\ \hline 10110 \\ 1011 \\ \hline 1000010 // \end{array}$$

(d)
$$\begin{array}{r} 101 \\ 1001 \overline{) 101101} \\ \underline{1001} \\ 1001 \\ \underline{1001} \\ 0 \\ 101 // \end{array}$$

問題 2

(1) (a) $11_{(10)} = 01011_{(2)}$
 $\rightarrow 10100 + 1$
 $= 10101_{(2)} //$

(b) $6.375_{(10)} = 0110.011_{(2)}$
 $\rightarrow 1001.100 + 1$
 $= 1001.101_{(2)} //$

(2) (a) $1/2$

$13_{(10)} = 01101$

$-5 \rightarrow 5 = 0101 \rightarrow 1010 + 1$
 $= 1011$

$01101 \rightarrow 11011$

$$\begin{array}{r} 01101 \\ +) 11011 \\ \hline 101000 \end{array} \rightarrow 01000_{(2)} //$$

$01000_{(2)} = 8_{(10)}$

(b) $-3 \rightarrow 3 = 011 \rightarrow 100 + 1$
 $= 101 \rightarrow 11101$

$-9 \rightarrow 9 = \cancel{01001} + 1$
 $01001 \rightarrow 10110 + 1$
 $= 10111$

$$\begin{array}{r} 11101 \\ +) 10111 \\ \hline 1010100 \end{array} \rightarrow 10100_{(2)} //$$

$10100_{(2)} = -12_{(10)}$

問題 3

(a) $13_{(10)} = 01101$

$6_{(10)} = 00110$

$13 + 6$
$$\begin{array}{r} 01101 \\ +) 00110 \\ \hline 10011 // \end{array}$$

$-9 \rightarrow 9 = 01001$
 $\rightarrow 10110 + 1 = 10111$

$$\begin{array}{r} 10011 \\ +) 10111 \\ \hline 101010 \end{array} \rightarrow 01010_{(2)}$$

 $//$
 $10_{(10)}$

(b) $3_{(10)} = 0011$
 $6_{(10)} = 0110$
 $3+6$

$$\begin{array}{r} 0011 \\ + 0110 \\ \hline 1001 // \end{array}$$
 $-5 \rightarrow 5 = 0101 \rightarrow 1010 + 1$
 $= 1011$

$$\begin{array}{r} 1001 \\ + 1011 \\ \hline 1 \boxed{0100} = 0100_{(2)} \\ // \\ 4_{(10)} \end{array}$$

(b) $\rightarrow \rightarrow 3 = 011 \rightarrow (00+1)$
 $= (01 (1+2))$
 $(1+4)$ 桁
 $-3_{(10)} = 1110_{(2)}$

$$\begin{array}{r} 11101 \\ \text{①} \times \text{①} \text{ } \text{①} \text{ } \text{①} \text{ } \text{①} \\ \hline 11101 \\ \text{①} \text{ } \text{①} \text{ } \text{①} \text{ } \text{①} \\ \hline 11101 \\ \text{①} \text{ } \text{①} \text{ } \text{①} \text{ } \text{①} \\ \hline 11101 \text{①} \\ \hline 11010 \boxed{01001} \\ // \\ 0100_{(2)} \\ // \\ 9_{(10)} \end{array}$$

問題4

(a) $-5_{(10)} = 1011_{(2)} (1+3)$
 $3_{(10)} = 011_{(2)} = (1+2)$
 $(1+5)$ 桁
 $-5_{(10)} = 1011_{(2)} \rightarrow 111011_{(2)}$
 $3_{(10)} = 011 \rightarrow 000011_{(2)}$

$$\begin{array}{r} 111011 \\ \times 000011 \\ \hline 111011 \\ 111011 \\ \hline 10 \boxed{110001} \rightarrow 110001_{(2)} \\ // \\ -15_{(10)} \end{array}$$

問題5

(1) (a) $32 \times 32 \times 5 = 5120$ bit //
 (b) $2^5 = 32$ 階調 //

(2) (a) $2^3 \times 2^3 \times 2^3 = 2^9 = 512$ 色 //

(b) $16 \times (6 \times (3+3+3))$
 $= 2304$ bit //