#1. a→ $\overset{4}{7}\ \overset{3}{7}\ \overset{2}{7}\ \overset{1}{7}\ \overset{0}{7}$

12345_7

$= (7^4 \times 1) + (7^3 \times 2) + (7^3 \times 3) + (7^2 \times 4) + (7^1 \times 5)$

$= 2401 + 686 + 147 + 28 + 5$

$= 3267_{10}$

b→ $\overset{3}{16}\ \overset{2}{16}\ \overset{1}{16}\ \overset{0}{16}$

$2\ A\ A\ 3_{16}$

$= (16^3 \times 2) + (16^2 \times A) + (16^1 \times A) + (16^0 \times 3)$

$= (16^3 \times 2) + (16^2 \times 10) + (16^1 \times 10) + (16^0 \times 3)$

$= 8192 + 2560 + 160 + 3$

$= 10915_{10}$

c→ i) $\overset{1}{16}\ \overset{0}{16}$

$4B_{16} \rightarrow$ base 10

$= (16^1 \times 4) + (16^0 \times B)$

$= (16^1 \times 4) + (16^0 \times 11)$

$= 64 + 11$

$= 75_{10}$

ii) $4B_{16} \rightarrow$ base 2

$\overset{4}{\overline{\quad}}\ \overset{B}{\overline{\quad}}$

$= 0100\ 1011_2$

iii) $4B_{16} \rightarrow$ base 2 $\rightarrow$ base 8

$\overset{1}{\overline{\quad}}\ \overset{1}{\overline{\quad}}\ \overset{3}{\overline{\quad}}\ = 113_8$

$001\ 001\ 011_2$

\#1.d $\rightarrow$ 1011_{10} $\rightarrow$ base 16

$$1011 \div 16 = 63 \ (.1875 \times 16) = 3$$
$$63 \div 16 = 3 \ (.9375 \times 16) = 15$$
$$3 \div 16 = 0 \ (.1875 \times 16) = 3$$

$$= 3F3_{16}$$
$$= 001111110011_2$$

e $\rightarrow$ 0xEE $= 11101110_2$

$$= (16^1 \times 14_{10}) + (16^0 \times 14_{10})$$
$$= 224 + 14$$
$$= 238_{10}$$

\#2 $\rightarrow$ 17_{10} sur 5 bits.

$$2^4 + 2^0 \rightarrow 10001_2$$

\#3. a $\rightarrow$ 01101_2 c.à.z sur 5 bits.

$$= 2^3 + 2^2 + 2^0$$
$$= 8 + 4 + 1$$
$$= 13_{10}$$

b $\rightarrow$ 10011_2

$$= (-2^4) + (2^1) + (2^0)$$
$$= -16 + 2 + 1$$
$$= -13_{10}$$

#4. a→ 3.15_{10} → base 2

i) $3_{10} = 2^1 + 2^0 = 11_2$

ii) 0.15_{10} → base 2 $= 0.0010011001100..._2$

0.15×2
$= 0.3 \times 2$
$= 0.6 \times 2$
$= 1(.2 \times 2)$
$= 0.4 \times 2$
$= 0.8 \times 2$
$= 1.(6 \times 2)$
$= 1.(2 \times 2)$
$= 0.4 \times 2$
$= 0.8 \times 2$
$= 1.(6 \times 2)$
$= 1.(2 \times 2)$
$= 0.4 \times 2$
$= 0.8 ...$

$3.15_{10} = 11.0010011001100..._2$
$= 1.10010011001100... \times 2^1$

$e = 1 + 1023 = 1024 = 2^{10} = 10000000000$

$\underset{s}{0.}\underset{e}{\underline{10000000000}}.\underset{f}{\underline{10010011001100...}}1$

#1. a→

$$7^4 \quad 7^3 \quad 7^2 \quad 7^1 \quad 7^0$$
$$1 \quad 2 \quad 3 \quad 4 \quad 5_7$$

$$= (7^4 \times 1) + (7^3 \times 2) + (7^3 \times 3) + (7^2 \times 4) + (7^1 \times 5)$$
$$= 2401 + 686 + 147 + 28 + 5$$
$$= 3267_{10}$$

b→

$$16^3 \quad 16^2 \quad 16^1 \quad 16^0$$
$$2 \quad A \quad A \quad 3_{16}$$

$$= (16^3 \times 2) + (16^2 \times A) + (16^1 \times A) + (16^0 \times 3)$$
$$= (16^3 \times 2) + (16^2 \times 10) + (16^1 \times 10) + (16^0 \times 3)$$
$$= 8192 + 2560 + 160 + 3$$
$$= 10915_{10}$$

c→ i)

$$16^1 \quad 16^0$$
$$4B_{16} \rightarrow \text{base 10}$$

$$= (16^1 \times 4) + (16^0 \times B)$$
$$= (16^1 \times 4) + (16^0 \times 11)$$
$$= 64 + 11$$
$$= 75_{10}$$

ii) $4B_{16} \rightarrow$ base 2

$$\overbrace{}^{4} \quad \overbrace{}^{B}$$
$$= 0100 \quad 1011_2$$

iii) $4B_{16} \rightarrow$ base 2 → base 8

$$\overbrace{}^{1} \overbrace{}^{1} \overbrace{}^{3} \quad = 113_8$$
$$001 \quad 001 \quad 011_2$$

#1.d→ 1011_{10} → base 16

$$1011 \div 16 = 63 \ (.1875 \times 16) = 3$$
$$63 \div 16 = 3 \ (.9375 \times 16) = 15$$
$$3 \div 16 = 0 \ (.1875 \times 16) = 3$$

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#2 → 17_{10} sur 5 bits.

$$2^4 + 2^0 \rightarrow 10001_2$$

#3. a→ 01101_2 c.à.z sur 5 bits.

$$= 2^3 + 2^2 + 2^0$$
$$= 8 + 4 + 1$$
$$= 13_{10}$$

b→ 10011_2

$$= (-2^4) + (2^1) + (2^0)$$
$$= -16 + 2 + 1$$
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i) $3_{10} = 2^1 + 2^0 = 11_2$

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$= 1.(6 \times 2)$
$= 1.(2 \times 2)$
$= 0.4 \times 2$
$= 0.8 ...$

$3.15_{10} = 11.0010011001100..._2$
$\quad\quad = 1.10010011001100... \times 2^1$

$e = 1 + 1023 = 1024 = 2^{10} = 10000000000$

$\underbrace{0}_{S} \underbrace{.10000000000}_{e} \underbrace{.10010011001100...}_{f}]$