I ① 13, 17

$(13)_{10} \longrightarrow (1101)_2$

$(17)_{10} \longrightarrow (10001)_2$

$\overset{16\ 8\ 4\ 2}{(11110)_2} \longrightarrow (30)_{10}$

$$\begin{array}{r} 1 \\ 1101 \\ 10001 \\ \hline 11110 \end{array}$$

② 32, 16

$32 \longrightarrow$

$16 \longrightarrow$

$(100000)_2$

2	2	2	2	2	2
0	1	2	4	8	16	32
1	0	0	0	0	0

$16 \longrightarrow$

$(10000)_2$

2	2	2	2	2	2
0	1	2	4	8	16
	1	0	0	0	0

$$\begin{array}{r} 100000 \\ 10000 \\ \hline 110000 \end{array}$$

$\overset{32\ 16}{(110000)_2} \longrightarrow (48)_{10}$

(iii) 74, 47

74 →

	2	2	2	2	2	2	2
0	1	2	4	9	18	37	74
	1	0	0	1	0	1	0

$(1001010)_2$

		2	2	2	2	2	2
	0	1	2	5	11	23	47
	0	0	1	1	1	1	1

$(101111)_2$

$$1001010$$
$$101111$$
$$\overline{\underset{64\ 32\ 8\ 8}{1111001}} \longrightarrow 121$$

(iv) 3, 100

100 →

2	2	2	2	2	2	2
1	3	6	12	25	50	100
1	1	0	0	1	0	0

$(1100100)_2$

$3 \rightarrow$

			2	2
		0	1	3
			1	1

$(11)_2$

$$1100100$$
$$11$$
$$\overline{\underset{64\ 32\ 4\ 2\ 1}{1100111}} \longrightarrow 103$$

2. ① 000 111 → 111 001

② 10 10 10 → 0 10 110

③ 111 111 → 000 001

④ 1 000 00 → 1 0000 0

---

3. ① 1 00 111 → 2's complement
   11 0 01 → -25
   3616 8   1

② 1 01 01 0 → 2's complement
   11 01 10 → - 22

③ 0 111 11 → 2's complement
   0 00001 → +1

④ 1 00 000 → -0

---

4. ① 000 11000
   0 100 1001   [Not over Flow]
   _____
   0 11 00001

② 10 10 1000
   1 0001000 0   [over Flow]
   _____
   1 00 11 0000

③ 111 11 000
   1011 0110   [over Flow]
   _____
   11 0 11 0110

④ 111 00 111
   0 111 1000   [over Flow]
   _____
   1 0 10 11 111

⑤ grey code

```
0   0   0  | 0
0   0   1  | 1
0   1   1  | 3
0   1   0  | 2
1   0   0  | 6
1   0   1  | 7
1   1   1  | 5
1   1   0  | 4
```

⑥ ⓘ 0 0011000

→ BCD   hex: 18

    18

ⓘⓘ 10101000 → No proper   hex: A8

    10 8

ⓘⓘⓘ 1111 1000 → No proper   hex: F8

    15   8

ⓘⓥ 0110 0111 → No proper   hex: 67

    6   7