

$$1.3 \text{ a) } (37644)_8 = (16292)_{10}$$

$$3 \cdot 8^4 + 7 \cdot 8^3 + 6 \cdot 8^2 + 4 \cdot 8^1 + 4 \cdot 8^0 = 16292$$

$$(16292)_{10} = (3FA4)_{16}$$

$$16292 : 16 = 1018 \quad R4$$

$$1018 : 16 = 63 \quad RA$$

$$63 : 16 = 3 \quad RF$$

$$3 : 16 = 0 \quad R3$$

$$b) \text{ i) } (35)_{10} = (100011)_2$$

8-stellig: 00100011

$$35 : 2 = 17 \quad R1$$

$$17 : 2 = 8 \quad R1$$

$$8 : 2 = 4 \quad R0$$

$$4 : 2 = 2 \quad R0$$

$$2 : 2 = 1 \quad R0$$

$$1 : 2 = 0 \quad R1$$

1-Komplement:

VZ: Positiv 11011100 Betrag: 220

2-Komplement:

(11011101)<sub>2K</sub>

VZ: Negativ Betrag: 35

$$\text{ii) } (-21)_{10} = -(10101)_2 = (11101011)_{2K}$$

$$21 : 2 = 10 \quad R1$$

$$10 : 2 = 5 \quad R0$$

$$5 : 2 = 2 \quad R1$$

$$2 : 2 = 1 \quad R0$$

$$1 : 2 = 0 \quad R1$$

1-Komplement:

01101010

2-Komplement:

(111101011)<sub>2K</sub>

VZ: Negativ Betrag: 21

$$\text{iii) } (64)_{10} = (1000000)_2$$

8-stellig: 01000000

$$64 : 2 = 32 \quad R0$$

$$32 : 2 = 16 \quad R0$$

$$16 : 2 = 8 \quad R0$$

$$8 : 2 = 4 \quad R0$$

$$4 : 2 = 2 \quad R0$$

$$2 : 2 = 1 \quad R0$$

$$1 : 2 = 0 \quad R1$$

1-Komplement:

10111111

2-Komplement:

(111000000)<sub>2K</sub>

VZ: Negativ Betrag: 64

$$\text{iv) } (-126)_{10} = -(1111110)_2$$

$$126 : 2 = 63 \text{ R0}$$

$$63 : 2 = 31 \text{ R1}$$

$$31 : 2 = 15 \text{ R1}$$

$$15 : 2 = 7 \text{ R1}$$

$$7 : 2 = 3 \text{ R1}$$

$$3 : 2 = 1 \text{ R1}$$

$$1 : 2 = 0 \text{ R1}$$

8-stellig: 01111110

1-Komplement:

10000001

2-Komplement:

(110000010)<sub>2K</sub>

VZ: Negativ Betrag: 126

$$\text{c) i) } (37)_{10} = (100101)_2$$

$$37 : 2 = 18 \text{ R1}$$

$$18 : 2 = 9 \text{ R0}$$

$$9 : 2 = 4 \text{ R1}$$

$$4 : 2 = 2 \text{ R0}$$

$$2 : 2 = 1 \text{ R0}$$

$$1 : 2 = 0 \text{ R1}$$

$$(16)_{10} = (10000)_2$$

$$16 : 2 = 8 \text{ R0}$$

$$8 : 2 = 4 \text{ R0}$$

$$4 : 2 = 2 \text{ R0}$$

$$2 : 2 = 1 \text{ R0}$$

$$1 : 1 = 0 \text{ R1}$$

$$\begin{array}{l} (0 | 100101)_{2K} \\ (0 | 10000)_{2K} \end{array}$$

$$(0 | 110101)_{2K}$$

$$1 \cdot 2^5 + 1 \cdot 2^4 + 1 \cdot 2^2 + 1 \cdot 2^0 = (53)_{10}$$

$$\text{ii) } (-12)_{10} = -(1100)$$

$$12 : 2 = 6 \text{ R0}$$

$$6 : 2 = 3 \text{ R0}$$

$$3 : 2 = 1 \text{ R1}$$

$$1 : 2 = 0 \text{ R1}$$

$$(11)_{10} = (1011)_2$$

$$11 : 2 = 5 \text{ R1}$$

$$5 : 2 = 2 \text{ R1}$$

$$2 : 2 = 1 \text{ R0}$$

$$1 : 2 = 0 \text{ R1}$$

$$\begin{array}{l} (1 | 0100)_{2K} \\ (0 | 1011)_{2K} \end{array}$$

$$(111111)_{2K}$$

~~11111111~~

$$-(1 \cdot 2^4) + 1 \cdot 2^3 + 1 \cdot 2^2 + 1 \cdot 2^1 + 1 \cdot 2^0$$

$$= -1$$