

Exercise 1 Answers

1.

- a. 19_{10}
- b. 13_{10}
- c. 142_{10}
- d. 221_{10}
- e. 431_{10}
- f. 341_{10}
- g. -13_{10}
- h. 15_{10}
- i. -83_{10}
- j. 107_{10}
- k. -225_{10}
- l. 219_{10}

2.

- a. $01001_2, 00001001_2, 000001001_2, 09_{16}, 09_{16}, 009_{16}$
- b. $10011_2, 00010011_2, 000010011_2, 13_{16}, 13_{16}, 013_{16}$
- c. Not. Poss., $00101101_2, 000101101_2, \text{NA}, 2D_{16}, 02D_{16}$
- d. Not. Poss., $01000011_2, 001000011_2, \text{NA}, 43_{16}, 043_{16}$
- e. Not. Poss., $01011000_2, 001011000_2, \text{NA}, 58_{16}, 058_{16}$
- f. Not. Poss., Not Poss., Not Poss., NA, NA, NA
- g. Not. Poss., $01111100_2, 001111100_2, \text{NA}, 7C_{16}, 07C_{16}$
- h. Not. Poss., $11001001_2, 011001001_2, \text{NA}, C9_{16}, 0C9_{16}$
- i. Not. Poss., Not. Poss., $100101100_2, \text{NA}, \text{NA}, 12C_{16}$
- j. Not. Poss., Not. Poss., $110010101_2, \text{NA}, \text{NA}, 195_{16}$

3.

- a. 10100_{2c} , 11110100_{2c} , 111110100_{2c} , 14_{16} , $F4_{16}$, $1F4_{16}$
- b. 10111_{2c} , 11110111_{2c} , 111110111_{2c} , 17_{16} , $F7_{16}$, $1F7_{16}$
- c. 01011_{2c} , 00001011_{2c} , 000001011_{2c} , $0B$, $0B_{16}$, $00B_{16}$
- d. Not. Poss., 11001110_{2c} , 111001110_{2c} , NA, CE_{16} , $1CE_{16}$
- e. Not. Poss., 10011101_{2c} , 110011101_{2c} , NA, $9D_{16}$, $19D_{16}$
- f. Not. Poss., 01001110_{2c} , 001001110_{2c} , NA, $4E_{16}$, $04E_{16}$
- g. Not. Poss., Not Poss., 010000010_{2c} , NA, NA, 082_{16}
- h. Not. Poss., 01100111_{2c} , 001100111_{2c} , NA, 67_{16} , 067_{16}
- i. Not. Poss., Not. Poss., 100010111_{2c} , NA, NA, 117_{16}
- j. Not. Poss., Not Poss., Not Poss., NA, NA, NA

4.

- a. $1B_{16}$
- b. $2D_{16}$
- c. $3A_{16}$
- d. 53_{16}
- e. 78_{16}
- f. $B4_{16}$
- g. $D2_{16}$
- h. EB_{16}
- i. FO_{16}
- j. FF_{16}

5.

a. 5-bit unsigned binary

i. 10_{10} , 01010_2

ii. 31_{10} , 11111_2

iii. 14_{10} , 01110_2

iv. 23_{10} , 10111_2

b. 8-bit unsigned binary

i. 237_{10} , 11101101_2

ii. 143_{10} , 10001111_2

iii. 180_{10} , 10110100_2

iv. 106_{10} , 01101010_2

c. 9-bit unsigned binary

i. 167_{10} , 010100111_2

ii. 121_{10} , 001111001_2

iii. 257_{10} , 100000001_2

iv. 341_{10} , 101010101_2

d. 5-bit signed binary

i. 10_{10} , 01010_{2c}

ii. -6_{10} , 11010_{2c}

iii. -1_{10} , 11111_{2c}

iv. 8_{10} , 01000_{2c}

e. 8-bit signed binary

i. -82_{10} , 10101110_{2c}

ii. 127_{10} , 01111111_{2c}

iii. 93_{10} , 01011101_{2c}

iv. -52_{10} , 11001100_{2c}

f. 9-bit signed binary

i. 174_{10} , 010101110_{2c}

ii. -82_{10} , 110101110_{2c}

iii. 138_{10} , 010001010_{2c}

iv. -1_{10} , 111111111_{2c}

6.

- a. 11111_{2C}
- b. 01101_{2C}
- c. 10011_{2C}
- d. 11001011_{2C}
- e. 10111000_{2C}
- f. 00000000_{2C}
- g. 011011000_{2C}
- h. 100001001_{2C}
- i. 10000000_{2C} , invalid
- j. Can't negate unsigned

7.

- a. $0000\ 0000\ 0000\ 1001_2$, 0009_{16}
- b. $0000\ 0000\ 0001\ 0111_2$, 0017_{16}
- c. $1111\ 1111\ 1111\ 0111_{2c}$, $FFF7_{16}$
- d. $0000\ 0000\ 0011\ 0101_2$, 0035_{16}
- e. $0000\ 0000\ 0011\ 0101_{2c}$, 0035_{16}
- f. $0000\ 0000\ 1011\ 0011_2$, $00B3_{16}$
- g. $1111\ 1111\ 0001\ 0011_{2c}$, $FF13_{16}$
- h. $0000\ 0000\ 1101\ 1100_{2c}$, $00DC_{16}$

8.

- a. 11011_2 , 00011011_2 , 000011011_2
- b. Not Valid , 11100111_{2c} , 111100111_{2c}
- c. Not Valid, 10111000_{2c} , 110111000_{2c}
- d. Not Valid, Not Valid, 010100011_{2c}
- e. Not Valid, Not Valid, Not Valid

9.

- a. 11101_2 , no overflow
- b. 10010_2 , overflow
- c. 10111_{2c} , no overflow
- d. 10010_{2c} , overflow
- e. 10011_{2c} , no overflow
- f. 10111_{2c} , overflow
- g. 00000110_2 , overflow
- h. 10110000_2 , no overflow
- i. 10011011_{2c} , no overflow
- j. 00110100_{2c} , no overflow
- k. 11111110_2 , overflow
- l. 00111110_2 , no overflow
- m. 00111110_{2c} , overflow
- n. 11101010_{2c} , no overflow
- o. 11000000_{2c} , overflow
- p. 11100000_{2c} , no overflow
- q. 11010100_2 , no overflow
- r. 01011000_2 , no overflow
- s. 01101111_{2c} , no overflow
- t. 11101111_{2c} , no overflow