

Send ERSOY

040200434

EEF205E - HW1

CRN: 10093

1. Convert the hexadecimal number 64CD to binary, to octal and decimal

$$64CD \rightarrow 6 \times 16^3 + 4 \times 16^2 + 12 \times 16 + 13 \times 16^0 = (25805)_{10}$$

$$\begin{array}{r} 25805 \div 8 = 3225 \text{ R } 5 \\ 3225 \div 8 = 403 \text{ R } 1 \\ 403 \div 8 = 50 \text{ R } 3 \\ 50 \div 8 = 6 \text{ R } 2 \end{array}$$

$(62315)_8$

$$\begin{array}{r} 25805 \div 2 = 12902 \text{ R } 1 \\ 12902 \div 2 = 6451 \text{ R } 0 \\ 6451 \div 2 = 3225 \text{ R } 1 \\ 3225 \div 2 = 1612 \text{ R } 1 \\ 1612 \div 2 = 806 \text{ R } 0 \\ 806 \div 2 = 403 \text{ R } 0 \\ 403 \div 2 = 201 \text{ R } 1 \\ 201 \div 2 = 100 \text{ R } 1 \\ 100 \div 2 = 50 \text{ R } 0 \\ 50 \div 2 = 25 \text{ R } 0 \\ 25 \div 2 = 12 \text{ R } 1 \\ 12 \div 2 = 6 \text{ R } 0 \\ 6 \div 2 = 3 \text{ R } 0 \\ 3 \div 2 = 1 \text{ R } 1 \end{array}$$

OR

$(6)_{16} = (0110)_2$
 $(4)_{16} = (0100)_2$
 $(C)_{16} = (1100)_2$
 $(D)_{16} = (1101)_2$

$(110010011001101)_2$

2. Convert the decimal number 431 to binary, hexadecimal and octal.

$$\begin{array}{r} 431 \div 2 = 215 \text{ R } 1 \\ 215 \div 2 = 107 \text{ R } 1 \\ 107 \div 2 = 53 \text{ R } 1 \\ 53 \div 2 = 26 \text{ R } 1 \\ 26 \div 2 = 13 \text{ R } 0 \\ 13 \div 2 = 6 \text{ R } 1 \\ 6 \div 2 = 3 \text{ R } 0 \\ 3 \div 2 = 1 \text{ R } 1 \end{array}$$

$(110101111)_2$

$(110)_2 = (6)_8$

$(101)_2 = (5)_8$

$(111)_2 = (7)_8$

$(657)_8$

$(0001)_2 = (1)_{16}$

$(1010)_2 = (A)_{16}$

$(1111)_2 = (F)_{16}$

$(1AF)_{16}$

3. Express the following numbers in decimal

a.

$$(10110.0101)_2$$

$$(22.3125)_{10} = 1 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0 + 0 \times 2^{-1} + 1 \times 2^{-2} + 0 \times 2^{-3} + 1 \times 2^{-4}$$

b.

$$(16.5)_{16}$$

$$(0001)_2 \quad (0110)_2 \cdot (0101)_2$$

$$10110.0101$$

$$16 + 4 + 2 + 0.25 + 0.0625 = (22.3125)_{10}$$

c.

$$(26.24)_8$$

$$010 \quad 110 \cdot 010 \quad 100$$

$$(10110.0101)_2$$

$$= (22.3125)_{10}$$

d.

$$(DADA.B)_{16}$$

$$13 \times 16^3 + 10 \times 16^2 + 13 \times 16^1 + 10 \times 16^0 + 11 \times 16^{-1} = (56026.6875)_{10}$$

e.

$$(1010.1101)_2$$

$$(10,8125)_{10} = 2^3 + 0 + 2^1 + 0 + 2^{-1} + 2^{-2} + 0 + 2^{-4}$$

4. Convert the following binary numbers to hex and to decimal

a.

$$(1.10010)_2$$

$$(1)_{16} \quad (9)_{16} \quad (1.9)_{16}$$

$$1 \times 2^0 + 1 \times 2^{-1} + 1 \times 2^{-4} = (1.5625)_{10}$$

b.

$$(110.010)_2$$

$$(6)_{16} \quad (4)_{16} \quad (6.4)_{16}$$

$$1 \times 2^2 + 1 \times 2^1 + 1 \times 2^{-2} = (6.25)_{10}$$

Fraction point in b is two digit right than a, meaning that there are two more digit multiplication. Because we are working with binary numbers, we multiply with 2 twice.

X	Y	Z	$F(X, Y, Z)$
0	0	0	0
0	0	1	1
0	1	0	1
1	0	0	0
0	1	1	1
1	1	0	0
1	0	1	1
1	1	1	1