

Homework 1

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Question 1

1.1 A

Convert the following numbers to their decimal representation. Show your work.

1. $10011011_2 = 1 \times 2^0 + 1 \times 2^1 + 1 \times 2^3 + 1 \times 2^3 + 1 \times 2^4 + 1 \times 2^7 = (155)_{10}$

2. $456_7 = 6 \times 7^0 + 5 \times 7^1 + 4 \times 7^2 = (237)_{10}$

3. $38A_{16} = 10 \times 16^0 + 8 \times 16^1 + 3 \times 16^2 = (906)_{10}$

4. $2214_5 = 4 \times 5^0 + 1 \times 5^1 + 2 \times 5^2 + 2 \times 5^3 = (309)_{10}$

1.2 B

Convert the following numbers to their binary representation:

1. $69_{10} = 2^6 + 2^2 + 2^0 = (1000101)_2$

2. $485_{10} = 2^8 + 2^7 + 2^6 + 2^5 + 2_2 + 2_0 = (111100101)_2$

3. $6D1A_{16} = 0110110100011010_2$ (Hexadecimal to Binary Table)

1.3 C

Convert the following numbers to their hexadecimal representation:

1. $1101011_2 = (6B)_{16}$

2. $895_{10} = (37F)_{16}$

Question 2

Solve the following, do all calculation in the given base. Show your work.

1. $7566_8 + 4515_8 = (14303)_8$

$$\begin{array}{r} 7^1 5^1 6^1 6_8 \\ + 4^1 5^1 1^1 5_8 \\ \hline 1^1 4^1 3^1 0^1 3_8 \end{array}$$

2. $10110011_2 + 1101_2 = (11000000)_2$

$$\begin{array}{r} 1^1 0^1 1^1 1^1 0^1 0^1 1^1 1_2 \\ + 1^1 1^1 0^1 1_2 \\ \hline 1^1 1^1 0^1 0^1 0^1 0^1 0^1 0_2 \end{array}$$

3. $7A66_{16} + 45C5_{16} = C02B_{16}$

$$\begin{array}{r} 7^1 A^1 6^1 6_{16} \\ + 4^1 5^1 C^1 5_{16} \\ \hline C^1 0^1 2^1 B_{16} \end{array}$$

4. $3022_5 + 2433_5 = (34)_5$

$$\begin{array}{r} 3^2 0^1 2^1 2^1_5 \\ + 2^1 4^1 3^1 3_5 \\ \hline 0^1 0^1 3^1 4_5 \end{array}$$

