

Number systems

1. Expand the following decimal number: 5130_{10} .

2. Convert the following binary numbers to their decimal equivalents:

a) 1100110_2 ; 10_2

b) 1111100_2 .

3. Convert the following decimal numbers to their binary equivalents:

a) 49_{10} ;

b) 21_{10} .

4. Perform the following binary additions:

$$\begin{array}{r} \text{(a)} \quad 1 \ 0 \ 0 \ 1 \\ + \quad 1 \ 1 \ 0 \ 0 \\ \hline \end{array} \quad \begin{array}{r} \text{(b)} \quad 1 \ 1 \ 1 \ 0 \\ + \quad 1 \ 1 \ 0 \ 1 \\ \hline \end{array} \quad \begin{array}{r} \text{(c)} \quad 1 \ 0 \ 1 \ 0 \ 1 \\ + \quad 0 \ 0 \ 1 \ 1 \ 1 \\ \hline \end{array} \quad \begin{array}{r} \text{(d)} \quad 1 \ 1 \ 0 \ 1 \ 1 \ 0 \\ + \quad 1 \ 1 \ 1 \ 0 \ 1 \ 1 \\ \hline \end{array}$$

5. Solve the following subtraction problems using the complement method:

a) $5086 - 2993 =$;

b) $8391 - 255 =$.

6. Solve the following binary subtraction problems using the complement method:

a) $11001101_2 - 10101010_2 =$;

b) $100100_2 - 11101_2 =$.

7. Convert the following octal numbers to their decimal equivalents:

a) 536_8 ;

b) 1163_8 .

8. Convert the following decimal numbers to their octal equivalents:

a) 3002_{10} ;

b) 6512_{10} .

9. Perform the following octal additions:

$$\begin{array}{r} \text{(a)} \quad 5 \quad 4 \quad 3 \quad 0 \\ + \quad 3 \quad 2 \quad 4 \quad 1 \\ \hline \end{array} \quad \begin{array}{r} \text{(b)} \quad 6 \quad 4 \quad 0 \quad 5 \\ + \quad 1 \quad 2 \quad 3 \quad 4 \\ \hline \end{array}$$

10. Solve the following octal subtraction problems using the complement method:

a) $6776_8 - 4337_8 =$;

b) $5434_8 - 3556_8 =$.

11. Convert the following hexadecimal numbers to their decimal equivalents:

a) $243F_{16}$;

b) $BEEF_{16}$.