

۱- اعداد زیر را از مبنای ده به مبنای ۲ تبدیل کنید

a) $37 = (100101)_2$

$$\begin{array}{r} 37 \div 2 = 18 \text{ remainder } 1 \\ 18 \div 2 = 9 \text{ remainder } 0 \\ 9 \div 2 = 4 \text{ remainder } 1 \\ 4 \div 2 = 2 \text{ remainder } 0 \\ 2 \div 2 = 1 \text{ remainder } 0 \\ 1 \div 2 = 0 \text{ remainder } 1 \end{array}$$

b) $(91)_{10} = (1011011)_2$

$$\begin{array}{r} 91 \div 2 = 45 \text{ remainder } 1 \\ 45 \div 2 = 22 \text{ remainder } 1 \\ 22 \div 2 = 11 \text{ remainder } 0 \\ 11 \div 2 = 5 \text{ remainder } 1 \\ 5 \div 2 = 2 \text{ remainder } 1 \\ 2 \div 2 = 1 \text{ remainder } 0 \\ 1 \div 2 = 0 \text{ remainder } 1 \end{array}$$

c) $(145)_{10} = (10010001)_2$

$$\begin{array}{r} 145 \div 2 = 72 \text{ remainder } 1 \\ 72 \div 2 = 36 \text{ remainder } 0 \\ 36 \div 2 = 18 \text{ remainder } 0 \\ 18 \div 2 = 9 \text{ remainder } 0 \\ 9 \div 2 = 4 \text{ remainder } 1 \\ 4 \div 2 = 2 \text{ remainder } 0 \\ 2 \div 2 = 1 \text{ remainder } 0 \\ 1 \div 2 = 0 \text{ remainder } 1 \end{array}$$

d) $(263)_{10} = (100000111)_2$

$$\begin{array}{r} 263 \div 2 = 131 \text{ remainder } 1 \\ 131 \div 2 = 65 \text{ remainder } 1 \\ 65 \div 2 = 32 \text{ remainder } 1 \\ 32 \div 2 = 16 \text{ remainder } 0 \\ 16 \div 2 = 8 \text{ remainder } 0 \\ 8 \div 2 = 4 \text{ remainder } 0 \\ 4 \div 2 = 2 \text{ remainder } 0 \\ 2 \div 2 = 1 \text{ remainder } 0 \\ 1 \div 2 = 0 \text{ remainder } 1 \end{array}$$

۲- اعداد زیر را از مبنای ۲ (Binary) به مبنای ۱۰ (decimal) تبدیل کنید

a) $(100100)_2 = 1 \times 2^5 + 0 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 0 \times 2^0 = 32 + 4 = (36)_{10}$

b) $(11101101)_2 = 1 \times 2^7 + 1 \times 2^6 + 1 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 = 128 + 64 + 32 + 0 + 8 + 4 + 1 = (237)_{10}$

$$c) (00110010)_2 = 32 + 16 + 2 = (50)_{10}$$

$$d) (11001101)_2 = 256 + 128 + 8 + 4 + 1 = (397)_{10}$$

$$\begin{array}{r} \text{Carry in} \\ 101001 \\ + 000011 \\ \hline 101100 \end{array}_2$$

$$\begin{array}{r} 1010110 \\ + 0100111 \\ \hline 1011101 \end{array}_2$$

نہ حاصل جمع کی بائیں زمرہ کا حصہ کہیں۔

$$\begin{array}{r} \text{Carry} \\ 110011 \\ + 1100101 \\ \hline 11001100 \end{array}$$