



① A) DEC \rightarrow BIN

98₍₁₀₎ 128 64 32 16 8 4 2 1



1 1 0 0 0 1 0

1100010₍₂₎

56₍₁₀₎ \rightarrow 111000₍₂₎

64 32 16 8 4 2 1
1 1 1 0 0 0

31₍₁₀₎ \rightarrow 011111₍₂₎

32 16 8 4 2 1
0 1 1 1 1 1

32₍₁₀₎ \rightarrow 100000₍₂₎

32 16 8 4 2 1
1 0 0 0 0 0

2₍₁₀₎ \rightarrow 10₍₂₎

1000₍₁₀₎ \rightarrow

512 256 128 64 32 16 8 4 2 1
1 1 1 1 1 0 1 0 0 0

1111101000₍₂₎

111₍₁₀₎ \rightarrow 110111₍₂₎

64 32 16 8 4 2 1
1 1 0 1 1 1 1

45₍₁₀₎ \rightarrow 101101₍₂₎

32 16 8 4 2 1
1 0 1 1 0 1

$$14825_{(10)} \rightarrow 11100111101001_{(2)} \quad (2)$$

14825:2	1
7412:2	0
3706:2	0
1853:2	1
926:2	0
463:2	1
231:2	1
115:2	1
57:2	1
28:2	0
14:2	0
7:2	1
3:2	1
1:2	1
0	0



Integrated Micro-Electronics
BULGARIA

B) BIN \rightarrow DEC

$$10_{(2)} \rightarrow 2_{(10)}$$

$$\begin{array}{r} 16 \ 8 \ 4 \ 2 \ 1 \\ 1 \ 1 \ 1 \ 0 \ 1 \end{array}_{(2)} \rightarrow 29_{(10)}$$

$$\begin{array}{r} 8 \ 4 \ 2 \ 1 \\ 1 \ 1 \ 1 \ 1 \end{array}_{(2)} \rightarrow 15_{(10)}$$

$$\begin{array}{r} 16 \ 8 \ 4 \ 2 \ 1 \\ 1 \ 1 \ 1 \ 1 \ 0 \end{array}_{(2)} \rightarrow 30_{(10)}$$

$$\begin{array}{r} 16 \ 8 \ 4 \ 2 \ 1 \\ 1 \ 1 \ 0 \ 1 \ 1 \end{array}_{(2)} \rightarrow 27_{(10)}$$

$$\begin{array}{r} 8 \ 4 \ 2 \ 1 \\ 1 \ 0 \ 0 \ 1 \end{array}_{(2)} \rightarrow 9_{(10)}$$

$$\begin{array}{r} 64 \ 32 \ 16 \ 8 \ 4 \ 2 \ 1 \\ 1 \ 1 \ 1 \ 0 \ 1 \ 1 \ 1 \end{array}_{(2)} \rightarrow 119_{(10)}$$

$$\begin{array}{r} 128 \ 64 \ 32 \ 16 \ 8 \ 4 \ 2 \ 1 \\ 1 \ 1 \ 0 \ 0 \ 1 \ 1 \ 0 \ 0 \end{array}_{(2)} \rightarrow 204_{(10)}$$

$$\begin{array}{r} 256 \ 128 \ 64 \ 32 \ 16 \ 8 \ 4 \ 2 \ 1 \\ 1 \ 0 \ 1 \ 0 \ 1 \ 0 \ 1 \ 0 \end{array}_{(2)} \rightarrow 342_{(10)}$$

$$\begin{array}{r} 512 \ 256 \ 128 \ 64 \ 32 \ 16 \ 8 \ 4 \ 2 \ 1 \\ 1 \ 0 \ 1 \ 0 \ 1 \ 0 \ 1 \ 0 \end{array}_{(2)} \rightarrow 682_{(10)}$$

3) 540

C) DEC \rightarrow HEX

$$48_{(10)} \xrightarrow{\begin{smallmatrix} 32 & 16 & 8 & 4 & 2 & 1 \\ 1 & 1 & 0 & 0 & 0 & 0 \end{smallmatrix}} 110000_{(2)} \rightarrow 30_{(16)}$$

$$156_{(10)} \xrightarrow{\begin{smallmatrix} 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 1 & 0 & 0 & 1 & 1 & 1 & 0 & 0 \end{smallmatrix}} 10011100_{(2)} \rightarrow 9C_{(16)}$$

$$321_{(10)} \xrightarrow{\begin{smallmatrix} 256 & 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 1 & 0 & 1 & 0 & 0 & 0 & 0 & 1 & 1 \end{smallmatrix}} 101000001_{(2)} \rightarrow 141_{(16)}$$

$$255_{(10)} \xrightarrow{\begin{smallmatrix} 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \end{smallmatrix}} 11111111_{(2)} \rightarrow \text{FF}_{(16)}$$

$$1024_{(10)} \xrightarrow{\begin{smallmatrix} 1024 & 512 & 256 & 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{smallmatrix}} 1000000000_{(2)} \rightarrow 400_{(16)}$$

$$8_{(10)} \xrightarrow{\begin{smallmatrix} 8 \\ 1 & 0 & 0 & 0 \end{smallmatrix}} 1000_{(2)} \rightarrow 8_{(16)}$$

$$100_{(10)} \xrightarrow{\begin{smallmatrix} 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 1 & 1 & 0 & 0 & 1 & 0 & 0 \end{smallmatrix}} 1100100_{(2)} \rightarrow 64_{(16)}$$

$$14567_{(10)} \xrightarrow{\begin{smallmatrix} 8192 & 4096 & 2048 & 1024 & 512 & 256 & 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 1 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 1 \end{smallmatrix}} 11100011100111_{(2)} \rightarrow 38E7_{(16)}$$

$$2020_{(10)} \xrightarrow{\begin{smallmatrix} 1024 & 512 & 256 & 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 1 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 0 & 0 & 0 \end{smallmatrix}} 1111100100_{(2)} \rightarrow 7E4_{(16)}$$



D) HEX \rightarrow DEC

$$A_{(16)} \rightarrow 10_{(10)}$$

$$100_{(16)} \rightarrow 256_{(10)}$$

$$3E_{(16)} \rightarrow 62_{(10)}$$

$$1EA_{(16)} \rightarrow 256 \cdot 1 + 14 \cdot 16 + 10 \cdot 1 = 490_{(10)}$$

$$ABC_{(16)} \rightarrow 256 \cdot 10 + 16 \cdot 11 + 1 \cdot 12 = 2748_{(10)}$$

$$EF_{(16)} \rightarrow 14 \cdot 16 + 15 \cdot 1 = 239_{(10)}$$

$$5B3_{(16)} \rightarrow 5 \cdot 256 + 11 \cdot 16 + 3 \cdot 1 = 1459_{(10)}$$

$$14C_{(16)} \rightarrow 1 \cdot 256 + 4 \cdot 16 + 12 \cdot 1 = 332_{(10)}$$

$$2A2B_{(16)} \rightarrow 2 \cdot 4096 + 10 \cdot 256 + 2 \cdot 16 + 11 \cdot 1 = 10735_{(10)}$$

HEX \rightarrow BIN

$$B_{(16)} \rightarrow \begin{matrix} 8 & 4 & 2 & 1 \\ 1 & 0 & 1 & 1 \end{matrix} (2)$$

$$200_{(16)} \rightarrow \begin{matrix} 8 & 4 & 2 & 1 \\ 0 & 0 & 1 & 0 \end{matrix} \underbrace{0000}_{(2)} \underbrace{0000}_{(2)}$$

$$3E_{(16)} \rightarrow \begin{matrix} 8 & 4 & 2 & 1 & 8 & 4 & 2 & 1 \\ 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 \end{matrix} (2)$$

$$1EA_{(16)} \rightarrow \begin{matrix} 8 & 4 & 2 & 1 & 8 & 4 & 2 & 1 & 8 & 4 & 2 & 1 \\ 1 & 1 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 1 & 0 & 1 \end{matrix} (2)$$

$$CAB_{(16)} \rightarrow \begin{matrix} 8 & 4 & 2 & 1 \\ 1 & 1 & 0 & 0 & 1 & 0 & 1 & 0 & 1 & 0 & 1 & 1 \end{matrix} (2)$$

$$ED_{(16)} \rightarrow \begin{matrix} 8 & 4 & 2 & 1 \\ 1 & 1 & 1 & 0 & 1 & 1 & 0 & 1 \end{matrix} (2)$$

$$7B3_{(16)} \rightarrow 011110110011(2)$$

$$24C_{(16)} \rightarrow 001001001100(2)$$



$$3A2D_{(16)} \rightarrow 0011\ 1010\ 0010\ 1101_2$$

F) BIN \rightarrow HEX

$$\overset{4\ 2\ 1}{110}_2 \rightarrow 6_{(16)}$$

$$\overset{4\ 2\ 1\ 8\ 4\ 2\ 1}{1100101}_2 \rightarrow 65_{(16)}$$

$$\overset{2\ 1\ 8\ 4\ 2\ 1}{110011}_{(10)} \rightarrow 93_{(16)}$$

$$\overset{1\ 8\ 4\ 2\ 1\ 8\ 4\ 2\ 1}{101110110}_2 \rightarrow 176_{(16)}$$

$$\overset{8\ 4\ 2\ 1}{1011}_2 \rightarrow B_{(16)}$$

$$\overset{2\ 1\ 8\ 4\ 2\ 1}{111101}_2 \rightarrow 3D_{(16)}$$

$$\overset{8\ 4\ 2\ 1\ 8\ 4\ 2\ 1}{11001011}_2 \rightarrow CB_{(16)}$$

10 11 12 13 14 15
A B C D E F

$$\begin{array}{ccccccc} 2 & 1 & 8 & 4 & 2 & 1 & \\ 10 & 1 & 1 & 0 & 0 & 1 & 2 \end{array} \rightarrow 2C(16)$$

$$\begin{array}{ccccccc} 2 & 1 & 8 & 4 & 2 & 1 & 8 & 4 & 2 & 1 \\ 10 & 10 & 1 & 1 & 0 & 0 & 10 & 10 & 10 & 10 \end{array} \rightarrow 2B2$$

G) DEC \rightarrow OCT

$$8(10) \rightarrow 10(8)$$

$$56(10) \rightarrow \begin{array}{l} 56:8 \\ 7:8 \end{array} \left| \begin{array}{l} 0 \\ 7 \end{array} \right. \rightarrow 70(8)$$

$$31(10) \rightarrow \begin{array}{l} 31:8 \\ 3:8 \\ 0 \end{array} \left| \begin{array}{l} 7 \\ 9 \end{array} \right. \rightarrow 37(8)$$

$$7(10) \rightarrow 7(8)$$

$$2(10) \rightarrow 2(8)$$

$$1000(10) \rightarrow \begin{array}{l} 1000:8 \\ 125:8 \\ 15:8 \\ 1:8 \end{array} \left| \begin{array}{l} 0 \\ 5 \\ 7 \\ 1 \end{array} \right. \rightarrow 1750(8)$$

$$111(10) \rightarrow \begin{array}{l} 111:8 \\ 13:8 \\ 1:8 \end{array} \left| \begin{array}{l} 7 \\ 5 \\ 1 \end{array} \right. \rightarrow 157(8)$$

$$\textcircled{8} \quad 45(10) \rightarrow \begin{array}{l} 45:8 \\ 5:8 \end{array} \left| \begin{array}{l} 5 \\ 5 \end{array} \right. \rightarrow 55(8)$$



$$14825_{(10)} \rightarrow 34751_{(8)}$$

H) OCT \rightarrow DEC

$$25_{(8)} \rightarrow (2 \times 8^1) + (5 \times 8^0) = 21_{(10)}$$

$$10_{(8)} \rightarrow 8_{(10)}$$

$$24_{(8)} \rightarrow (2 \times 8^1) + (4 \times 8^0) = 20_{(10)}$$

$$7_{(8)} \rightarrow 7_{(10)}$$

$$2_{(8)} \rightarrow 2_{(10)}$$

$$621_{(8)} \xrightarrow{\begin{matrix} 6^1 & 16 \\ \end{matrix}} 6 \cdot 8^2 + 2 \cdot 8^1 + 1 = \cancel{401}_{(10)} 401_{(10)}$$

⑨

$$45_{(8)} \rightarrow 4 \cdot 8^1 + 5 \cdot 8^0 = \overset{37}{28}_{(10)}$$

$$34_{(8)} \rightarrow 3 \cdot 8^1 + 4 \cdot 8^0 = 28_{(10)}$$

$$5423_{(8)} \rightarrow 5 \cdot 8^3 + 4 \cdot 8^2 + 2 \cdot 8^1 + 3 \cdot 8^0 = \\ = 2835_{(10)}$$

1) * Сигнатура БС \rightarrow Температура БС
 $\overset{4 \cdot 1 + 4^0 \cdot 5}$

$$120_{(3)} \rightarrow 1 \cdot 3^2 + 2 \cdot 3^1 + 0 \cdot 3^0 \rightarrow 15_{(10)} \rightarrow 33_{(4)}$$

$$10_{(3)} \rightarrow 3_{(10)} \rightarrow 3_{(4)}$$

$$21_{(3)} \rightarrow 7_{(10)} \rightarrow 13_{(4)}$$

$$2110_{(3)} \rightarrow 66_{(10)} \rightarrow 1002_{(4)}$$

$$112_{(3)} \rightarrow 14_{(10)} \rightarrow 32_{(4)}$$

$$111221_{(3)} \rightarrow 376_{(10)} \rightarrow 11320_{(4)}$$



$$100_{(3)} \rightarrow 9_{(10)} \rightarrow 21_{(4)}$$

$$110_{(3)} \rightarrow 12_{(10)} \rightarrow 30_{(4)}$$

$$11001_{(3)} \rightarrow 109_{(10)} \rightarrow 1231_{(4)}$$