2.1) Binários → decimal

a) 10110

c) 100100001001

g) 111010111

i) 100110

k) 111011

e) 11111111

a)

1	0	1	1	0	=
2^4	2^3	2^2	2^1	2^0	

$1.16 + 0.8 + 1.4 + 1.2 + 0.1 =$

$16 + 0 + 4 + 2 + 0 = 22$

c)

1	0	0	1	0	0	0	0	1	0	0	1
2^{11}	2^{10}	2^9	2^8	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0

$1.2048 + 0.1024 + 0.512 + 1.256 + 0.128 + 0.64 + 0.32 + 0.16 + 1.8 + 0.4 + 0.2 + 1.1$

$= 2048 + 256 + 8 + 1 = 2313$

g)

1	1	1	1	0	1	0	1	1	1
2^9	2^8	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0

$1.512 + 1.256 + 1.128 + 1.64 + 0.32 + 1.16 + 0.8 + 1.4 + 1.2 + 1.1$

$= 512 + 256 + 128 + 64 + 16 + 4 + 2 + 1 = 983$

i)

1	0	0	1	1	0
2^5	2^4	2^3	2^2	2^1	2^0

$1.32 + 0.16 + 0.8 + 1.4 + 1.2 + 0.1$

$= 32 + 4 + 2 = 38$

k)

1	1	1	0	1	1
2^5	2^4	2^3	2^2	2^1	2^0

$1.32 + 1.16 + 1.8 + 0.4 + 1.2 + 1.1$

$= 32 + 16 + 8 + 2 + 1 = 59$

e)

1	1	1	1	1	1	1	1
2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0

$128 + 64 + 32 + 16 + 8 + 4 + 2 + 1 = 255$

2.2 decimal → binário

a) 37
c) 189
e) 77
g) 205
i) 511

a) 37 | 2
1 | 18 | 2
0 | 9 | 2
1 | 4 | 2
0 | 2 | 2
0 | 1

1 0 0 1 0 1

c) 189 | 2
1 | 94 | 2
0 | 47 | 2
1 | 23 | 2
1 | 11 | 2
1 | 5 | 2
1 | 2 | 2
0 | 1

1 0 1 1 1 1 0 1

e) 77 | 2
1 | 38 | 2
0 | 19 | 2
1 | 9 | 2
1 | 4 | 2
0 | 2 | 2
0 | 1

1 0 0 1 1 0 1

g) 205 | 2
1 | 102 | 2
0 | 51 | 2
1 | 25 | 2
1 | 12 | 2
0 | 6 | 2
0 | 3 | 2
1 | 1

1 1 0 0 1 1 0 1

i) 511 | 2
1 | 255 | 2
1 | 127 | 2
1 | 63 | 2
1 | 31 | 2
1 | 15 | 2
1 | 7 | 2
1 | 3 | 2
1 | 1

1 1 1 1 1 1 1 1 1

2.3

a) $1111111_2 = 256_{10}$

1	1	1	1	1	1	1	1
2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0

$128+64+32+16+8+4+2+1 = 255_{10}$

2.4) hexadecimal → decimal

a) 743

c) 37FD

e) 165

g) 7FF

a) $\begin{array}{c|c|c} 7 & 4 & 3 \\ \hline 16^2 & 16^1 & 16^0 \end{array}$ $= 7.256 + 4.16 + 3.1$
$= 1792 + 64 + 3$
$= 1859_{10}$

c) $\begin{array}{c|c|c|c} 3 & 7 & F & D \\ \hline 16^3 & 16^2 & 16^1 & 16^0 \end{array}$ $= 3.4096 + 7.256 + 15.16 + 13.1$
$= 12288 + 1792 + 240 + 13$
$= 14333_{10}$

e) $\begin{array}{c|c|c} 1 & 6 & 5 \\ \hline 16^2 & 16^1 & 16^0 \end{array}$ $= 1.256 + 6.16 + 5.1$
$= 256 + 96 + 5$
$= 357_{10}$

g) $\begin{array}{c|c|c} 7 & F & F \\ \hline 16^2 & 16^1 & 16^0 \end{array}$ $= 7.256 + 15.16 + 15.1$
$= 1792 + 240 + 15$
$= 2047_{10}$

2.5) decimal → hexadecimal

a) 59

c) 919

e) 771

g) 65.536

a) $59 \mid 16$
$48 \quad 3$
11 $\quad 311 \rightarrow 3B_{16}$

c) $919 \mid 16$
$912 \quad 57 \mid 16$
$7 \quad 48 \quad 3$
9 $\quad 397_{16}$

e) $771 \mid 16$
$768 \quad 48 \mid 16$
$3 \quad 48 \quad 3$
0 $\quad 303_{16}$

g) $65536 \mid 16$
$65536 \quad 4096 \mid 16$
$0 \quad 4096 \quad 256 \mid 16$
$0 \quad 256 \quad 16 \mid 16$
$0 \quad 16 \quad 1$
0 $\quad 10000_{16}$

2.6) Hexadecimal → binário (problema 2.4)

a) 743
c) 37FD
g) FF
e) 165

Hexa	Binário	Hexa	Binário
0	0000	8	1000
1	0001	9	1001
2	0010	A	1010
3	0011	B	1011
4	0100	C	1100
5	0101	D	1101
6	0110	E	1110
7	0111	F	1111

a) 7 | 4 | 3 = 111 0100 0011
0111 | 0100 | 0011

c) 3 | 7 | F | D = 11 0111 1111 1101
0011 | 0111 | 1111 | 1101

g) 7 | F | F = 111 1111 1111
0111 | 1111 | 1111

e) 1 | 6 | 5 = 1 0110 0101
0001 | 0110 | 0101

2.7) Binário → hexadecimal (problema 2.1)

a) 10110
c) 1001 0000 1001
g) 1111 0101 11
i) 11011
e) 1111111
k) 100110

a) $10110 \rightarrow \underbrace{0001}_{1}\ \underbrace{0110}_{6} = 16_{16}$

c) $1001\ 0000\ 1001 \rightarrow \underbrace{1001}_{9}\ \underbrace{0000}_{0}\ \underbrace{1001}_{9} = 909_{16}$

g) $1111\ 010111 \rightarrow \underbrace{0011}_{3}\ \underbrace{1101}_{D}\ \underbrace{0111}_{7} = 3D7_{16}$

k) $111011 \rightarrow \underbrace{0011}_{3}\ \underbrace{1011}_{B} = 3B_{16}$

e) $1111\ 1111 \rightarrow \underbrace{1111}_{F}\ \underbrace{1111}_{F} = FF_{16}$

i) $100110 \rightarrow \underbrace{0010}_{2}\ \underbrace{0110}_{6} = 26_{16}$

2.9 $2133_{10} \rightarrow ?_{16} \rightarrow ?_{2}$

2133	16
2128	133	16
5	128	8
	5	

855

8	5	5
1000	0101	0101

$= 100001010101$

2.11 Hexadecimal → decimal

a) 92

c) 37FD

e) 000F

g) 2C0

a) $\underset{16^1}{9} \mid \underset{16^0}{2}$ $= 9.16 + 2.1$
$= 144 + 2$
$= 146_{10}$

c) $\underset{16^3}{3} \mid \underset{16^2}{7} \mid \underset{16^1}{F} \mid \underset{16^0}{D}$

$= 3.4096 + 7.256 + 15.16 + 13.1$

= 12288 + 1792 + 240 + 13
= 14333

e)

0	0	0	F
16^3	16^2	16^1	16^0

= 0.4096 + 0.256 + 0.16 + 15.1
= 15

g)

2	C	0
16^2	16^1	16^0

= 2.256 + 12.16 + 0.1
= 512 + 192
= 704

2.12 decimal → hexadecimal

a) 75
c) 2048
e) 7245
g) 25619

a) 75 | 16
64 | 4
11

411
↓
$4B_{16}$

c) 2048 | 16
2048 | 128 | 16
0 | 128 | 8
0

800_{16}

e) 7245 | 16
7232 | 452 | 16
13 | 448 | 28 | 16 | 1
4 | 16 | 12
12

D
C

$1C4D_{16}$

g) 25619 | 16
25616 | 1601 | 16
3 | 1600 | 100 | 16
1 | 96 | 6
4

6413_{16}

2.15 maior valor três dígitos hexa?
FFF

2.16 Hexadecimal → binário (problema 2.11)

a) 92
d) 37FD
e) 000F
g) 2C0

a) 9 | 2 = 10010010_2
1001 | 0010

d) 3 | 7 | F | D = 11011111111101_2
0011 | 0111 | 1111 | 1101

e) 0 | 0 | 0 | F = 1111_2
0000 | 0000 | 0000 | 1111

g) 2 | C | 0 = 1011000000_2
0010 | 1100 | 0000

2.17 Hexa de 280 a 2A0

280	286	28C	292	298	29E
281	287	28D	293	299	29F
282	288	28E	294	29A	2A0
283	289	28F	295	29B	
284	28A	290	296	29C	
285	28B	291	297	29D	

2.19 decimal em BCD

a) 47
c) 187
e) 13
i) 72
k) 61
g) 89627

a) 4 | 7 = 01000111
0100 | 0111

c) 1 | 8 | 7 = 000110000111
0001 | 1000 | 0111

e) 1 | 3 = 00010011
0001 | 0011

g) 8 | 9 | 6 | 2 | 7 =
1000 | 1001 | 0110 | 0010 | 0111
→ 100010010110001000111

i) 7 | 2 = 01110010
0111 | 0010

k) 6 | 1 = 01100001
0110 | 0001

2.21 BCD → decimal

a) 1001 0111 0101 0010 = 9752
(9 7 5 2)

c) 0110 1001 0101 = 695
(6 9 5)

e) 0100 1001 0010 = 492
(4 9 2)