Exercícios - AOC

a) $101010_2 = 42_{10}$

$2^0 = 0$
$2^1 = 2$
$2^2 = 0$
$2^3 = 8$
$2^4 = 0$
$2^5 = 32$

$32 + 8 + 2 = 42$

b) $1010_3 = 30_{10}$

$3^0 \times 0 = 0$
$3^1 \times 1 = 3$
$3^2 \times 0 = 0$
$3^3 \times 1 = 27$

c) $1021_4 = 81_{10}$

$4^0 \times 1 = 1$
$4^1 \times 2 = 96$
$4^2 \times 0 = 0$
$4^3 \times 1 = 64$

d) $1025_6 = 233_{10}$

$6^0 \times 5 = 5$
$6^1 \times 2 = 12$
$6^2 \times 0 = 0$
$6^3 \times 1 = 216$

e) $2165_8 = 1141_{10}$

$8^0 \times 5 = 5$
$8^1 \times 6 = 48$
$8^2 \times 1 = 64$
$8^3 \times 2 = 1024$

f) $1FA2_{16} = 8098_{10}$

$16^0 \times 2 = 2$
$16^1 \times 10 = 1000$
$16^2 \times 15 = 3840$
$16^3 \times 1 = 4096$

g) $F1A_{16} = 3610_{10}$

$16^0 \times 10 = 10$
$16^1 \times 1 = 16$
$16^2 \times 15 = 3584$

h) $707_8 = 455_{10}$

$8^0 \times 7 = 7$
$8^1 \times 0 = 0$
$8^2 \times 7 = 448$

a) $72_{10} = 1001\ 0000_2$

72 |2
72 36 |2
0 36 18 |2
0 18 9 |2
0 -8 4 |2
1 -4 2 |2
0 -2 1
0

b) $127_{10} = 111\ 1110_2$

127 |2
126 63 |2
1 62 31 |2
1 30 15 |2
1 14 7 |2
1 -6 3 |2
1 -2 1
1

c) $35_{10} = 1000\ 1100_2$

35 |2
-34 17 |2
01 -16 8 |2
1 -8 4 |2
0 -4 2 |2
0 -2 1
0

d) $23_{10} = 1011\ 1000_2$

23 |2
-22 11 |2
1 -10 5 |2
1 -4 2 |2
1 -2 1
0

e) $165_{10} = 1010\ 0101_2$

165 |2
164 82 |2
1 -82 41 |2
0 40 20 |2
0 -20 10 |2
0 10 5 |2
0 -4 2 |2
1 2 1
0

f) $40_{10} = 1010\ 0000_2$

40 |2
40 20 |2
0 20 10 |2
0 10 5 |2
0 4 2 |2
1 -2 1
0

a) $22_{10} = 10110_2$

22 | 2
22 | 11 | 2
0 | 10 | 5 | 2
1 | 4 | 2 | 2
1 | 2 | 1
0

b) $8_{10} = 1000_2$

8 | 2
8 | 4 | 2
0 | 4 | 2 | 2
0 | 2 | 1
1

3) a) $100001_2 = 33_{10}$

2^0
$2^0 \times 1 = 1$
$2^1 \times 0 = 0$
$2^2 \times 0 = 0$
$2^3 \times 0 = 0$
$2^4 \times 0 = 0$
$2^5 \times 1 = 32$

b) $11011_2 = 27_{10}$

$2^0 \times 1$
$2^1 \times 1 = 2$
$2^2 \times 0 = 0$
$2^3 = 8$
$2^4 \times 1 = 16$

c) $1100100_2 = 100_{10}$

$2^0 \times 0 = 0$
$2^1 \times 0 = 0$
$2^2 \times 1 = 4$
$2^3 \times 0 = 0$
$2^4 \times 0 = 0$
$2^5 \times 1 = 32$
$2^6 \times 1 = 64$

d) $10000000_2 = 128_{10}$

$2^0 \times 0 = 0$
$2^1 \times 0 = 0$
$2^2 \times 0 = 0$
$2^3 \times 0 = 0$
$2^4 \times 0 = 0$
$2^5 \times 0 = 0$
$2^6 \times 0 = 0$
$2^7 \times 1 = 128$

e) $11001011_2 = 331$

$2^0 \times 1 = 1$
$2^1 \times 1 = 2$
$2^2 \times 0 = 0$
$2^3 \times 1 = 8$
$2^4 \times 0 = 20$
$2^5 \times 0 = 0$

f) $10110001_2 = 178_2$

g) $10111001_2 = 185_{10}$

$2^0 \times 1 = 1$
$2^1 = 0$
$2^2 = 0$
$2^3 = 8$
$2^4 = 16$
$2^5 = 32$
$2^6 = 0$
$2^7 = 128$

h) $100110000_2 = 304_{10}$

$2^4 \times 1 = 16$
$2^5 \times 1 = 32$
$2^8 \times 1 = 256$

a) $567_8 = 375_{10}$

$8^0 \times 7 = 7$
$8^1 \times 6 = 48$
$8^2 \times 5 = 320$

b) $983_8 = 643_{10}$

$8^0 \times 3 = 3$
$8^1 \times 8 = 64$
$8^2 \times 9 = 576$

c) $1020_8 = 528_{10}$

$8^2 \times 0 = 0$
$8^1 \times 2 = 16$
$8^2 \times 0 = 0$
$8^3 \times 1 = 512$

d) $65_8 = 53_{10}$

$8^0 \times 5 = 5$
$8^1 \times 6 = 48$

e) $680_8 = 448_{10}$

$8^0 \times 0 = 0$
$8^1 \times 8 = 64$
$8^2 \times 6 = 384$

f) $105_8 = 69_{10}$

$8^0 = 5$
$8^1 = 0$
$8^2 \times 1 = 64$

g) $294_8 = 204_{10}$

$8^0 \times 4 = 4$
$8^1 \times 9 = 72$
$8^2 \times 2 = 128$

h) $679_8 = 953_{10}$

$8^0 \times 9 = 9$
$8^1 \times 7 = 56$
$8^2 \times 6 = 384$

5- a) $867_{10} = C87_{16}$

$16^0 \times 7 = 7$
$16^1 \times 8 = 96$
$16^2 \times 5 = 1280$ } 1287

b) $9083_{10} = 2435_{16}$

$16^0 \times 3 = 3$
$16^1 \times 3 = 123$
$16^2 \times 9 = 2304$ } 2435

c) $10290_{10} = 4C9_{16}$

$16^0 \times 0 = 0$
$16^1 \times 2 = 32$
$16^2 \times 0 = 0$
$16^3 \times 1 = 4096$ } 4129

d) $65_{10} = A1_{16}$

$16^0 \times 5 = 5$
$16^1 \times 6 = 96$ } 101

e) $680_{10} = 3C4_{16}$

$16^0 \times 0 = 0$
$16^1 \times 8 = 128$
$16^2 \times 6 = 1536$ } 1664

f) $105_{10} = 261_{16}$

$16^0 \times 5 = 5$
$16^1 \times 0 = 0$
$16^2 \times 1 = 250$ } 261

g) $294_{10} = 660_{16}$

$16^0 \times 4 = 4$
$16^1 \times 9 = 144$
$16^2 \times 2 = 512$ } 660

h) $679_{10} = G57_{16}$

$16^0 \times 9 = 9$
$16^1 \times 7 = 112$
$16^2 \times 6 = 1536$ } 1657

6 a) $3365_8 =$ 011 011 110 101$_2$

101
110
011
011

b) $752_8 =$ 111101010$_2$

010
101
111

c) 625_8 = 110 010 101$_2$ d) 13703_8 = 001011111000011

101
010
110

e) 69105_8 = 110 111 001 000 101$_2$ f) 12004_8 = 010 000 000 100$_2$

g) 321_8 = 011010001 h) 7654_8 = 111 110 101 100$_2$

i) 111101_2 = 105_8 j) 1111001_2 = 363_8

001 = 1
110 = 6
101 = 5

011 = 3
110 = 6
011 = 3

c) 101 001 110 010 111 011 100 000 = 51627340_8
5 1 6 2 7 3 4 0

d) 111 011 010 001 000 001 = 732101_8
7 3 2 1 0 1

e) 100 110 101

d) 111 101 111 000 = 7570_8
7 5 7 0

e) 101 010 101 010 010 = 52522_8
5 2 5 2 2

f) 111 100 001 010 = 7512_8
7 4 1 2

g) 110 100 010 = 652_8
6 5 2

h) 101 111 100 011 = 5763_8
5 7 4 3

9a) FS_{16} = 0111 1010$_2$ = 372_8

b) $AB7_{16}$ = 1010 1011 0111$_2$ = 5267_8

c) $9BA_{16}$ = 1001 1000 1010$_2$ = 4612_8

d) $F1E2_{16}$ = 001111 0001 1110 0010$_2$ = 170742_8

e) $E229_{16}$ = 001110 0010 0010 1001 = 161051_8

f) 135_{16} = 0001 0011 0101$_2$ = 0465_8

g) 710_{16} = 000111 0001 0000$_2$ = 07040_8

h) $CE1_{16}$ = 1100 1110 0001$_2$ = 6361_8

10a) 2 KB = 2048 bytes = 16.384 bits c) 2^{15}

b) 32 GB = 32.768 mb = 33.554.432 Kb = 34.359.738.368 bits