SEL0414 - Sistemas Digitais
Resolução Lista 6 - Sistemas de Numeração

01

a.

$(10110)_b = 2^4 + 2^2 + 2^1 = 22$

b.

$(1001000001001)_b = 2^12 + 2^9 + 2^3 + 2^0 = 4617$

c.

$(11111111)_b = 2^7 + 2^6 + 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0 = 2^8 - 1 = 255$

d.

$(100110)_b = 2^5 + 2^2 + 2^1 = 38$

e.

$(1111010111)_b = 2^9 + 2^8 + 2^7 + 2^6 + 2^4 + 2^2 + 2^1 + 2^0 = 983$

02

a.

$37 = 2 \cdot 18 + 1 = 2^2 \cdot 9 + 1 = 2^2 \cdot (2 \cdot 4 + 1) + 1 = 2^5 + 2^2 + 2^0 = (100101)_b$

b.

$189 = 2\,94 + 1 = 2^2\,47 + 1 = 2^2\,(2\,23 + 1) + 1 = 2^3\,23 + 2^2 + 1 = 2^3\,(11\,2 + 1) + 2^2 + 1 =$
$2^4 \cdot 11 + 2^3 + 2^2 + 1 = 2^4\,(2\,5 + 1) + 2^3 + 2^2 + 1 = 2^5\,5 + 2^4 + 2^3 + 2^2 + 1 = 2^5\,(2\,2 + 1) + 2^4 + 2^3 + 2^2 + 1 =$
$2^7 + 2^5 + 2^4 + 2^3 + 2^2 + 2^0 = (10111101)_b$

c.

$77 = 2 \cdot 38 + 1 = 2^2 \cdot 19 + 1 = 2^2 \cdot (2 \cdot 9 + 1) + 1 = 2^3 \cdot 9 + 2^2 + 1 = 2^3 \cdot (2 \cdot 4 + 1) + 2^2 + 1 = 2^6 + 2^3 + 2^2 + 2^0 =$
$(1001101)_b$

d.

$205 = 2 \cdot 102 + 1 = 2^2 \cdot 51 + 1 = 2^2 \cdot (2 \cdot 25 + 1) + 1 = 2^3 \cdot 25 + 2^2 + 1 = 2^3 \cdot (2 \cdot 12 + 1) + 2^2 + 1 =$
$2^4 \cdot 12 + 2^3 + 2^2 + 1 = 2^5 \cdot 6 + 2^3 + 2^2 + 1 = 2^6 \cdot 3 + 2^3 + 2^2 + 1 = 2^7 + 2^6 + 2^3 + 2^2 + 2^0 = (11001101)_b$

e.

$511 = 512 - 1 = 2^9 - 1 = 2^8 + 2^7 + 2^6 + 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0 = (11111111)_b$

03

a.

$(B0B0)_h = 11 \cdot 16^3 + 11 \cdot 16^1 = 45232$

b.

$(37F\ D)_h = 3 \cdot 16^3 + 7 \cdot 16^2 + 15 \cdot 16^1 + 13 = 14333$

c.

$(F\ E10)_h = 15 \cdot 16^3 + 14 \cdot 16^2 + 1 \cdot 16^1 = 65040$

d.

$(7F\ F\ )_h = 7 \cdot 16^2 + 15 \cdot 16^1 + 15 = 2047$

04

a.

$59 = 3 \cdot 16 + 11 = (3B)_h$

b.

$919 = 57 \cdot 16 + 7 = (3 \cdot 16 + 9) \cdot 16 + 7 = 3 \cdot 16^2 + 9 \cdot 16 + 7 = (397)_h$

c.

$771 = 48 \cdot 16 + 3 = 3 \cdot 16^2 + 3 = (303)_h$

05

a.

$(5432)_h = (0101\ 0100\ 0011\ 0010)_b$

b.

$(1322)_h = (0001\ 0011\ 0010\ 0010)_b$

c.

$(2435)_h = (0010\ 0100\ 0011\ 0101)_b$

d.

$(2110)_h = (0010\ 0001\ 0001\ 0000)_b$

07

a.

$(5432)_8 = 5 \cdot 8^3 + 4 \cdot 8^2 + 3 \cdot 8^1 + 2 \cdot 8^0 = 2842$

b.

$(1322)_4 = 1 \cdot 4^3 + 3 \cdot 4^2 + 2 \cdot 4^1 + 2 \cdot 4^0 = 122$

c.

$(2435)_5 = 2 \cdot 5^3 + 4 \cdot 5^2 + 3 \cdot 5^1 + 5 \cdot 5^0 = 370$

d.

$(2110)_3 = 2 \cdot 3^3 + 1 \cdot 3^2 + 1 \cdot 3^1 + 0 \cdot 3^0 = 66$

08

a.

$47 = (0100\ 0111)_{BCD}$

b.

$187 = (0001\ 1000\ 0111)_{BCD}$

c.

$13 = (0001\ 0011)_{BCD}$

d.

$89627 = (1000\ 1001\ 0110\ 0010\ 0111)_{BCD}$

e.

$72 = (0111\ 0010)_{BCD}$