1-) Explique a formação de cada base dos números; depois converta-os para base decimal

a-) 1001_3

$1.3^4 + 0.3^3 + 0.3^2 + 1.3^1 + 2.3^0$

$81 + 0 + 0 + 3 + 2 = 86_{10}$

b-) 1321_4

$1.4^3 + 3.4^2 + 2.4^1 + 1.4^0$

$64 + 316 + 8 + 1 = 121_{10}$

c-) 1241_5

$1.5^3 + 2.5^2 + 4.5^1 + 1.5^0$

$125 + 50 + 20 + 1 = 196_{10}$

d-) 1025_6

$1.6^3 + 0.6^2 + 2.6^1 + 5.6^0$

$216 + 0 + 12 + 5 = 233_{10}$

e-) 2165_7

$2.7^3 + 1.7^2 + 6.7^1 + 5.7^0$

$2.343 + 49 + 42 + 5 = 782_{10}$

f-) 3701_8

$3.8^3 + 7.8^2 + 0.8^1 + 1.8^0$

$1536 + 448 + 0 + 1 = 1985_{10}$

g-) 5610_8

$5.8^3 + 6.8^2 + 1.8^1 + 0.8^0$

$2560 + 384 + 8 + 0 = 2952_{10}$

h-) 12473_8

$1.8^4 + 2.8^3 + 4.8^2 + 7.8^1 + 3.8^0$

$4096 + 1024 + 256 + 56 + 3 = 5435_{10}$

i-) 851_9

$8.9^2 + 5.9^1 + 1.9^0$

$648 + 45 + 1 = 694_{10}$

j-) $AF2E_{16}$

$A.16^3 + F.16^2 + 2.16^1 + E.16^0$

$10.16^3 + 15.16^2 + 2.16^1 + 14.16^0$

$40960 + 3840 + 32 + 14 = 44846_{10}$

k-) $6D5C_{16}$

$6.16^3 + D.16^2 + 5.16^1 + C.16^0$

$6.16^3 + 13.16^2 + 5.16^1 + 12.16^0$

$24576 + 3328 + 80 + 12 = 27996_{10}$

l-) $21B94_{16}$

$2.16^4 + 1.16^3 + B.16^2 + 9.16^1 + 4.16^0$

$131072 + 4096 + 2816 + 144 + 4 = 138132_{10}$

A BASE DECIMAL UTILIZA NÚMEROS DE 0 a 9 (10 dígitos)
A BASE BINARIA UTILIZA DOIS DIGITOS 0 e 1 É USADA PELO PC
A BASE HEXADECIMAL UTILIZA OS DÍGITOS DE 0 a 9 e AS LETRAS DE A a f (10 a 15)
A BASE OCTAL UTILIZA DE 0 a 7 (8 DÍGITOS)

2-) converta os seguintes números em base binária para a base decimal

a-) 100001_2

$1.2^6 + 1.2^0 \therefore = 33_{10}$

b-) 110011_2

$1.2^4 + 1.2^3 + 1.2^1 + 1.2^0 = 27_{10}$

c-) 11001001_2

$1.2^6 + 1.2^5 + 1.2^2 = 100_{10}$

d-) 10000000_2

$1.2^7 = 128_{10}$

e-) 11001011_2

$1.2^7 + 1.2^6 + 1.2^3 + 1.2^1 + 1.2^0 = 203_{10}$

f-) 10111000_2

$1.2^7 + 1.2^6 + 1.2^4 + 1.2^0 = 177_{10}$

g-) 10100101_2

$1.2^7 + 1.2^5 + 1.2^2 + 1.2^0 = 165_{10}$

h-) $1001\ 10000$

$1.2^8 + 1.2^5 + 1.2^4 = 304_{10}$

3-) converta os seguintes números em base binária para a b Hexadecimal

a-) $\underbrace{1100}_{C_{16}}\ \underbrace{1010}_{A_{16}}\ \underbrace{0101}_{5_{16}}\ \underbrace{1010}_{A_{16}} = CA5A_{16}$

b-) $\underbrace{1111}_{F_{16}}\ \underbrace{1010}_{A_{16}}\ \underbrace{1100}_{C_{16}}\ \underbrace{1010}_{A_{16}} = FACA_{16}$

c-) $\underbrace{1101}_{D_{16}}\ \underbrace{0000}_{0_{16}}\ \underbrace{0001}_{1_{16}}\ \underbrace{1101}_{D_{16}}\ \underbrace{1010}_{A_{16}} = D01DA_{16}$

d-) $\underbrace{1110}_{E_{16}}\ \underbrace{1101}_{D_{16}}\ \underbrace{0001}_{1_{16}}\ \underbrace{0001}_{1_{16}} = ED11_{16}$

e-) $\underbrace{1001}_{9_{16}}\ \underbrace{1010}_{A_{16}}\ \underbrace{1011}_{B_{16}}\ \underbrace{1100}_{C_{16}}\ \underbrace{1101}_{D_{16}}\ \underbrace{1110}_{E_{16}} = 9ABCDE_{16}$

f-) $\underbrace{1001}_{9_{16}}\ \underbrace{0001}_{1_{16}}\ \underbrace{1010}_{A_{16}}\ \underbrace{0010}_{2_{16}} = 91A2_{16}$

g-) $\underbrace{0001}_{1_{16}}\ \underbrace{1001}_{9_{16}}\ \underbrace{1110}_{E_{16}}\ \underbrace{0010}_{2_{16}}\ \underbrace{0110}_{6_{16}} = 19E26_{16}$

h-) $\underbrace{1011}_{B_{16}}\ \underbrace{0000}_{0_{16}}\ \underbrace{1100}_{C_{16}}\ \underbrace{1010}_{A_{16}} = B0CA_{16}$

4-) converta os seguintes números em base binária para a base octal:

a-) $\underbrace{001}_{1}\ \underbrace{110}_{6}\ \underbrace{101}_{5} = 165_8$

b-) $\underbrace{011}_{3}\ \underbrace{110}_{6}\ \underbrace{011}_{3} = 363_8$

c-) $\underbrace{010}_{2}\ \underbrace{100}_{4}\ \underbrace{111}_{7}\ \underbrace{001}_{1}\ \underbrace{000}_{0} = 24710_8$

d-) $\underbrace{111}_{7}\ \underbrace{101}_{5}\ \underbrace{110}_{8} = 758_8$

e-) $\underbrace{010}_{2}\ \underbrace{101}_{5}\ \underbrace{010}_{2}\ \underbrace{101}_{5}\ \underbrace{010}_{2} = 25252_8$

f-) $\underbrace{111}_{7}\ \underbrace{101}_{5}\ \underbrace{001}_{1}\ \underbrace{010}_{2} = 7512_8$

g-) $\underbrace{110}_{6}\ \underbrace{100}_{4}\ \underbrace{010}_{2} = 642_8$

h-) $\underbrace{010}_{2}\ \underbrace{111}_{7}\ \underbrace{110}_{6}\ \underbrace{011}_{3} = 2763_8$

5-) converta os seguintes números em Base hexadecimal para base binária

a-) $A14_{16} = 101000010100$

$A_{16} = 1010_2$

$1_{16} = 0001_2$

$4_{16} = 0100_2$

b-) $DBZ_{16} = 110111011010_2$

$D_{16} = 1101_2$

$B_{16} = 1011_2$

$Z_{16} = 0010_2$

c-) $8CE_{16} = 100011001110_2$

$8_{16} = 1000_2$

$C_{16} = 1100_2$

$E_{16} = 1110_2$

d-) $F1B9_{16} = 1111000110111001_2$

$F_{16} = 1111_2$

$9_{16} = 1001_2$

e-) $2C68_{16} = 0010\ 1100\ 0110\ 1000_2$

$6_{16} = 0110_2$

f-) $1325_{16} = 0001001100100101_2$

$3_{16} = 0011_2$

~~2_{16}~~

$5_{16} = 0101_2$

g-) $37D1_{16} = 0011\ 0111\ 1101\ 0001_2$

$7_{16} = 0111_2$

h-) $CFE_{16} = 110011111110_2$

6-) converta os seguintes números em base hexadecimal para a base octal

a-) $FB_{16} = 1111\,1011_2 = 373_8$

$F_{16} = 1111_2$ ⟍
$B_{16} = 1011_2$ ⟋ = $\underbrace{011}_{3_8}\ \underbrace{111}_{7_8}\ \underbrace{011}_{3_8}$

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

$A_{16} = 1010_2$ ⟍
$B_{16} = 1011_2$ ⟋ = $\underbrace{101}_{5_8}\ \underbrace{010}_{2_8}\ \underbrace{110}_{6_8}\ \underbrace{111}_{7_8}$
$7_{16} = 0111_2$

c-) $98A_{16} = 1001\,1000\,1010_2 = 4612_8$

$9_{16} = 1001_2$ ⟍
$8_{16} = 1000_2$ ⟋ = $\underbrace{100}_{4_8}\ \underbrace{110}_{6_8}\ \underbrace{001}_{1_8}\ \underbrace{010}_{2_8}$
$A_{16} = 1010_2$

d-) $F1E2_{16} = 1111\,0001\,1110\,0010_2 = 170342_8$

$F_{16} = 1111_2$ ⟍
$1_{16} = 0001_2$ ⟋ = $\underbrace{111}_{7_8}\ \underbrace{100}_{4_8}\ \underbrace{011}_{3_8}\ \underbrace{110}_{6_8}\ \underbrace{001}_{1_8}\ \underbrace{010}_{2_8}$
$E_{16} = 1110_2$
$2_{16} = 0010_2$

e-) $E229_{16} = 1110\,0010\,0010\,1001_2 = 161051_8$

$\underbrace{111}_{7_8}\ \underbrace{000}_{0_8}\ \underbrace{100}_{4_8}\ \underbrace{010}_{2_8}\ \underbrace{010}_{2_8}\ \underbrace{001}_{1_8}$

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

$3_{16} = 0011_2$ ⟍ = $\underbrace{000}_{0_8}\ \underbrace{100}_{4_8}\ \underbrace{110}_{6_8}\ \underbrace{101}_{5_8}$
⟋

g-) $7A0_{16} = 0111\,1010\,0000_2 = 3620_8$

$\underbrace{011}_{3_8}\ \underbrace{110}_{6_8}\ \underbrace{010}_{2_8}\ \underbrace{000}_{0_8}$

h-) $CE1_{16} = 1100\,1110\,0001_2 = 6341_8$

$C_{16} = 1100_2$ ⟍ = $\underbrace{110}_{6_8}\ \underbrace{011}_{3_8}\ \underbrace{100}_{4_8}\ \underbrace{001}_{1_8}$
⟋

7-) converta os seguintes números em base octal para base binária

a-) $3365_8 = 011011101011_2$

$3_8 = 011_2$
$6_8 = 110_2$
$5_8 = 101_2$

b-) $752_8 = 111101011010_2$

$7_8 = 111_2$
$2_8 = 010_2$

c-) $625_8 = 110010101101_2$

d-) $13703_8 = 001011111000011_2$

$1_8 = 001_2$
$0_8 = 000_2$

e-) $6715_8 = 110111001101101_2$

f-) $2004_8 = 010000000100_2$

$4_8 = 100_2$

g-) $321_8 = 011010001_2$

h-) $7654_8 = 111110101100_2$

8-) converta os seguintes números em base octal para a base binária

a-) $3132_8 = 011001011010_2$

$3_8 = 011_2$
$1_8 = 001_2$
$2_8 = 010_2$

b-) $472_8 = 100111010_2$

$4_8 = 100_2$
$7_8 = 111_2$

c-) $735_8 = 111011101_2$

$5_8 = 101_2$

d-) $1673_8 = 001110111011_2$

$6_8 = 110_2$

e-) $65535_8 = 110101101101101_2$

f-) $65536_8 = 1101011011011110_2$

g-) $323_8 = 011010011_2$

h-) $7434_8 = 111100011100_2$

9-) converta os seguintes números em base decimal para a base binária

a-) $72_{10} = 1001000_2$

72/2 = 36 r = 0
36/2 = 18 r = 0
18/2 = 9 r = 0
9/2 = 4 r = 1
4/2 = 2 r = 0
2/2 = 1 r = 0
1/2 = 0 r = 1

b-) $127_{10} = 1111111_2$

127/2 r = 1
63/2 r = 1
31/2 r = 1
15/2 r = 1
7/2 r = 1
3/2 r = 1
1/2 r = 1

c-) $128_{10} = 10000000_2$

128/2 = 64 0
64/2 = 32 0
32/2 = 16 0
16/2 = 8 0
8/2 = 4 0
4/2 = 2 0
2/2 = 1 0
1/2 = 0 1

d-) $295_{10} = 100100111_2$

295/2 = 147 1
147/2 = 73 1
73/2 = 36 1
36/2 = 18 0
18/2 = 9 0
9/2 = 4 1
4/2 = 2 0
2/2 = 1 0
1/2 = 0 1

e-) $345_{10} = 101011001_2$

345 = 672 1
672 = 336 0
336 = 168 0
168 = 84 0
84 = 42 0
42 = 21 0
21 = 10 1
10 = 5 0
5 = 2 1
2 = 1 0
1 = 0 1

f-) $2550_{10} = 100111111110_2$

2550 = 1275 0
1275 = 637 1
637 = 318 1
318 = 159 0
159 = 79 1
79 = 39 1
39 = 19 1
19 = 9 1
9 = 4 1
4 = 2 0
2 = 1 0
1 = 0 1

g-) $4095_{10} = 111111111111_2$

4095 = 2047 1
2047 = 1023 1
1023 = 511 1
511 = 255 1
255 = 127 1
127 = 63 1
63 = 31 1
31 = 15 1
15 = 7 1
7 = 3 1
3 = 1 1
1 = 0 1

h-) $65535_{10} = 1111111111111111_2$

65535 1
32767 1
16383 1
8191 1
4095 1
2047 1
1023 1
511 1
255 1
127 1
63 1
31 1
15 1
7 1
3 1
1 1
0

10-) converta os seguintes números em base decimal para base octal

a-) $127_{10} = 177_8$

127/8 = 15 7
15/8 = 1 7
1/8 = 0 1

b-) $256_{10} = 400_8$

256/8 = 32 0
32/8 = 4 0
4/8 = 0 4

c-) $1023_{10} = 1777_8$

1023/8 = 127 7
127/8 = 15 7
15/8 = 1 7
1/8 = 0 1

d-) $2295_{10} = 7634_8$

2295/8 = 286 7
286/8 = 35 6
35/8 = 4 3
4/8 = 0 4

e-) $3041_{10} = 5475_8$

3041/8 = 380 1
380/8 = 47 4
47/8 = 5 7
5/8 = 0 5

f-) $4096_{10} = 10000_8$

4096/8 = 512 0
512/8 = 64 0
64/8 = 8 0
8/8 = 1 0
1/8 = 0 1

g-) $8942_{10} = 21356_8$

8942/8 = 1117 6
1117/8 = 139 5
139/8 = 17 3
17/8 = 2 1
2/8 = 0 2

h-) $65535_{10} = 177777_8$

65535/8 = 8191 7
8191/8 = 1023 7
1023/8 = 127 7
127/8 = 15 7
15/8 = 1 7
1/8 = 0 1

11-) converta os seguintes números em base decimal para a base hexadecimal

a-) $6_{10} = 6_{16}$

6/16 = 0 6

b-) $63_{10} = 3F_{16}$

63/16 = 3 15 = F
3/16 = 0 3

c-) $126_{10} = 7E_{16}$

126/16 = 7 14 = E
7/16 = 0 7

d-) $265_{10} = 109_{16}$

265/16 = 16 9
16/16 = 1 0
1/16 = 0 1

e-) $537_{10} = 219_{16}$

537/16 = 33 9
33/16 = 2 1
2/16 = 0 2

f-) $1023_{10} = 3FF_{16}$

1023/16 = 63 15 = F
63/16 = 3 15 = F
3/16 = 0 3

g-) $2049_{10} = 801_{16}$

2049/16 = 128 1
128/16 = 8 0
8/16 = 0 8

h-) $65535_{10} = FFFF_{16}$

65535/16 = 4095 15 = F
4095/16 = 255 15 = F
255/16 = 15 15 = F
15/16 = 0 15 = F