

Exercícios – Circuitos Digitais

Sistemas de numeração - conversão entre bases

1. Conversão do sistema binário para o sistema decimal.

a) $(1010)_2 = (?)_{10}$

b) $(100000000)_2 = (?)_{10}$

c) $(11111111)_2 = (?)_{10}$

d) $(100000001)_2 = (?)_{10}$

e) $(1101110111)_2 = (?)_{10}$

2. Conversão do sistema hexadecimal para o sistema decimal.

a) $(352)_{16} = (?)_{10}$

b) $(40A)_{16} = (?)_{10}$

c) $(100)_{16} = (?)_{10}$

d) $(FF)_{16} = (?)_{10}$

e) $(F4D0)_{16} = (?)_{10}$

3. Conversão do sistema decimal para o sistema binário.

a) $(20)_{10} = (?)_2$

b) $(40)_{10} = (?)_2$

c) $(64)_{10} = (?)_2$

d) $(493)_{10} = (?)_2$

e) $(100)_{10} = (?)_2$

4. Conversão do sistema decimal para o sistema hexadecimal.

a) $(512)_{10} = (?)_{16}$

b) $(513)_{10} = (?)_{16}$

c) $(2533)_{10} = (?)_{16}$

d) $(1000)_{10} = (?)_{16}$

e) $(6312)_{10} = (?)_{16}$

5. Conversão do sistema binário para o sistema hexadecimal.

a) $(1001101110001110)_2 = (?)_{16}$

b) $(1111111011)_2 = (?)_{16}$

c) $(1010010100110001)_2 = (?)_{16}$

d) $(1000000011111111000000011)_2 = (?)_{16}$

e) $(11110111001100010000)_2 = (?)_{16}$

6. Conversão do sistema hexadecimal para o sistema binário.

a) $(B9FA)_{16} = (?)_2$

b) $(5D8F)_{16} = (?)_2$

c) $(42E1)_{16} = (?)_2$

d) $(221A5)_{16} = (?)_2$

e) $(10010)_{16} = (?)_2$

7. Conversão do sistema binário para o sistema decimal.

a) $(11,11)_2$

b) $(1000,0001)_2$

c) $(1010,1010)_2$

d) $(1100,1101)_2$

e) $(10011,10011)_2$

8. Conversão do sistema decimal para o sistema binário.

a) $(0,125)_{10}$

b) $(0,0625)_{10}$

c) $(0,7)_{10}$

d) $(0,92)_{10}$

e) $(7,9)_{10}$

Operações Aritméticas no Sistema Binário

9. Efetue as operações:

$$\begin{array}{r} 1111 \\ + 1001 \\ \hline \end{array}$$

$$\begin{array}{r} 100101 \\ + 101 \\ \hline \end{array}$$

$$\begin{array}{r} 1111 \\ - 1011 \\ \hline \end{array}$$

$$\begin{array}{r} 1001 \\ - 111 \\ \hline \end{array}$$

$$\begin{array}{r} 11 \\ 11 \\ 1111 \\ + 1001 \\ \hline \end{array}$$

$$\begin{array}{r} 111101 \\ 101111 \\ 100101 \\ + 101 \\ \hline \end{array}$$

$$\begin{array}{r} 1100 \\ - 1011 \\ \hline \end{array}$$

$$\begin{array}{r} 1000 \\ - 111 \\ \hline \end{array}$$

10. Efetue as operações utilizando o complemento de 2:

$$\begin{array}{r} 101101 \\ - 100111 \\ \hline \end{array}$$

$$\begin{array}{r} 10000110 \\ - 110011 \\ \hline \end{array}$$

$$\begin{array}{r} 111100 \\ - 11101011 \\ \hline \end{array}$$

11. Efetue em binário as operações, utilizando a aritmética do complemento de 2:

$$\begin{array}{r} AB9_{(16)} \\ + 35F_{(16)} \\ \hline \end{array}$$

$$\begin{array}{r} DF1_{(16)} \\ - A1E_{(16)} \\ \hline \end{array}$$

$$1AD3_{(16)} \\ + \underline{DAF}_{(16)}$$

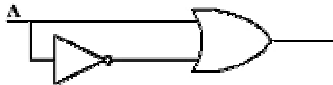
$$1AF_{(16)} \\ - \underline{BF}_{(16)}$$

$$2DE1_{(16)} \\ + \underline{AF5}_{(16)}$$

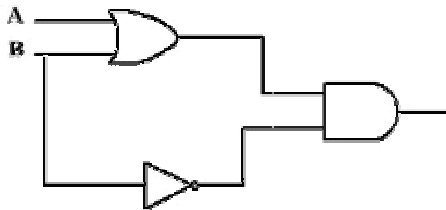
$$BF1_{(16)} \\ - \underline{AC}_{(16)}$$

12. Determine a expressão booleana característica e a tabela verdade dos circuitos:

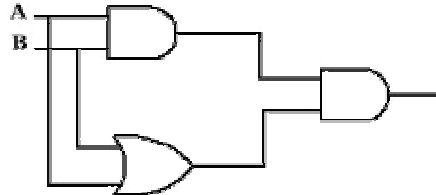
a)



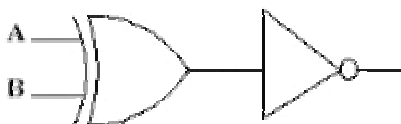
b)



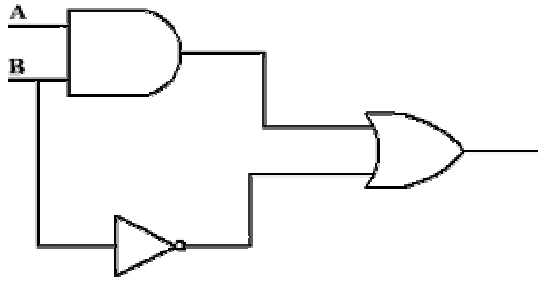
c)



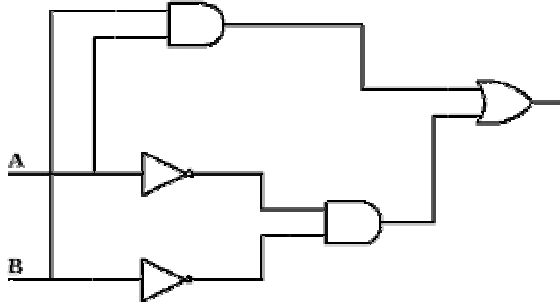
d)



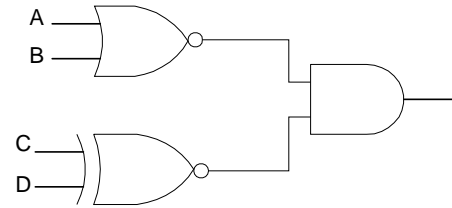
e)



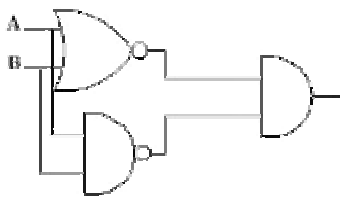
f)



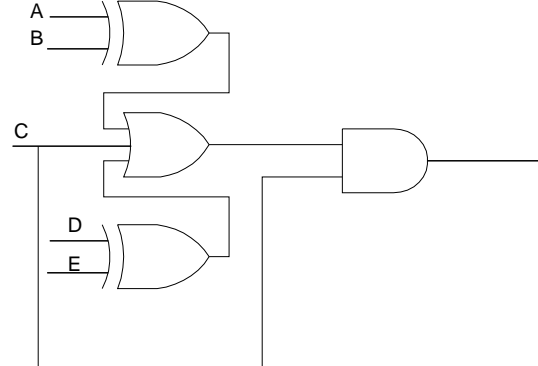
g)



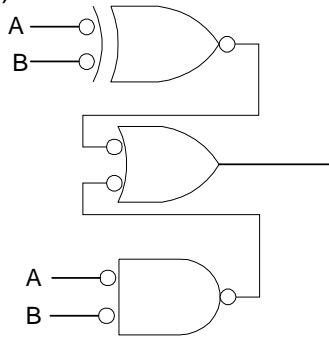
h)



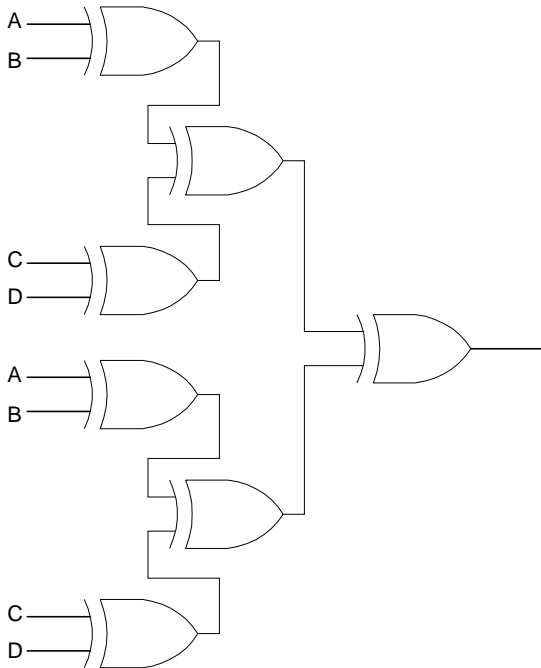
i)



j)



k)



12. Determine a tabela verdade das expressões e desenhe o circuito:

a) $(A + B) \cdot (B + A)$

b) $((A \oplus B) \oplus (A \oplus B)) \oplus (A \oplus B)$

c) $(A \cdot B \cdot C) \oplus (A + B + C)$

d) $\sim (\sim A + B) \cdot \sim B$

e) $(\sim A \cdot B) \oplus (A \cdot \sim B)$

13. Determine a expressões booleana e desenhe o circuito a partir das tabelas verdade:

a)

A	B	C	S
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

b)

A	B	C	D	S
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	1
1	1	1	1	0