

Lista de Exercícios

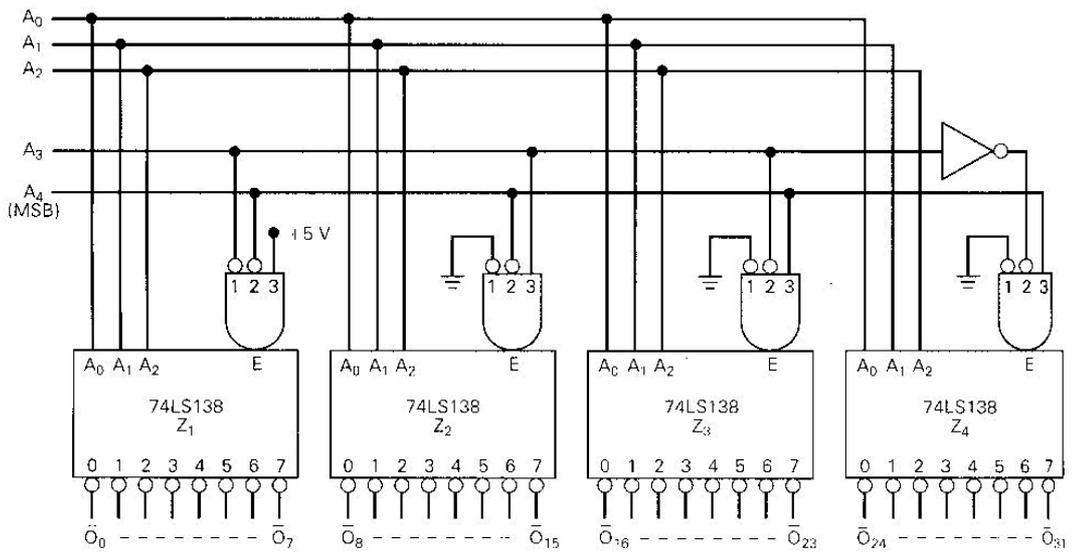
2^a Prova

Circuitos Digitais I

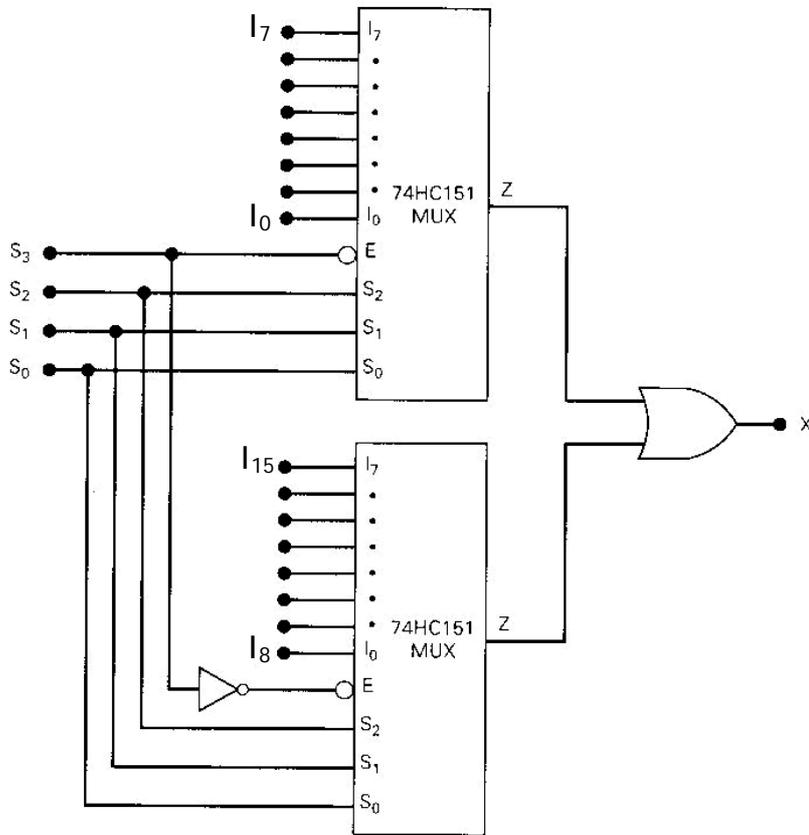
Prof. Fernando Passold

(Respostas)

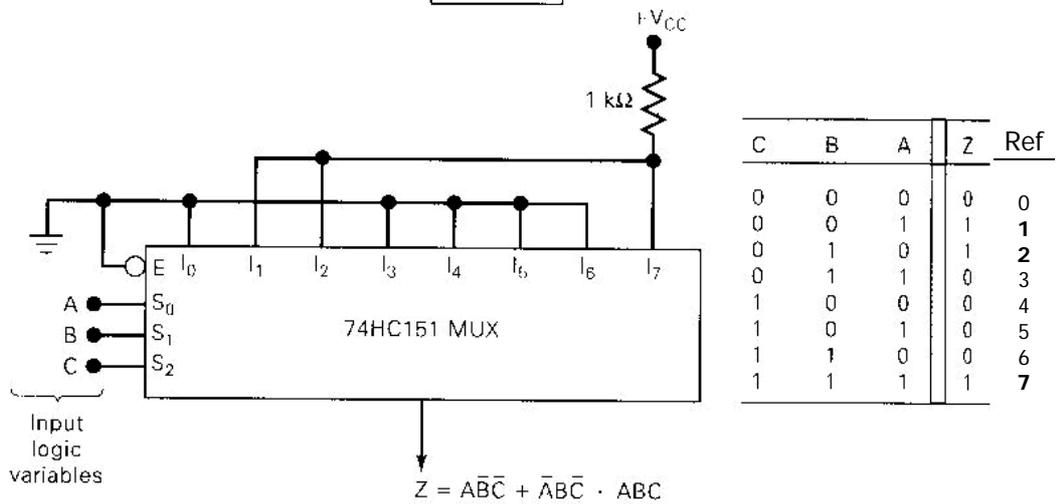
1)



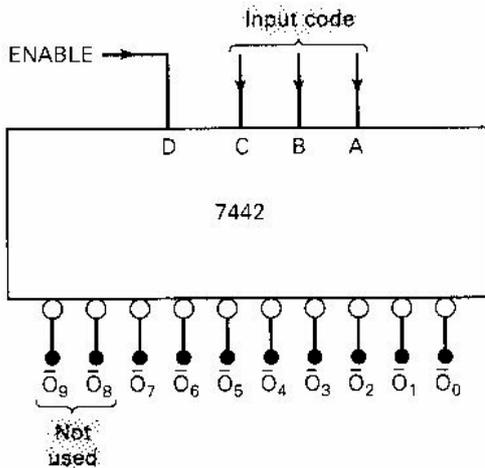
2)



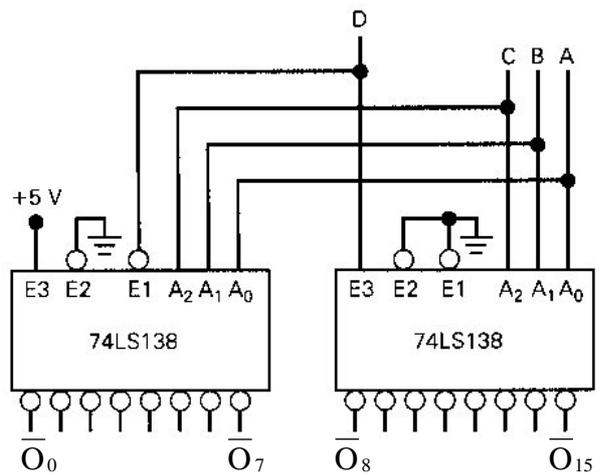
3)



4)



5)

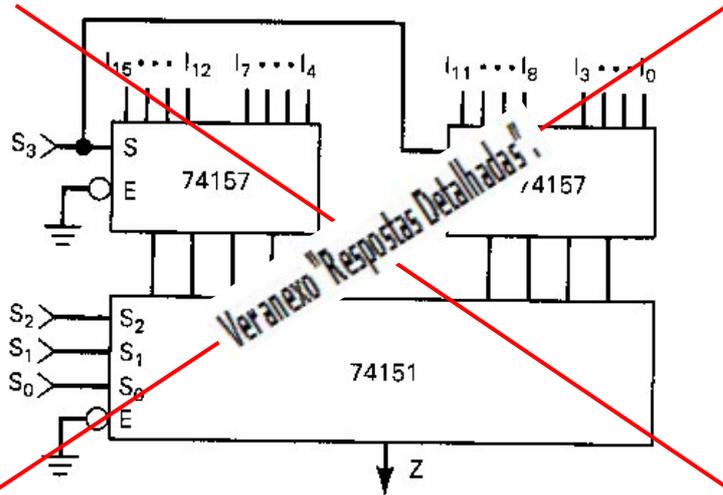


6) E₂ de Z₄ está "emperrado" em nível lógico baixo. Não está "sensível para A₃". Não está reconhecendo A₃.

7) Desempenha a função de um Multiplexador de 4 entradas.

8) Use 9 CIs 74151 ← Ver anexo "Respostas Detalhadas".

9)



10)

A	B	C	
0	0	0	0 → I ₀
0	0	1	0 → I ₁
0	1	0	0 → I ₂
0	1	1	1 → I ₃
1	0	0	0 → I ₄
1	0	1	1 → I ₅
1	1	0	1 → I ₆
1	1	1	1 → I ₇

AC+AB+BC

Ver anexo "Respostas Detalhadas"

11) Conecte I₁, I₅, I₆, I₁₁, I₁₄ e I₁₅ ao +V_{CC}. Todas as outras entradas são conectadas ao GND.

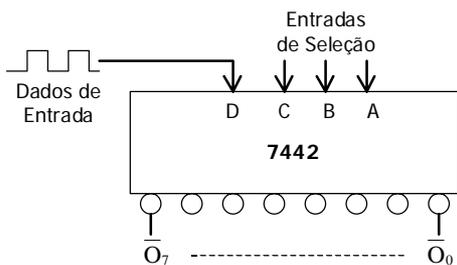
12) Z = ALTO para DCBA = 0010, 0100, 1001 e 1010

13) (b) $Z = \overline{A}BC + A\overline{B}C + \overline{A}B\overline{C} + A\overline{B}\overline{C} + \overline{A}BCD + ABCD$

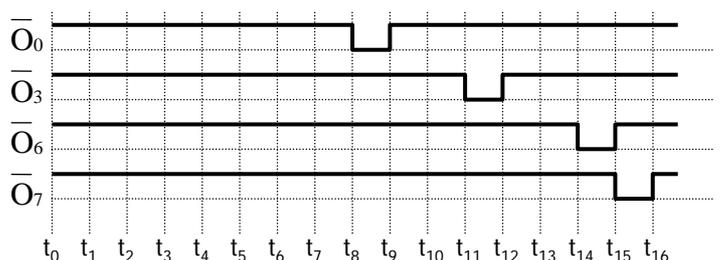
Ver anexo "Respostas Detalhadas"

14) (a) Codificador, MUX (b) MUX, DEMUX (c) MUX (d) Codificador (e) Decodificador, DEMUX (f) DEMUX (g) MUX.

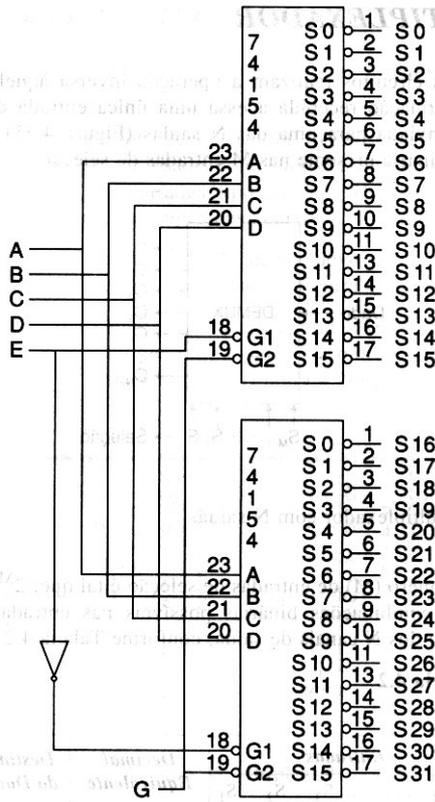
15)



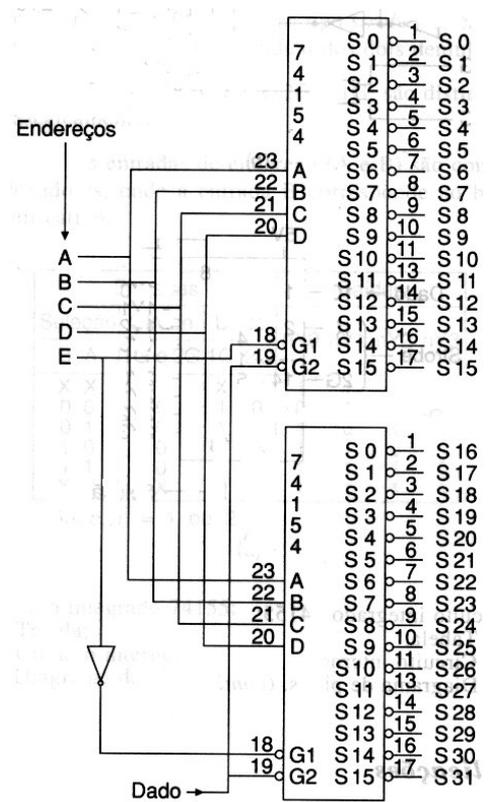
16)



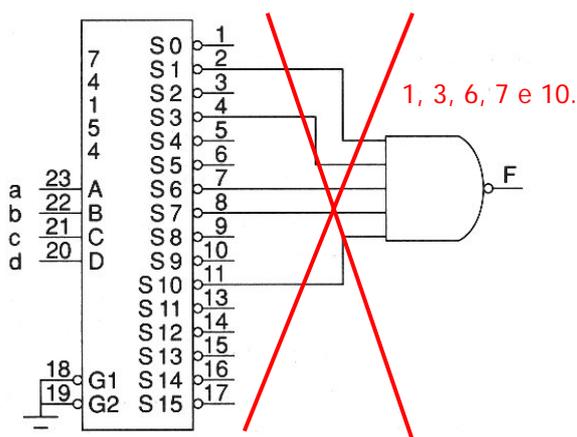
17)



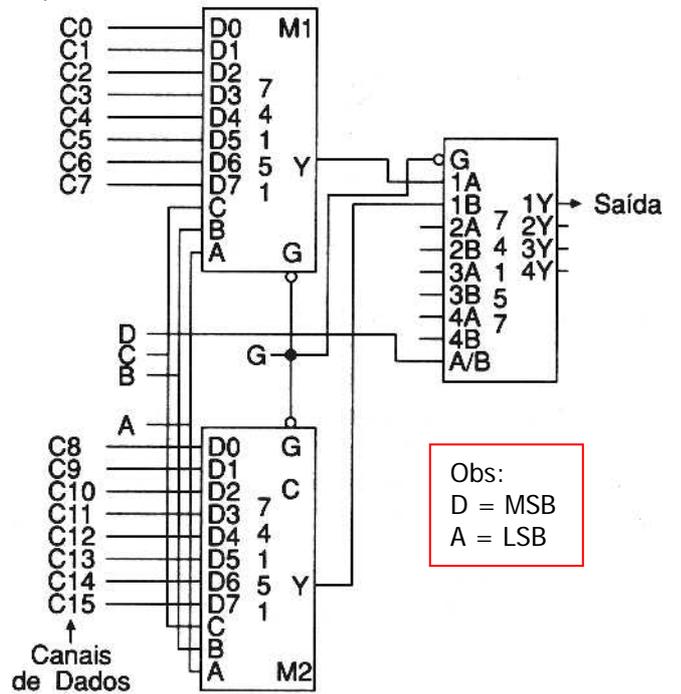
18)



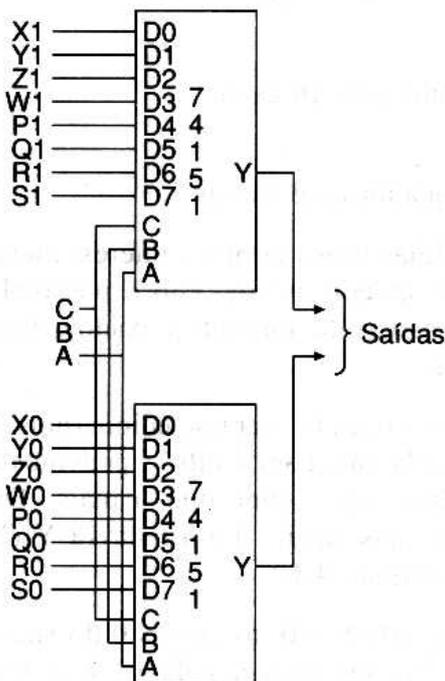
19)



20)



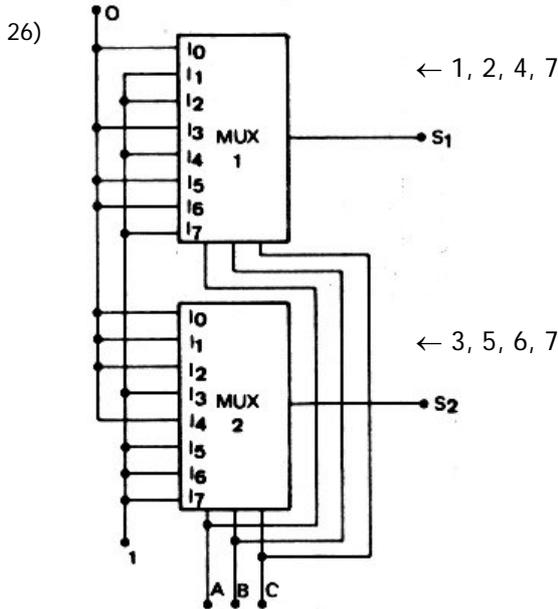
21)



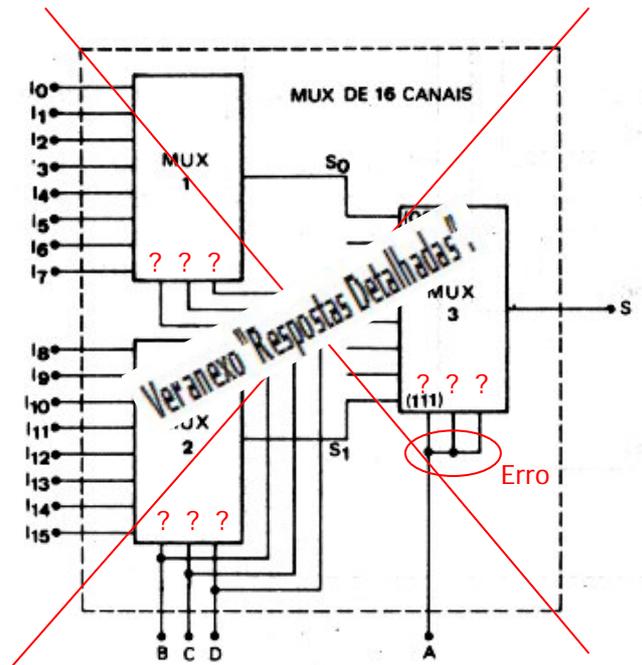
- 22) (a) Está cumprindo o papel de um circuito decodificador de 8 linhas de saída (DEC 3/8).
 (b) Está cumprindo o papel de um circuito decodificador de 16 linhas de saída (DEC 4/16).

23) Cumpre a função de MUX de 16 canais de entrada.

24) Os circuitos (a) e (b) são Multiplexadores de 8 canais de entrada.

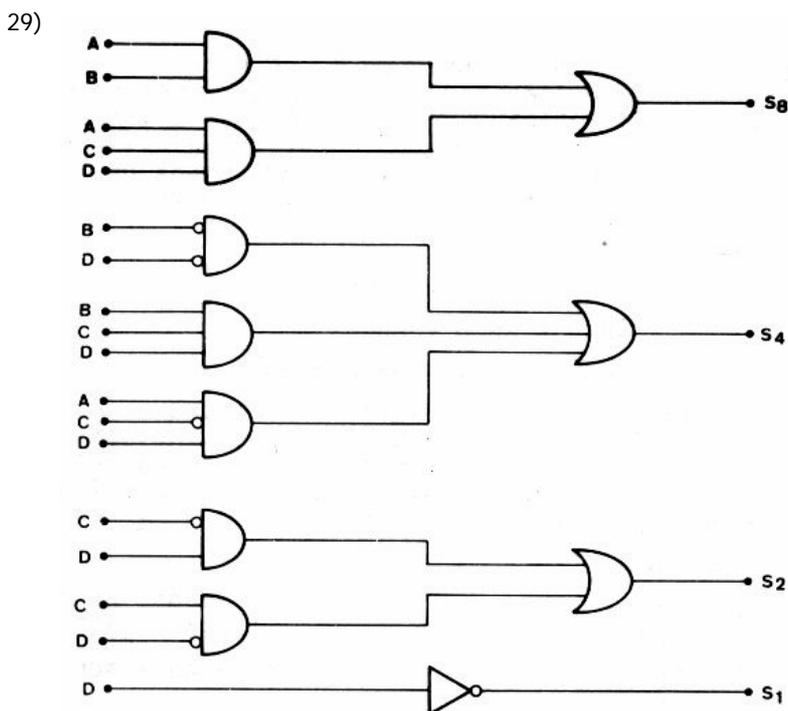
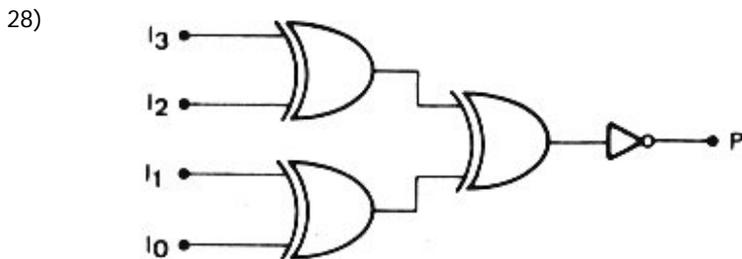


25)



Obs:
 A = MSB
 D = LSB

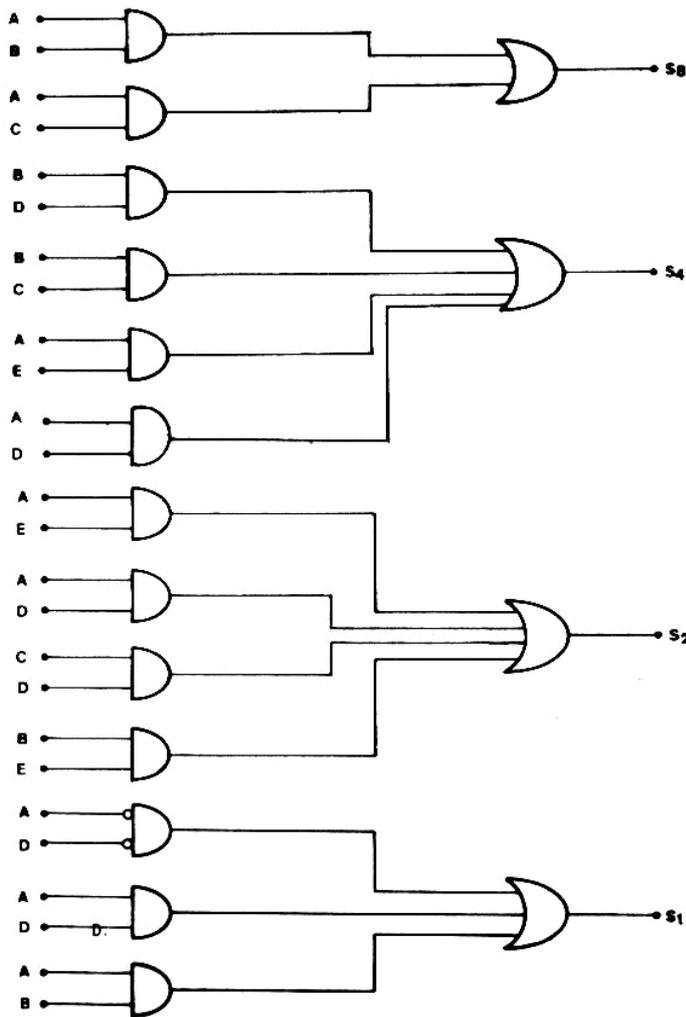
27) Executa o papel de um DEMUX de 8 canais de saída.



(a)

(b)

29) (cont)



(c)

(d)

Fim

Obs:
Favor se reportar ao anexo "Respostas Detalhadas" referente à ERATAS para algumas respostas publicadas anteriormente (extraídas de livros).

ERRATAs 
para Respostas da
Lista de Exercícios da 2a Prova
Circuitos Digitais I

Eng. Elétrica
Prof. Fernando Passold

20 de maio de 2006

2) Resposta da 9a questão (figura 2).

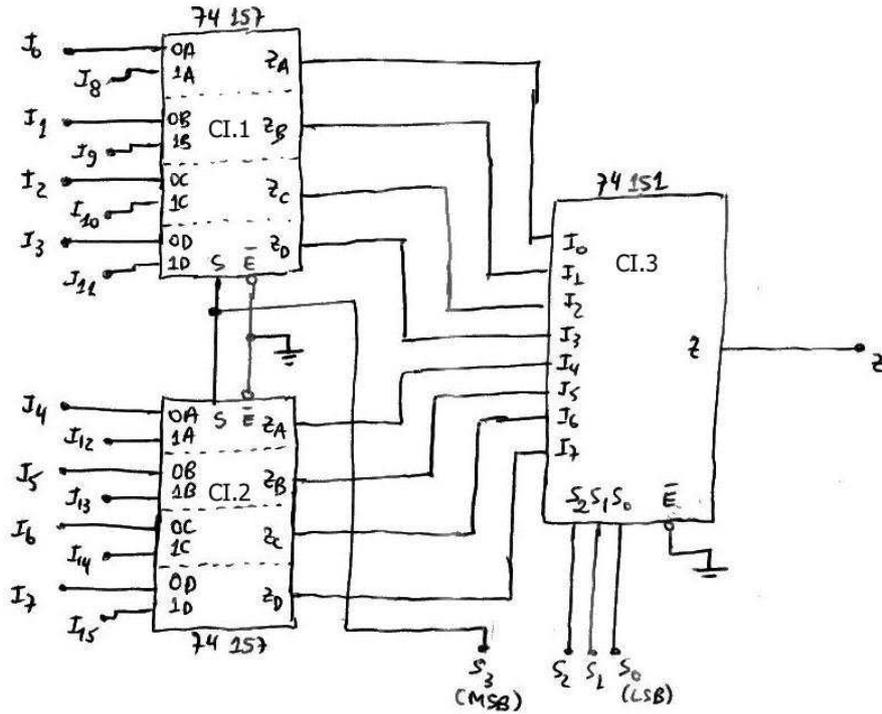


Tabela verdade da seleção dos MUXs:

Ref	S ₃	S ₂	S ₁	S ₀	Z	①	②	③
0	0	0	0	0	I ₀	0A		2A/①
1	0	0	0	1	I ₁	0B		2B/①
2	0	0	1	0	I ₂	0C		2C/①
3	0	0	1	1	I ₃	0D		2D/①
4	0	1	0	0	I ₄		0A/②	2A/②
5	0	1	0	1	I ₅		0B/②	2B/②
6	0	1	1	0	I ₆		0C/②	2C/②
7	0	1	1	1	I ₇		0D/②	2D/②
8	1	0	0	0	I ₈	1A		2A/③
9	1	0	0	1	I ₉	1B		2B/③
10	1	0	1	0	I ₁₀	1C		2C/③
11	1	0	1	1	I ₁₁	1D		2D/③
12	1	1	0	0	I ₁₂		1A/②	2A/②
13	1	1	0	1	I ₁₃		1B/②	2B/②
14	1	1	1	0	I ₁₄		1C/②	2C/②
15	1	1	1	1	I ₁₅		1D/②	2D/②

Número dos CIs habilitados.

Partes selecionadas de cada CI 74157.
Saída desejada para o circuito.

Figura 2: Resposta para 9a questão.

3) Resposta da 10a questão (figura 3).

$$\begin{aligned}
 Z &= AB + BC + AC \\
 Z &= AB(C + \bar{C}) + BC(A + \bar{A}) + AC(B + \bar{B}) \\
 Z &= ABC + AB\bar{C} + \bar{A}BC + A\bar{B}C + A\bar{B}\bar{C} + A\bar{B}C \\
 Z &= ABC + AB\bar{C} + \bar{A}BC + A\bar{B}C \\
 &\quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \\
 &\quad I_7 \quad I_6 \quad I_3 \quad I_5 \\
 &\quad 111 \quad 110 \quad 011 \quad 101
 \end{aligned}$$

Figura 3: Resposta para 10a questão.

4) Resposta da 11a questão (figura 4).

$$Z = \sum m(1, 5, 7, 8, 11, 13, 14, 15)$$

$$Z = \bar{A}\bar{B}\bar{C}D + BCD + A\bar{B}\bar{D} + AB\bar{C}D$$

$$Z = \bar{A}\bar{B}\bar{C}D + (A+\bar{A})BCD + A\bar{B}\bar{D}(C+\bar{C}) + AB\bar{C}D$$

$$Z = \bar{A}\bar{B}\bar{C}D + ABCD + \bar{A}BCD + A\bar{B}C\bar{D} + A\bar{B}\bar{C}\bar{D} + AB\bar{C}D$$

\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow
 $\underbrace{0001}_{I_1}$ $\underbrace{1111}_{I_{15}}$ $\underbrace{0111}_{I_7}$ $\underbrace{1010}_{I_{10}}$ $\underbrace{1000}_{I_8}$ $\underbrace{1101}_{I_{13}}$

<-- Se A for o MSB.

ou

$$Z = \bar{A}\bar{B}\bar{C}D + ABCD + \bar{A}BCD + A\bar{B}C\bar{D} + A\bar{B}\bar{C}\bar{D} + AB\bar{C}D$$

<-- Se A for o LSB.

$$Z = D\bar{C}\bar{B}\bar{A} + DCBA + DCB\bar{A} + \bar{D}C\bar{B}A + \bar{D}\bar{C}\bar{B}A + D\bar{C}\bar{B}A$$

\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow
 $\underbrace{1000}_{I_8}$ $\underbrace{1111}_{I_{15}}$ $\underbrace{1110}_{I_{14}}$ $\underbrace{0101}_{I_5}$ $\underbrace{0001}_{I_1}$ $\underbrace{1011}_{I_{11}}$

Figura 4: Resposta para 11a questão.

5) Resposta da 12a questão (figura 5).

a) Tabela verdade:

Ref	D' C B A	Z
0	0' 0 0 0	0
1	0' 0 0 1	0 (D)
2	0' 0 1 0	1
3	0' 0 1 1	0
4	0' 1 0 0	1 (D)
5	0' 1 0 1	0
6	0' 1 1 0	0
7	0' 1 1 1	0
8	1' 0 0 0	0
9	1' 0 0 1	1 (D)
10	1' 0 1 0	1
11	1' 0 1 1	0
12	1' 1 0 0	0
13	1' 1 0 1	0
14	1' 1 1 0	0
15	1' 1 1 1	0

$$Z = \frac{\bar{D}\bar{C}\bar{B}\bar{A}}{0010} + \frac{\bar{D}C\bar{B}\bar{A}}{0100} + \frac{D\bar{C}\bar{B}A}{1001} + \frac{D\bar{C}\bar{B}\bar{A}}{1010}$$

$$b) Z = \bar{D}\bar{C}\bar{B}\bar{A} + \bar{D}C\bar{B}\bar{A} + D\bar{C}\bar{B}A + D\bar{C}\bar{B}\bar{A}$$

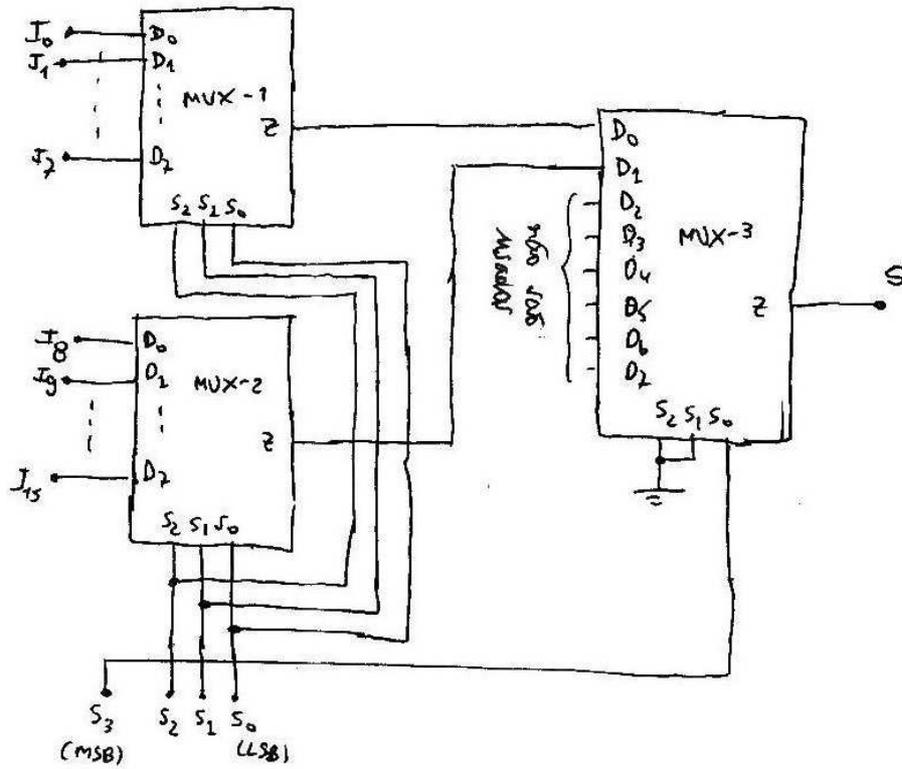
$$Z = \bar{C}\bar{B}\bar{A}(D+\bar{D}) + \bar{D}C\bar{B}A + D\bar{C}\bar{B}A$$

$$Z = \bar{C}\bar{B}\bar{A} + \bar{D}C\bar{B}A + D\bar{C}\bar{B}A$$

Figura 5: Resposta para 12a questão.

7) Resposta da 25a questão (figura 7).

Solução 1)



Solução 2)

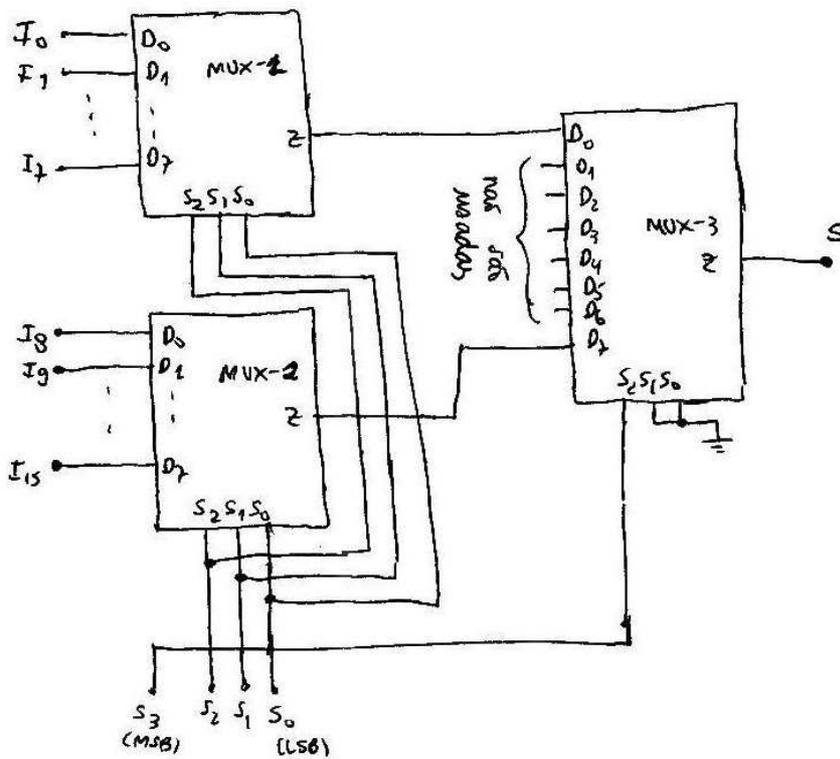


Figura 7: Resposta para 25a questão.

Fim. 🍌