Práctica 17: Circuito de Alarmas

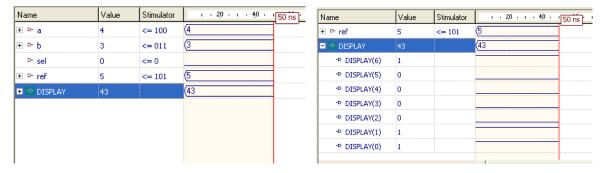Nombre: Colín Ramiro Joel   No. de lista: 3

Código VHD

```vhdl
library ieee;
use ieee.std_logic_1164.all;
entity prac17 is
port(
        a, b, ref: in std_logic_vector(2 downto 0);
        sel: in std_logic;
        DISPLAY: out std_logic_vector(6 downto 0)
);
end prac17;
architecture aprac17 of prac17 is
signal mux: std_logic_vector(2 downto 0);
signal res: std_logic_vector(2 downto 0);
begin
--Multiplexor
        process(a,b,sel)
        begin
                if(sel = '0')then
                        mux <= b;
                elsif(sel = '1')then
                        mux <= a;
                else
                        mux <= "000";
                end if;
        end process;
--Comparador
        res <=    "001" when mux < ref else
                  "010" when mux = ref else
                  "100" when mux > ref;
--Convertidor
        process(res)
        begin
                case res is
                        when "001" => DISPLAY <= "1000011";
                        when "010" => DISPLAY <= "1000001";
                        when "100" => DISPLAY <= "1100001";
                        when others => DISPLAY <= "0000000";
                end case;
        end process;
end aprac17;
```
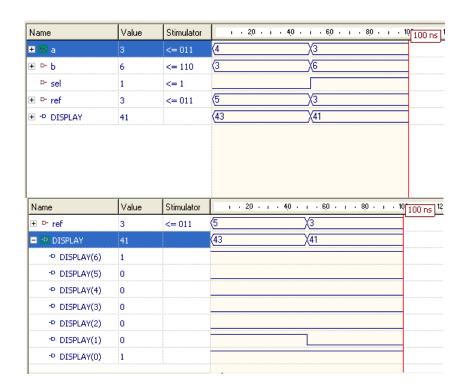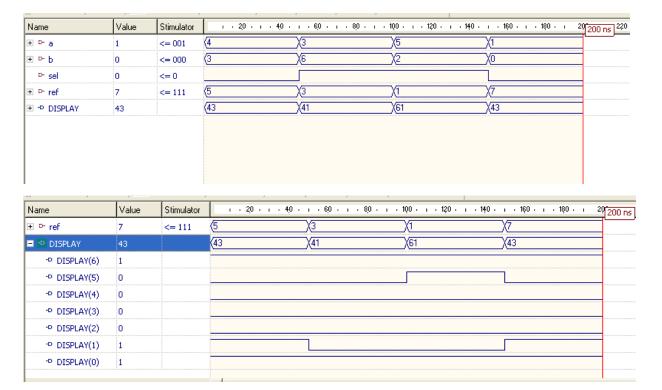
Capturas en Galaxy

a	b	sel	ref
4	3	0	5
3	6	1	3
5	2	1	1
1	0	0	7
0	7	1	4

1.-

Name	Value	Stimulator	20 · 40 · 50 ns
a	4	<= 100	4
b	3	<= 011	3
sel	0	<= 0	
ref	5	<= 101	5
DISPLAY	43		43

Name	Value	Stimulator	20 · 40 · 50 ns
ref	5	<= 101	5
DISPLAY	43		43
DISPLAY(6)	1		
DISPLAY(5)	0		
DISPLAY(4)	0		
DISPLAY(3)	0		
DISPLAY(2)	0		
DISPLAY(1)	1		
DISPLAY(0)	1		

2.-

Name	Value	Stimulator	20 · 40 · 60 · 80 · 10 100 ns
a	3	<= 011	4 / 3
b	6	<= 110	3 / 6
sel	1	<= 1	
ref	3	<= 011	5 / 3
DISPLAY	41		43 / 41

Name	Value	Stimulator	20 · 40 · 60 · 80 · 10 100 ns
ref	3	<= 011	5 / 3
DISPLAY	41		43 / 41
DISPLAY(6)	1		
DISPLAY(5)	0		
DISPLAY(4)	0		
DISPLAY(3)	0		
DISPLAY(2)	0		
DISPLAY(1)	0		
DISPLAY(0)	1		

3.-

Name	Value	Stimulator	20 40 60 80 100 120 140 150 ns
⊞ ⊛ a	5	<= 101	4 / 3 / 5
⊞ ▷ b	2	<= 010	3 / 6 / 2
▷ sel	1	<= 1	
⊞ ▷ ref	1	<= 001	5 / 3 / 1
⊞ ▷ DISPLAY	61		43 / 41 / 61

Name	Value	Stimulator	20 40 60 80 100 120 140 150 ns
⊞ ▷ ref	1	<= 001	5 / 3 / 1
⊟ ▷ DISPLAY	61		43 / 41 / 61
▷ DISPLAY(6)	1		
▷ DISPLAY(5)	1		
▷ DISPLAY(4)	0		
▷ DISPLAY(3)	0		
▷ DISPLAY(2)	0		
▷ DISPLAY(1)	0		
▷ DISPLAY(0)	1		

4.-

Name	Value	Stimulator	20 40 60 80 100 120 140 160 180 200 ns 220
⊞ ▷ a	1	<= 001	4 / 3 / 5 / 1
⊞ ▷ b	0	<= 000	3 / 6 / 2 / 0
▷ sel	0	<= 0	
⊞ ▷ ref	7	<= 111	5 / 3 / 1 / 7
⊞ ▷ DISPLAY	43		43 / 41 / 61 / 43

Name	Value	Stimulator	20 40 60 80 100 120 140 160 180 200 ns
⊞ ▷ ref	7	<= 111	5 / 3 / 1 / 7
⊟ ▷ DISPLAY	43		43 / 41 / 61 / 43
▷ DISPLAY(6)	1		
▷ DISPLAY(5)	0		
▷ DISPLAY(4)	0		
▷ DISPLAY(3)	0		
▷ DISPLAY(2)	0		
▷ DISPLAY(1)	1		
▷ DISPLAY(0)	1		

5.-

Name	Value	Stimulator					
a	0	<= 000	4	3	5	1	0
b	7	<= 111	3	6	2	0	7
sel	1	<= 1					
ref	4	<= 100	5	3	1	7	4
DISPLAY	43		43	41	61	43	

250 ns

Name	Value	Stimulator					
ref	4	<= 100	5	3	1	7	4
DISPLAY	43		43	41	61	43	
DISPLAY(6)	1						
DISPLAY(5)	0						
DISPLAY(4)	0						
DISPLAY(3)	0						
DISPLAY(2)	0						
DISPLAY(1)	1						
DISPLAY(0)	1						

250 ns

Capturas en Proteus

a	b	sel	ref
4	3	0	5
3	6	1	3
5	2	1	1
1	0	0	7
0	7	1	4