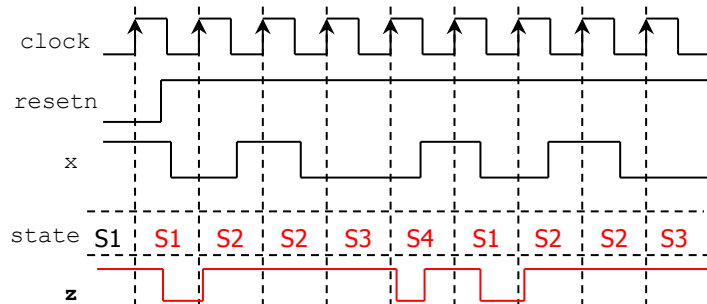
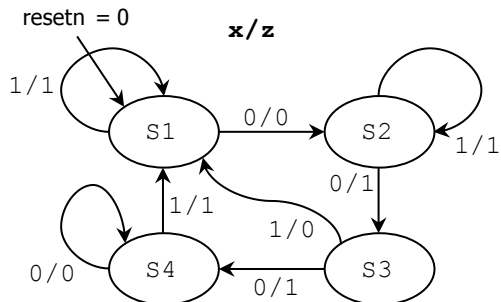


Solutions - Quiz 3

(November 9th @ 5:30 pm)

PROBLEM 1 (30 PTS)

- Complete the timing diagram of the following state machine:



PROBLEM 2 (30 PTS)

- Complete the timing diagram of the circuit whose VHDL description is shown below:

```

library ieee;
use ieee.std_logic_1164.all;

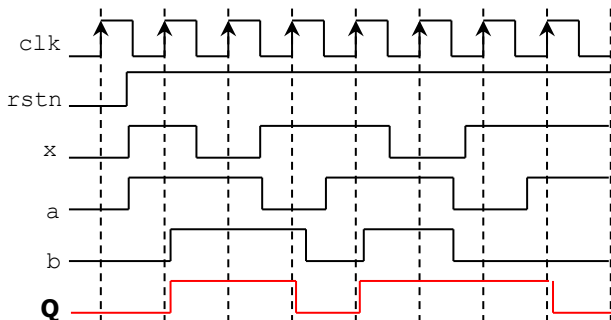
entity circ is
  port ( rstn, a, b, x, clk: in std_logic;
        q: out std_logic);
end circ;
  
```

```

architecture xst of circ is
  signal qt: std_logic;

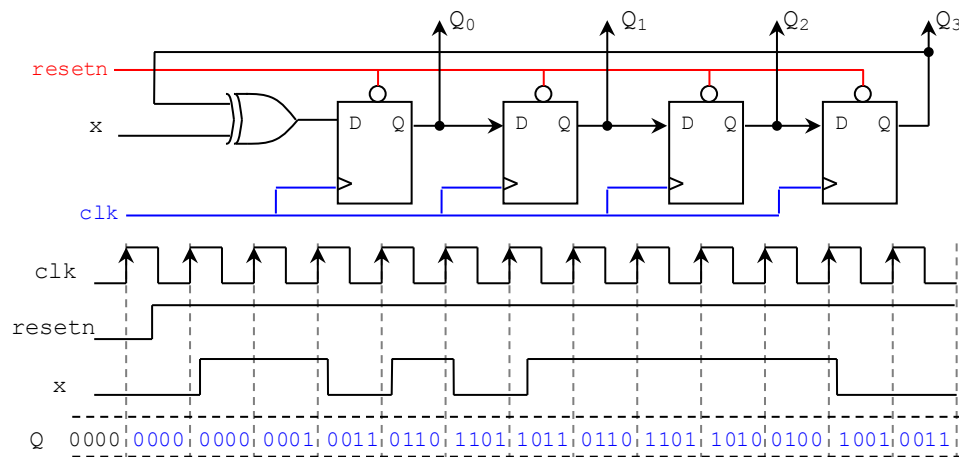
begin

  process (rstn, clk, a, b, x)
  begin
    if rstn = '0' then
      qt <= '0';
    elsif (clk'event and clk = '1') then
      if x = '1' then
        qt <= qt xor (a xor b);
      end if;
    end if;
  end process;
  q <= qt;
end xst;
  
```



PROBLEM 3 (40 PTS)

- Complete the timing diagram of the following circuit. $Q = Q_3Q_2Q_1Q_0$



- Get the excitation equation for Q_0 (5 pts).
 $Q_0(t+1) \leftarrow x \oplus Q_3(t)$