Solutions - Quiz 3
(March 17th @ 5:30 pm)

PROBLEM 1 (30 pts)
- Complete the timing diagram of the circuit whose VHDL description is shown below:

```vhdl
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 <= a xor b;
        end if;
      end if;
    end process;
    q <= qt;
  end xst;
end circ;
```

![Timing Diagram for Problem 1](image)

PROBLEM 2 (30 pts)
- Complete the timing diagram of the following state machine:

![State Machine Diagram for Problem 2](image)

PROBLEM 3 (40 pts)
- Complete the timing diagram of the following circuit. \( Q = Q_3Q_2Q_1Q_0 \)

![Circuit Diagram for Problem 3](image)