Solutions - Quiz 1
(September 20\textsuperscript{th} @ 5:30 pm)

PROBLEM 1 (40 PTS)
- The following is the timing diagram of a logic circuit with three inputs. Simplify the Boolean expression of the circuit and sketch the minimized circuit.

\[ f = \overline{a}b + bc \]

PROBLEM 2 (30 PTS)
- Complete the timing diagram of the logic circuit whose VHDL description is shown below:

\begin{verbatim}
library ieee;
use ieee.std_logic_1164.all;

entity test is
  port ( a, b, c : in std_logic;
          f : out std_logic);
end test;

architecture struct of test is
  signal y : std_logic;
begin
  y <= not(a) xor c;
  f <= y xnor b;
end struct;
\end{verbatim}

PROBLEM 3 (30 PTS)
- Complete the timing diagram of the digital circuit shown below. You must consider the propagation delays. Assume the propagation delay of every gate is 5 ns. The initial values of all signals are plotted in the figure.