Assignment (due Nov. 9)  

1. Work through Example 10 on pages 67–71 of PSpice for Basic Circuit Analysis by Tront. Specifically:

   (a) Solve for the loop current of the circuit in Fig. 65 for \( t > 0 \) “by hand.” Solve for the time at which the loop current has reached \( \frac{1}{2} \) of its initial value from this solution. In MATLAB, plot the loop current for \( 0 \leq t \leq 50 \mu s \).

   (b) Draw the circuit of Fig. 65 in OrCAD Capture.

   (c) Run a transient-analysis PSpice simulation for \( 0 \leq t \leq 50 \mu s \).

   (d) Produce output in the form of Fig. 67 showing the plot of the current for \( 0 \leq t \leq 50 \mu s \).

   (e) Using the Probe Cursor, determine the time that the loop current reaches \( \frac{1}{2} \) of its initial value and compare to the result for the same that you obtained in (a).

   You are required to turn in your manual calculations of the loop current, your MATLAB plot, and a printout of the result of step (d).

2. Consider the circuit below.

   ![Circuit Diagram]

   (a) Find the differential equation for \( v(t) \) for \( t > 0 \) “by hand.”

   (b) Find the complete solution for \( v(t) \) for \( t > 0 \); this will require finding \( v(0^+) \), \( v(\infty) \), and \( \frac{dv(t)}{dt} \bigg|_{t=0^+} \).

   (c) In MATLAB, plot \( v(t) \) from (a) for \( 0 \leq t \leq 50 \) s.

   (d) Find the time at which \( v(t) \) is maximum.

   (e) Find \( v(t) \) using OrCAD Capture plus PSpice simulation. Use the Probe Cursor to find the time that \( v(t) \) is maximum.

   You are required to turn in your manual calculations, your MATLAB plot, and a printout of \( v(t) \) for \( 0 \leq t \leq 50 \) s from OrCAD simulation.