MASSACHVSETTS INSTITVTE OF TECHNOLOGY

Department of Electrical Engineering and Computer Science

6.002 – Electronic Circuits

Problem Set 12

Issued: 29 November 2001 Due: 7 December 2001

Reading: A&L Chapter 12 for Tue. 27 Nov. and Wed. 28 Nov.
A&L Chapter 17 for Thu. 29 Nov. and Fri. 30 Nov.

Reminder: Good approximations often simplify the math needed for a solution.
Problems:

1. A&L Exercise 1, pages 740 and 741.
   Note that this problem does NOT refer to Figure 12.26.
2. A&L problem 4, pages 744 and 745.
3. A&L problem 5, parts 2 and 3, page 745.
4. For the circuit shown in Figure 1. Provide a labeled sketch of $v_O(t)$ for the three conditions listed below?
   a) Assume RC is much greater than 1.
   b) Assume RC is much less than 1.
   c) Assume RC = 1.

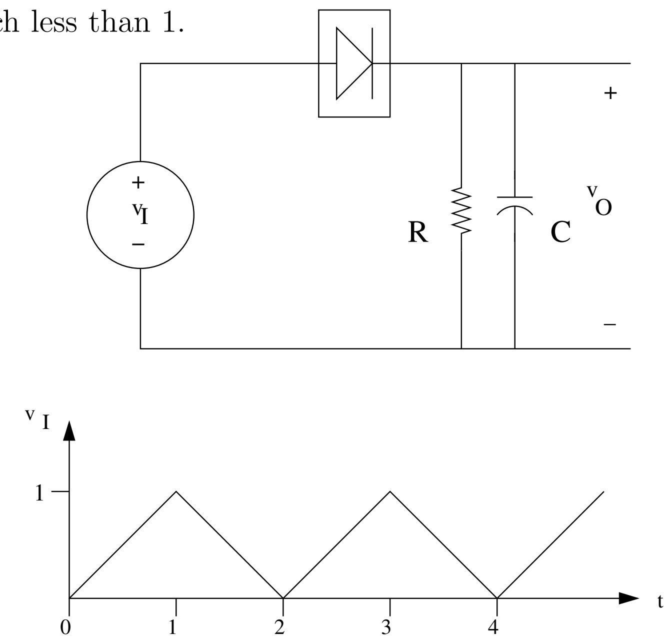

Figure 1: Peak Detector

5. You are given that $v_I(t) = 12\sin 120\pi t$ and $RC = 1/6$.
Consider the circuit shown in Figure 2.

a) Assume that the diodes are ideal and find $v_O(t)$, $i_R(t)$, and provide a labeled sketch of $i_C(t)$.

b) Repeat part a for the case when the diodes are ideal, but they do not turn on until the forward voltage is 0.6 volts.

c) Repeat part a when the diodes are as in part b except that R_{ON} is 0.1 R.

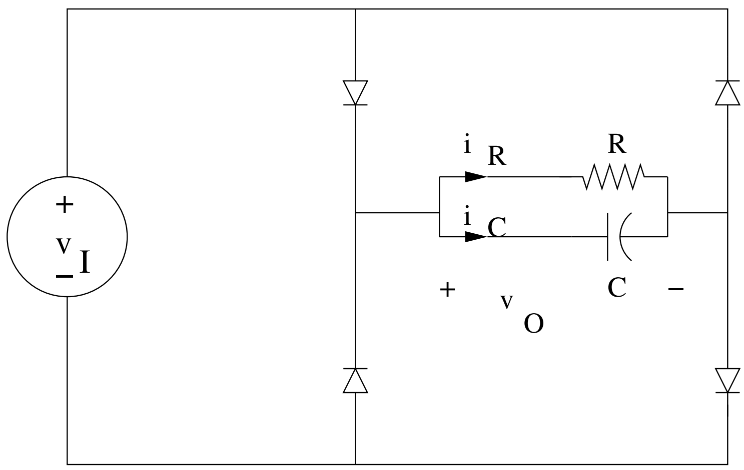

Figure 2: Capacitor Input Power Supply