

24-352 DYNAMIC SYSTEMS & CONTROL

HOMEWORK ASSIGNMENT # 7

DUE 3/7/01

PROBLEMS

1. Use the current and voltage laws to derive the governing differential equations for the circuits shown in Figures P5.1, P5.7, P5.11 and P5.12 in the text book (pages 182 – 184).
2. Use the impedance approach discussed in class to find the impedance of the circuits of problem 1 above. That is, find the ratio of the Laplace transform of the voltage drop across the source to the Laplace transform of the current flowing through the source. $\frac{E(s)}{I(s)}$
(Indicate the direction of the current flow in the circuit).
3. a) For the circuit in problem 5.7 find the Laplace transform of the output voltage e_o when the input voltage is the step function $e_i(t) = 3 H(t)$.
b) What are the location of the poles?
c) Can you use the final value theorem to determine the limit of $e_o(t)$ as t goes to infinity? If so, what is the limit?