HW#1 to be **GRADED** (ENEE 610) due on September 24, 2001 (HJ/RWN 09/16/01)

1. Point out those functions which are positive real; specify your reasons. Also point out those which are reactance functions if they exist.

(1) $y(s)=\dfrac{s+2}{s^3+s^2+3s+12}$ (2) $z(s)=\dfrac{s^2-5s+7}{s^3+s^2+3s+12}$

(3) $y(s)=\dfrac{s^2+6s-7}{s^3-s^2+3s-3}$ (4) $z(s)=\dfrac{s+7}{s^4+5s^2}$

(5) $y(s)=\dfrac{s^3+5s+7}{s^4+12s^2+36}$ (6) $z(s)=\dfrac{s^3+5s}{s^2+12s+7}$

(7) $y(s)=\dfrac{s^2+7}{s^2+12s+7}$ (8) $z(s)=\dfrac{s^2+7}{s^3+9s}$

2. For those reactance functions in the above problem, synthesize them by the 1st and 2nd Cauer methods.

3. Determine the values of a for which the following is a positive real function. Among those determine a for y(s) to be an RC driving point admittance and for these a synthesize the following function as the driving-point admittance of an RC network using the 2nd Foster realization.

$$y(s)=\frac{s(s+3)(s+8)}{(s+2)(s+a)}$$