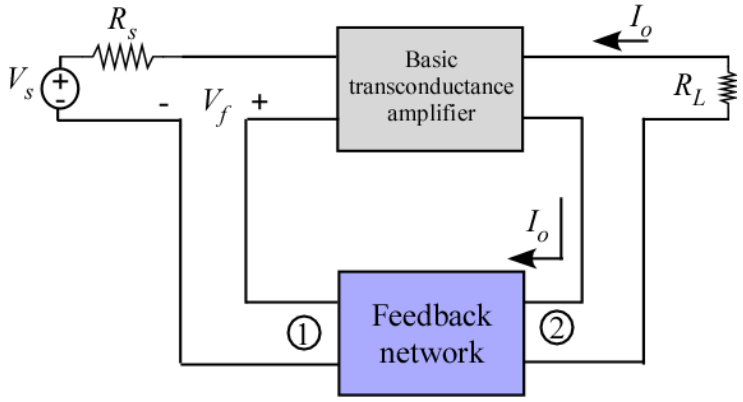
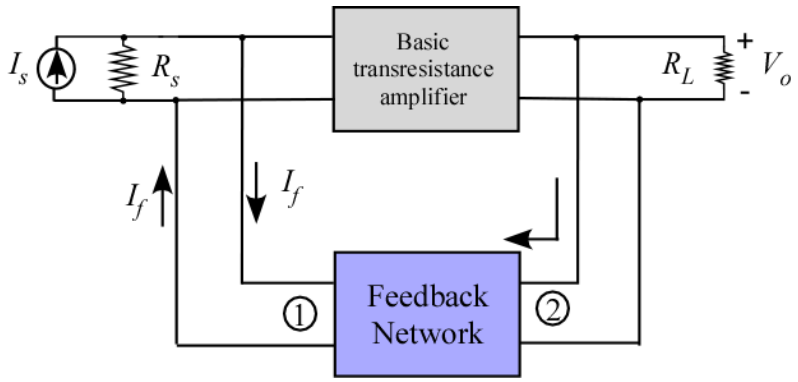
ECE 342: Electronic Circuits **Summer 2026**
Problem Set #10 **Due Date: 5pm, Tue, July 28, 2026**

1. A series-series feedback circuit representable by the figure below and using an ideal transconductance amplifier operates with V_s = 100 mV, V_f = 95 mV and I_o = 10 mA. What are the corresponding values of A and β? Include the correct units for each.



2. A shunt-shunt feedback circuit representable by the figure below and using an ideal transresistance amplifier operates with I_s = 100 μA, I_f = 95 μA, and V_o = 10 V. What are the corresponding values of A and β? Include the correct units for each.



3. Negative feedback is to be used to modify the characteristics of a particular amplifier for various purposes. Identify the feedback topology to be used if:

(a) Input resistance is to be lowered and output resistance raised .

(b) Both input and output resistances are to be raised.

(c) Both input and output resistances are to be lowered.

4. If the feedback factor $\beta = 0.5$ and the phase margin is equal to 30 degrees, determine the magnitude and phase of the closed loop gain $A_f(\omega)$ at frequency ω_1 where the magnitude of the loop gain is unity, i.e, $\left|\beta A(\omega_1)\right| = 1$.

5. If the feedback factor $\beta = 0.5$ and the gain margin is equal to 20 dB, determine the magnitude and phase of the closed loop gain $A_f(\omega)$ at the frequency ω_{180} where the phase of the loop gain is -180 degrees.