1) (25) Consider the circuit below.

a) Find the Thevenin equivalent circuit (i.e. Thevenin voltage and Thevenin impedance) from terminals a to b.

b) Determine the impedance $Z_L$ from terminals a to b that will result in the largest average power delivered to $Z_L$. Calculate this maximal average power delivered to $Z_L$. 

![Circuit Diagram]
2) (24) For each of the following two circuits find the transfer function and step response.

a) \( H(s) = \frac{I_o(s)}{I_i(s)}. \)
b) $H(s) = \frac{V_o(s)}{V_i(s)}$. 
3) (27) Consider the circuit below with input voltage $V$ and output voltage $G$. Other voltages are given by $D$, $E$, and $F$.

a) Write matlab code to determine the transfer function $H(s) = G(s)/V(s)$. Do not solve for the transfer function. (Hint: Write four node equations to solve for voltages $D$, $E$, $F$, and $G$.)

b) Determine the value of the transfer function $H(s)$ at very high and very low frequencies from physical arguments.
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2) (24) For each of the following two circuits find the transfer function and step response.

a) \( H(s) = I_o(s)/I_i(s) \).
b) \( H(s) = \frac{V_o(s)}{V_i(s)} \).
3) (27) Consider the circuit below with input voltage $V$ and output voltage $F$. Other voltages are given by $D$, $E$, and $G$.

a) Write matlab code to determine the transfer function $H(s) = F(s)/V(s)$. Do not solve for the transfer function. (Hint: Write four node equations to solve for voltages $D$, $E$, $F$, and $G$.)

b) Determine the value of the transfer function $H(s)$ at very high and very low frequencies from physical arguments.