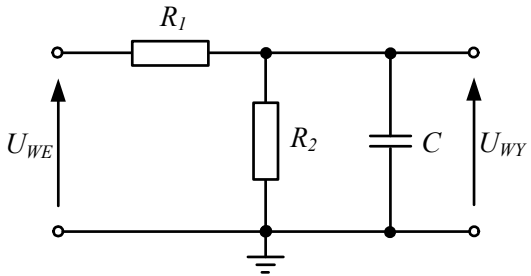
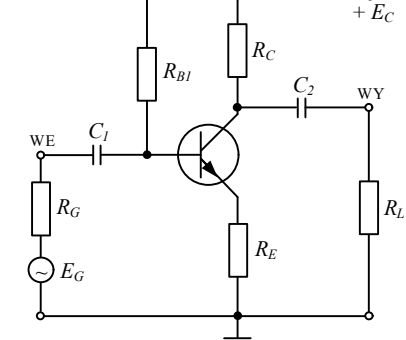
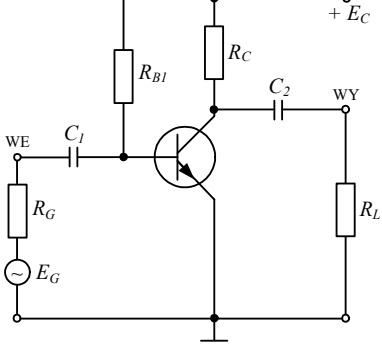
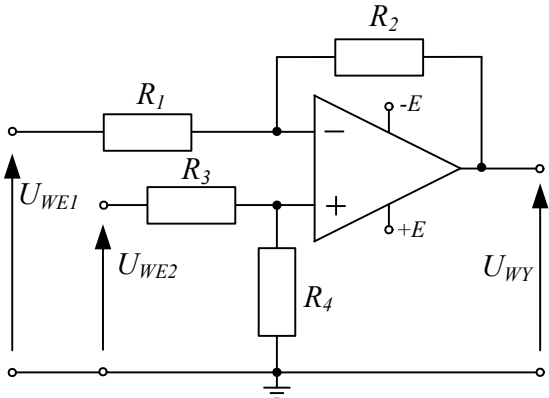
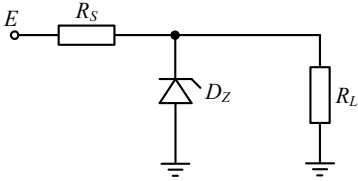
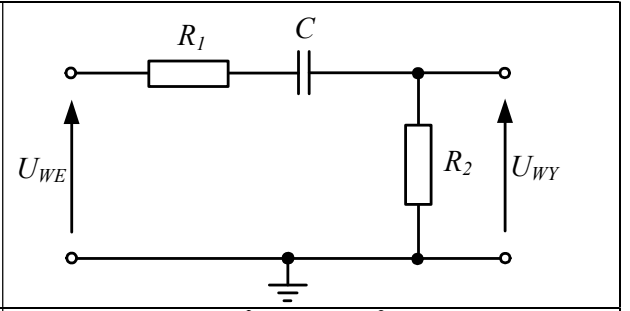
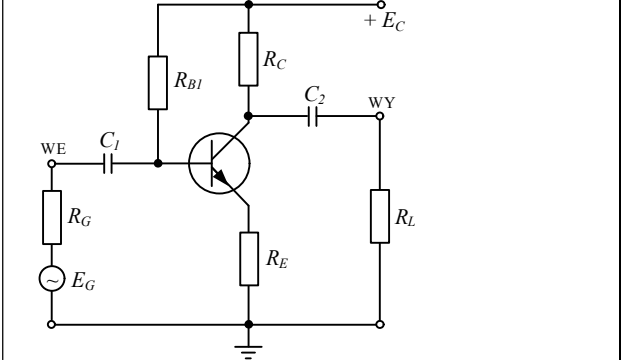
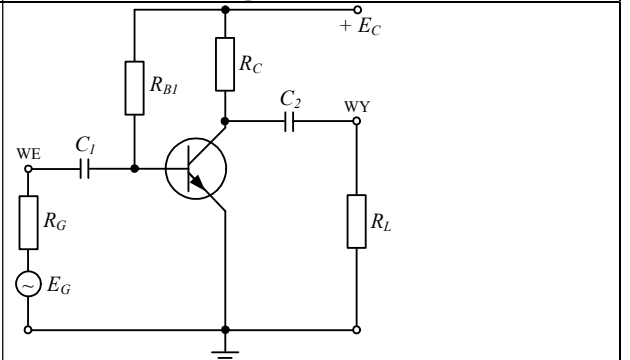
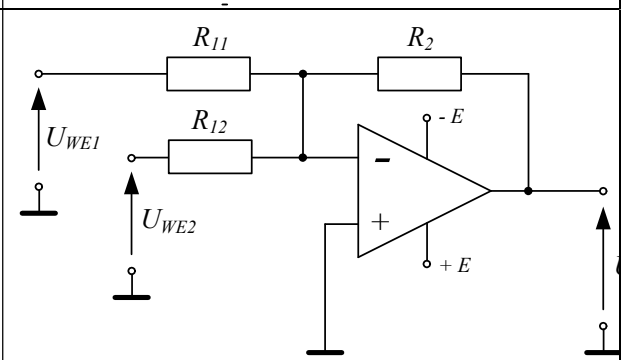
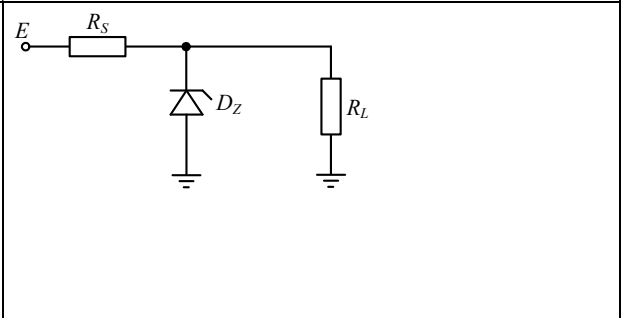


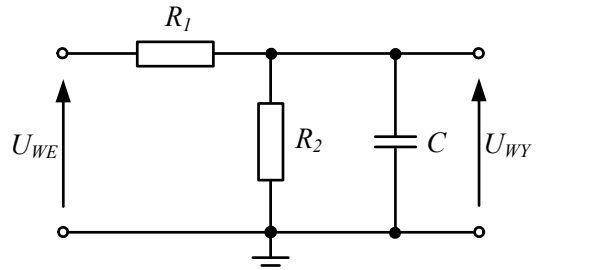
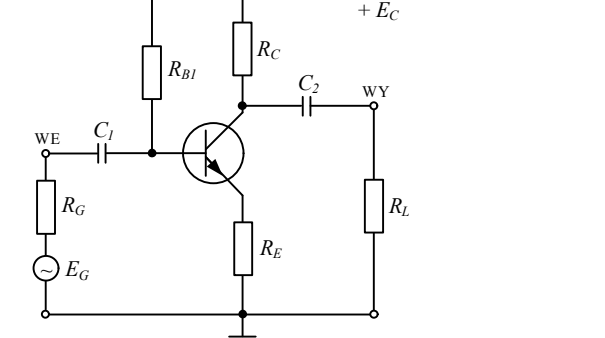
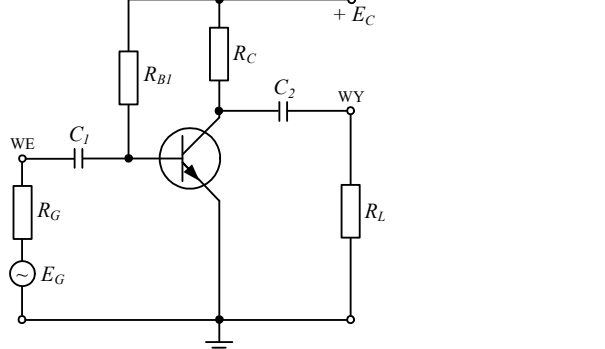
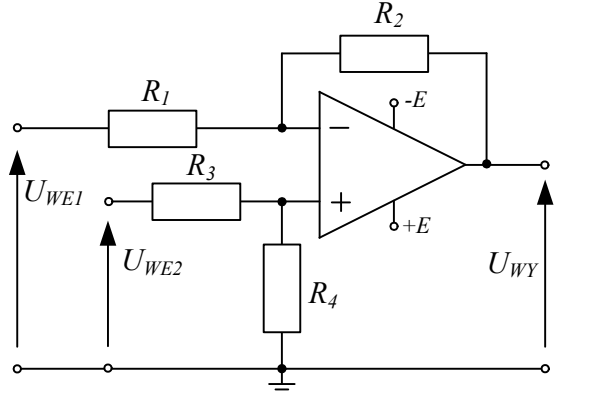
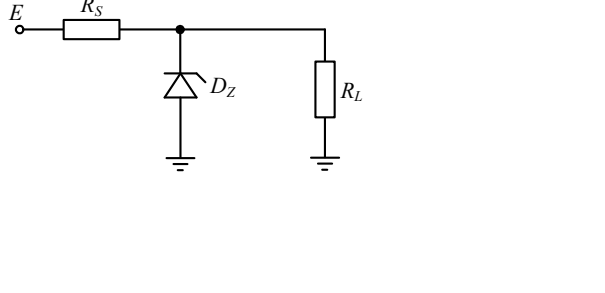
Set A

<p>Task 1</p> <p>Sketch the frequency characteristics (amplitude and phase) for the system in the figure. Plot the amplitude characteristics in dB, and the phase characteristics in degrees with a logarithmic frequency scale. Estimate the 3 dB value of the system's cutoff frequency. For calculations, assume: $R_1 = R_2 = 2k\Omega$, $C = 910pF$.</p>	
<p>Task 2</p> <p>Estimate the operating point of the transistor (I_{CQ}, $U_{(CE)(Q)}$) working in the circuit as shown in Fig. For calculations assume: $R_C = 3.3k\Omega$, $R_{B1} = 510k\Omega$, $R_E = 100\Omega$, $E_C = +12V$, $\beta = 100$, $U_{BE} = 0.65V$.</p>	
<p>Task 3</p> <p>Estimate the effective voltage gain of the circuit in Fig. For calculations, assume: $R_{B1} = 720 k\Omega$, $R_C = 4.7 k\Omega$, $R_G = 4.7k\Omega$, $R_L = 6.8 k\Omega$, $\beta = 100$, $E_C = 15V$ transistor operating point $I_{CQ} = 2 mA$, $U_{(CEQ)} = 5.6V$, $\phi_T = 25mV$, Early voltage $U_A = 100V$.</p>	
<p>Task 4</p> <p>In the circuit in the figure, assuming ideal WO parameters, calculate the output voltage of the circuit, with $R_1 = 10k$, $R_2 = 30k$, $R_3 = 30k$, $R_4 = 30k$, $U_{we1} = 2V$, $U_{(we2)} = 2V$.</p>	
<p>Task 5</p> <p>In the circuit, assume $R_S = 750\Omega$, $R_L = 1k\Omega$, $E = 18V$ and a Zener diode with parameters: $V_Z = 6V$, $I_{Zmin} = 3mA$.</p> <ol style="list-style-type: none"> Assuming the dynamic resistance of the diode $R_Z = 0\Omega$, estimate the diode current, How will the output voltage in the stabilizer change when the input voltage E changes from 20 to 25V assuming $R_Z = 25\Omega$? 	

Set B

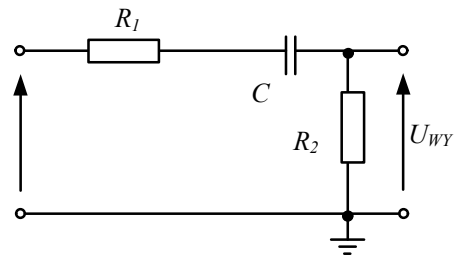
<p><u>Task 1</u></p> <p>For the circuit in the figure, sketch the frequency characteristics (amplitude and phase) for a logarithmic frequency scale. Plot the amplitude characteristics in dB, and the phase characteristics in degrees. Estimate the 3 dB value of the system's cutoff frequency. For calculations, assume: $R_1 = R_2 = 3k$, $C = 1nF$.</p>	
<p><u>Task 2</u></p> <p>Estimate the operating point of the transistor (I_{CQ}, U_{CEQ}) in Fig. For calculations assume: $R_C = 3k\Omega$, $R_{B1} = 560k\Omega$, $R_E = 120\Omega$, $E_C = +15V$, $\beta = 100$, $U_{BE} = 0.65V$.</p>	
<p><u>Task 3</u></p> <p>Estimate the effective voltage gain of the amplifier circuit. For the calculation, assume: $R_{B1} = 910k\Omega$, $R_C = 6.3 k\Omega$, $R_G = 4.7\Omega$, $R_L = 9k\Omega$, $\beta = 100$, $E_C = 12V$ transistor operating point $I_{CQ} = 1.5mA$, $U_{(CEQ)} = 4.3 V$, $\phi_T = 25mV$, Early voltage $U_A = 100V$.</p>	
<p><u>Task 4</u></p> <p>In the circuit in the figure, assuming ideal WO parameters, estimate the output voltage when $R_{11} = 10 k\Omega$, $R_{12} = 20 k\Omega$, $R_2 = 40 k\Omega$, $U_{we1} = 2V$, $U_{we2} = -2V$</p>	
<p><u>Task 5</u></p> <p>In the circuit in the figure, $R_S = 820\Omega$, $E = 20V$, $I_{RL} = 4mA$ and a Zener diode with a voltage: $V_Z = 8V$, $I_{Zmin} = 3mA$</p> <ol style="list-style-type: none"> Estimate the diode current assuming the dynamic resistance of the diode $R_Z = 0, \Omega$ How will the output voltage in the stabilizer change with changes in load current (I_L) from 2 to 5mA and assuming $R_Z = 30\Omega$? 	

Set C

<p>Task 1</p> <p>Sketch the frequency characteristics (amplitude and phase) for the system in the figure. Plot the amplitude characteristics in dB, and the phase characteristics in degrees with a logarithmic frequency scale. Estimate the 3 dB value of the system's cutoff frequency. For calculations, assume: $R_1 = R_2 = 2k\Omega$, $C = 910pF$.</p>	
<p>Task 2</p> <p>Estimate the operating point of the transistor (I_{CQ}, $U_{(CE)(Q)}$) working in the circuit as shown in Fig. For calculations, assume: $R_C = 3.3k\Omega$, $R_{B1} = 510k\Omega$, $R_E = 150\Omega$, $E_C = +12V$, $\beta = 100$, $U_{(BE)} = 0.65V$.</p>	
<p>Task 3</p> <p>Estimate the effective voltage gain of the circuit in Fig. For the calculation, assume: $R_{B1} = 720k\Omega$, $R_C = 4.7k\Omega$, $R_G = 4.7k\Omega$, $R_L = 5.1k\Omega$, $\beta = 100$, $E_C = 16V$ transistor operating point $I_{CQ} = 1.3mA$, Early voltage $U_A = 100V$, $U_{(CEQ)} = 5.6V$, $\phi_T = 25mV$</p>	
<p>Task 4</p> <p>In the circuit in the figure, assuming ideal WO parameters, calculate the output voltage of the circuit, with $R_1 = 10k$, $R_2 = 20k$, $R_3 = 20k$, $R_4 = 10k$, $U_{(we)(1)} = 1V$, $U_{(we)(2)} = 3V$.</p>	
<p>Task 5</p> <p>In the circuit, assume $R_{(S) 810} = \Omega$, $R_L = 1.8k$, $E = 20V$ and a Zener diode with parameters: $V_Z = 6V8$, $I_{Zmin} = 5mA$.</p> <p>c) Assuming the dynamic resistance of the diode $R_Z = 0\Omega$, estimate the diode current,</p> <p>d) How will the output voltage in the stabilizer change when the input voltage E changes from 20 to 24V assuming $R_z = 15\Omega$?</p>	

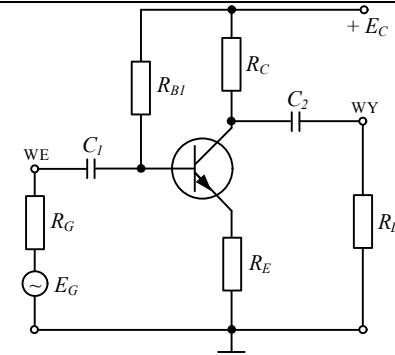
Task 1

For the circuit in the figure, sketch the frequency characteristics (amplitude and phase) for a logarithmic frequency scale. Plot the amplitude characteristics in dB, and the phase characteristics in degrees. Estimate the 3 dB value of the system's cutoff frequency. For calculations, assume: $R_1 = R_2 = 2k\Omega$, $C = 1nF$.



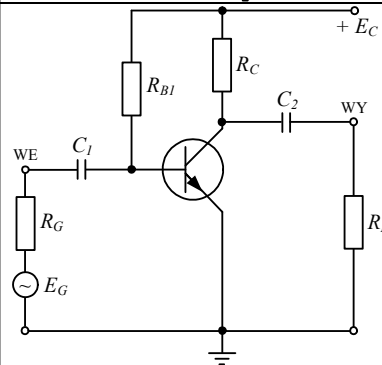
Task 2

Estimate the operating point of the transistor (I_{CQ} , U_{CEQ}) in Fig. For calculations, assume: $R_C = 3k\Omega$, $R_{B1} = 560k\Omega$, $R_E = 100\Omega$, Early voltage $U_A = 100V$, $E_C = +15V$, $\beta = 100$, $U_{BE} = 0.65V$.



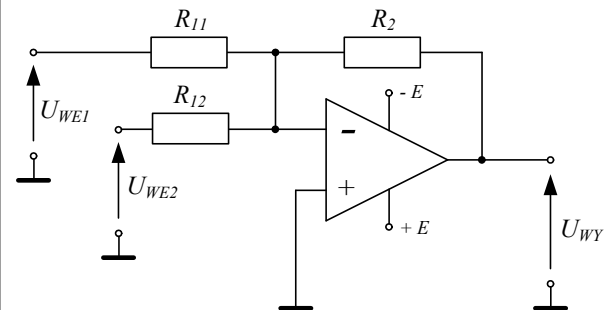
Task 3

Estimate the effective voltage gain of the amplifier circuit. For the calculation, assume: $R_{B1} = 910k\Omega$, $R_C = 6.8k\Omega$, $R_G = 5.1k\Omega$, $R_L = 10k\Omega$, $\beta = 100$, $E_c = 12V$ transistor operating point $I_{CQ} = 1.2mA$, $U_{CEQ} = 4.3V$, Early voltage $U_A = 100V$, $\phi_{(T)} = 25mV$



Task 4

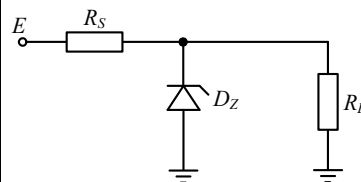
In the circuit in the figure, assuming ideal WO parameters, estimate the output voltage when $R_{11} = 10k\Omega$, $R_{12} = 30k\Omega$, $R_2 = 30k\Omega$, $U_{we1} = -2V$, $U_{we2} = 2V$



Task 5

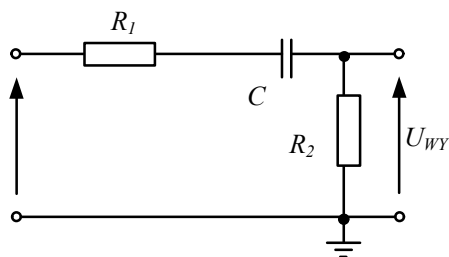
In the circuit in the figure, $R_{(S)} = 810\Omega$, $E = 22V$, $I_{RL} = 5mA$ and a Zener diode with a voltage: $V_Z = 8V$, $I_{Zmin} = 3mA$

- c) Estimate the diode current assuming the dynamic resistance of the diode $R_Z = 0\Omega$
- d) How will the output voltage in the stabilizer change when varying the load current (I_L) from 6 to 10mA and assuming $R_Z = 25\Omega$?



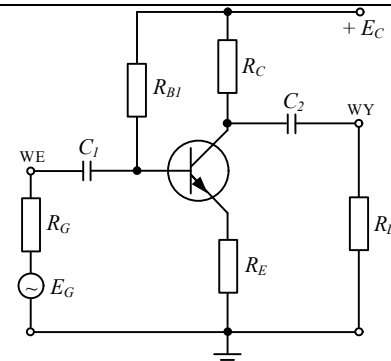
Task 1

For the circuit in the figure, sketch the frequency characteristics (amplitude and phase) for a logarithmic frequency scale. Plot the amplitude characteristics in dB, and the phase characteristics in degrees. Estimate the 3 dB value of the system's cutoff frequency. For calculations, assume: $R_1 = R_2 = 2k\Omega$, $C = 1nF$.



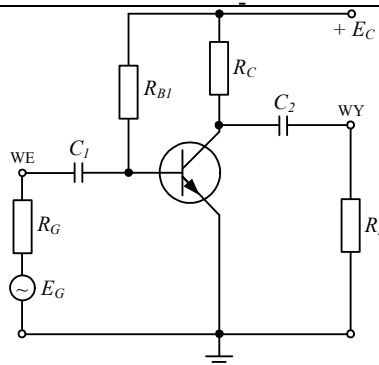
Task 2

Estimate the operating point of the transistor (I_{CQ} , U_{CEQ}) in Fig. For calculations, assume: $R_C = 3k\Omega$, $R_{B1} = 560k\Omega$, $R_E = 100\Omega$, Early voltage $U_A = 100V$, $E_C = +15V$, $\beta = 100$, $U_{BE} = 0.65V$.



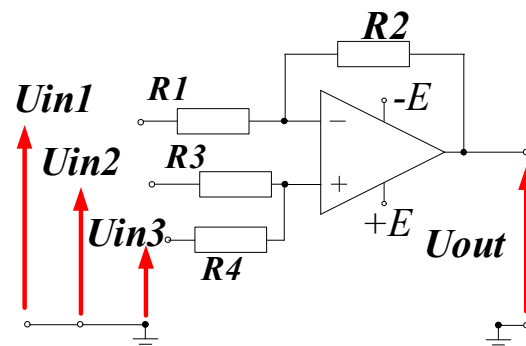
Task 3

Estimate the effective voltage gain of the amplifier circuit. For the calculation, assume: $R_{B1} = 910k\Omega$, $R_C = 6.8k\Omega$, $R_G = 5.1k\Omega$, $R_L = 10k\Omega$, $\beta = 100$, $E_C = 12V$ transistor operating point $I_{CQ} = 1.2mA$, $U_{CEQ} = 4.3V$, Early voltage $U_A = 100V$, $\phi_{(T)} = 25mV$



Task 4

In the amplifier circuit from fig. assuming ideal OA parameters and $U_{IN1} = 2V$, $U_{IN2} = 2V$, $U_{IN3} = 2V$, $R_1 = 10k\Omega$, $R_3 = 20k\Omega$, $R_2 = 40k\Omega$, $R_4 = 10k\Omega$, estimate the value of the output voltage U_{OUT} ;



Task 5

In the circuit in the figure, $R_S = 810\Omega$, $E = 22V$, $I_{RL} = 5mA$ and a Zener diode with a voltage: $V_Z = 8V$, $I_{Zmin} = 3mA$

- Estimate the diode current assuming the dynamic resistance of the diode $R_Z = 0\Omega$
- How will the output voltage in the stabilizer change when varying the load current (I_L) from 6 to 10mA and assuming $R_Z = 25\Omega$?

