4.5)

a) $BW = 426.7\text{ Hz}$

b) One possible design: $R_1 = 373\text{ k}$, $R_2 = R_4 = 49.74\text{ k}$, $R_3 = 23.54\text{ k}$, $R_5 = 10\text{ k}$, $C_1 = C_2 = 1\text{ nF}$.

LTSpice simulation results are shown below. The 741 response is shown in blue. The ideal op amp response is in green and the theoretical response is in red. The theoretical response and the ideal op amp simulation results overlap. The 741 simulation results differ slightly. The 741 peak is slightly higher and lies slightly to the left of the desired theoretical response.

4.25)

a) $R_1 = 3.516\text{ k}$, $R_2 = R_4 = 4.974\text{ k}$, $R_3 = 3.138\text{ k}$, $R_5 = 10\text{ k}$, $C_1 = C_2 = 10\text{ nF}$.

LTSpice simulation below. Simulated 741 and ideal responses and the theoretical response overlap.
4.26) a) Sallen-Key: $C = 10 \text{ nF}, R = 4.974k, RA = 10k, RB = 5.856k$

Since $H_o = K$, no gain adjustment is necessary.

The simulated ideal and 741 responses and the theoretical response are shown below. The theoretical response overlaps the simulated ideal. The 741 response deviates from the other two responses at higher frequencies.

4.28) a) Sallen-Key High Pass: $C = 10 \text{ nF}, R = 4.974k, RA = 10k, RB = 5.856k$

The simulated ideal and 741 responses and the theoretical response are shown below. They overlap.
4.29)

a) SAB with Q enhancement: \( C = 10 \, \text{nF}, R1/a = 1.891k, R1/(1-a) = 3.131k, R2 = 10.61k \)
\( KR = 10k, (1 – K)R = 54.02k \)

The simulated ideal and 741 responses and the theoretical response are shown below. The 741 peak is just slightly higher and slightly to the left of the simulated ideal and theoretical responses.