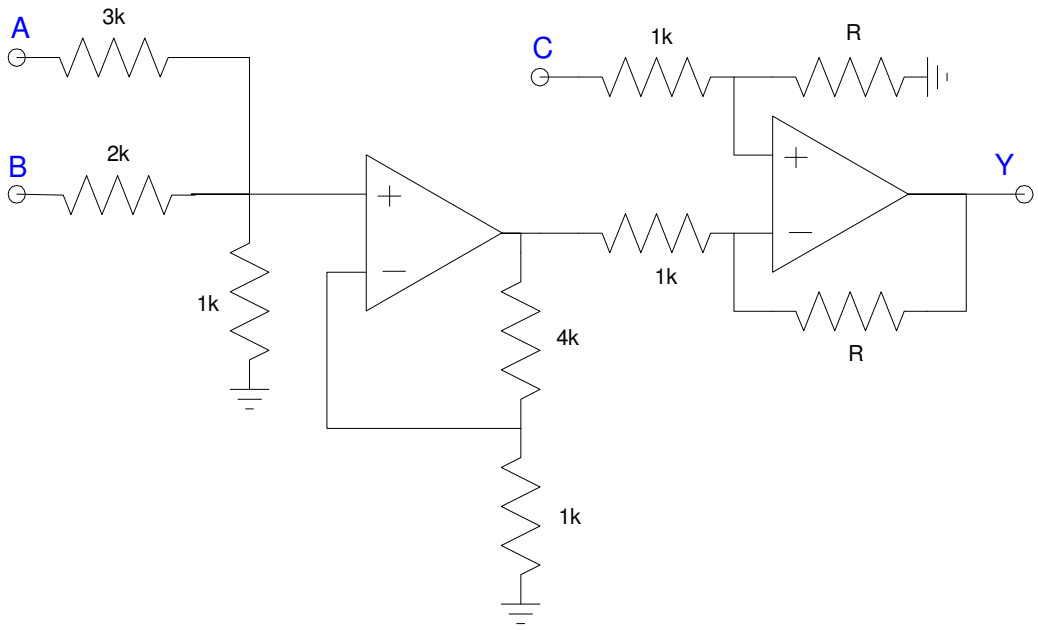
ECE 321 - Final Exam - Name _____

Fall 2021

1. OpAmp Circuits: Determine y as a function of A, B, and C. Assume

- Ideal op-amps
- R 1100 + 100*(your birth month) + (your birth day). May 14th would give R = 1614 Ohms

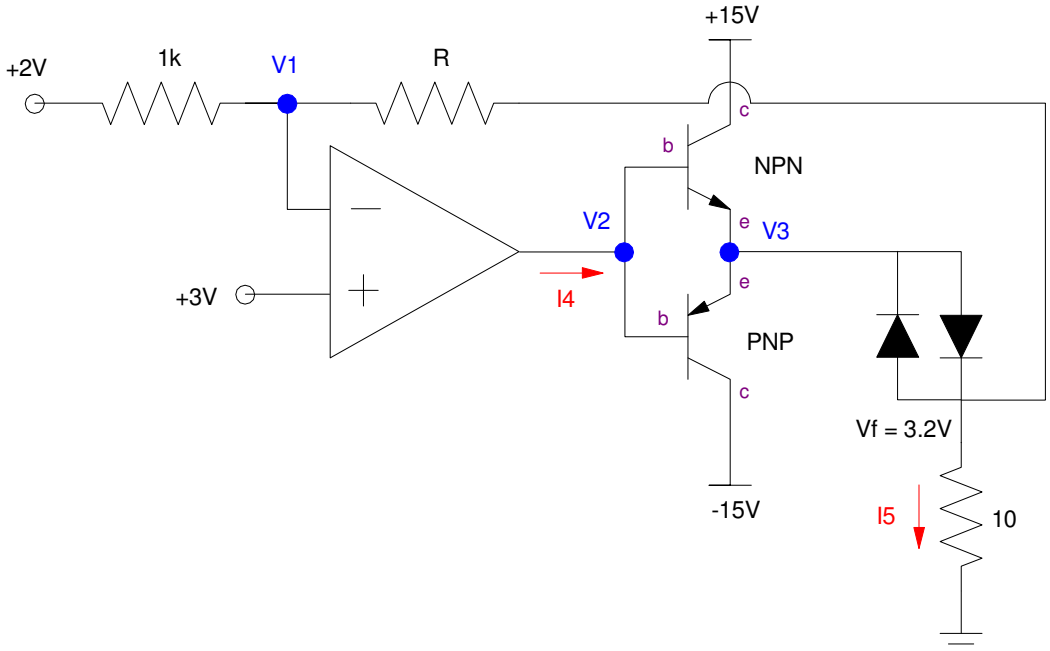
R 1100 + 100*mo + day	Y = aA + bB + cC



2. Push-Pull: Determine the voltages and currents for the following push-pull amplifier. Assume

- R = 1100 + 100*(birth month) + (birth day). May 14th gives R = 1614 Ohms
- | Vce | = 0.7V (ideal silicon diodes)
- $\beta = 30$

R 1100 + 100*mo + day	V1	V2	V3	I4	I5



3. Instrumentation Amplifier: Assume a thermistor has the temperature - resistance relationship of

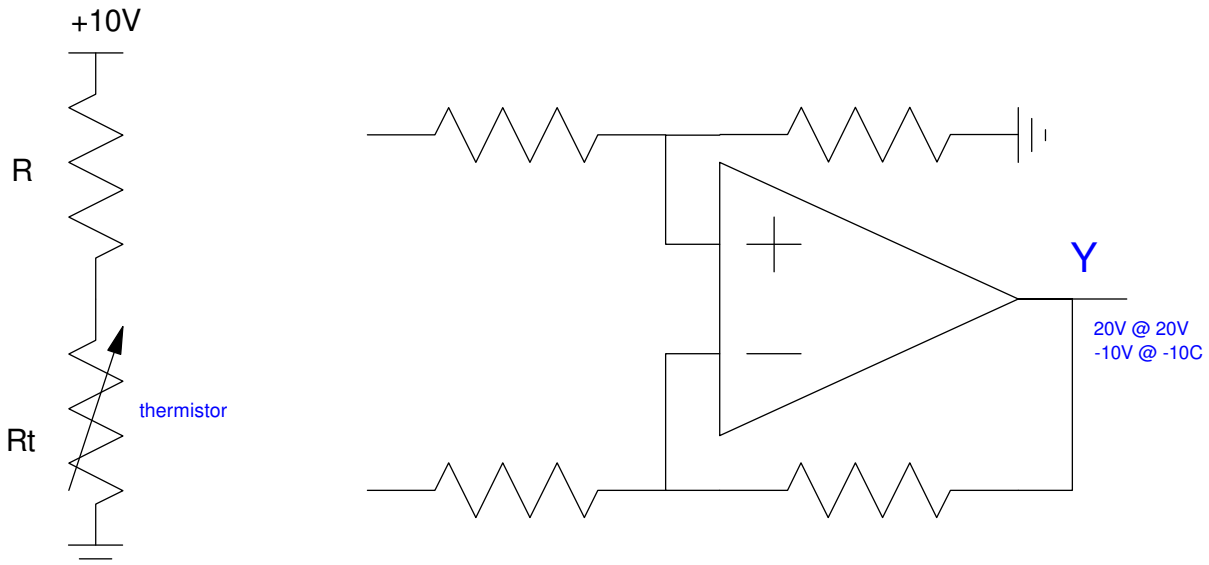
$$R_t = 3000 \cdot \exp\left(\frac{4000}{T+273} - \frac{4000}{298}\right)\Omega$$

Design a circuit which outputs

- +20V at +20C, and
- -10V at -10C

Assume

- R = 1100 + 100*(your birth month) + (your birth date)

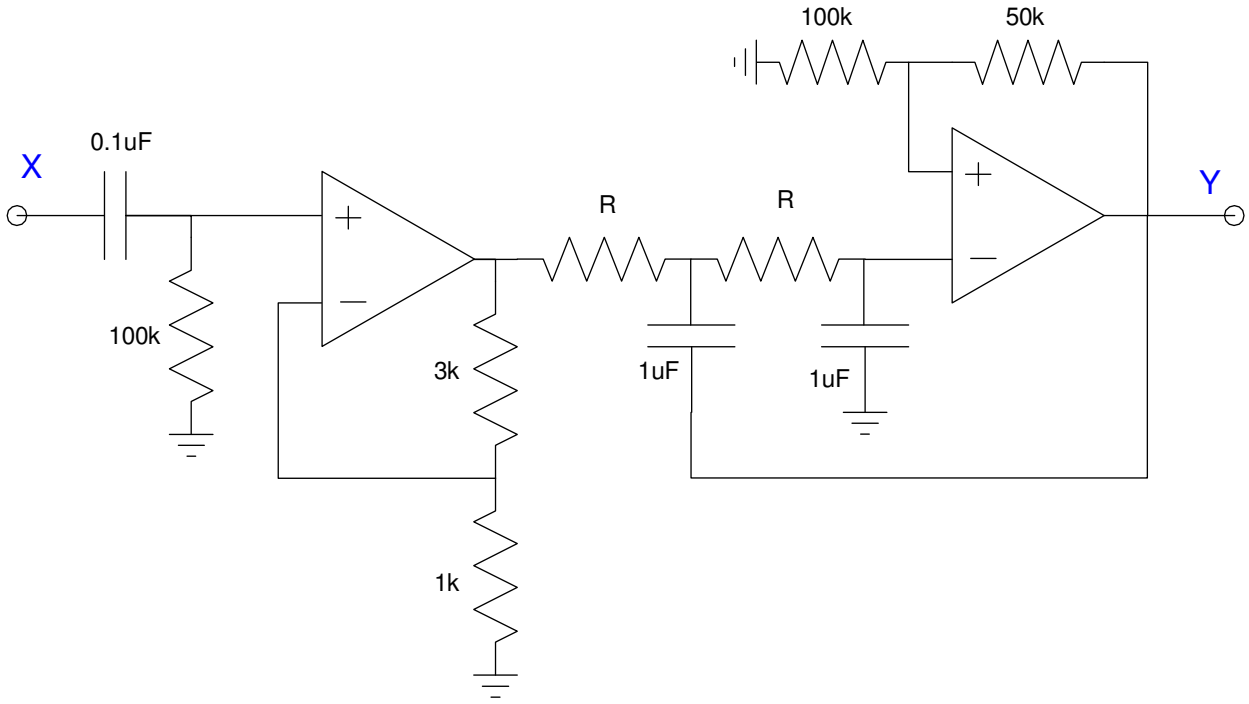


4. Filters: Let

- R 1100 + 100*(your birth month) + (your birth day). May 14th would give R = 1614 Ohms

Find the transfer function from X to Y

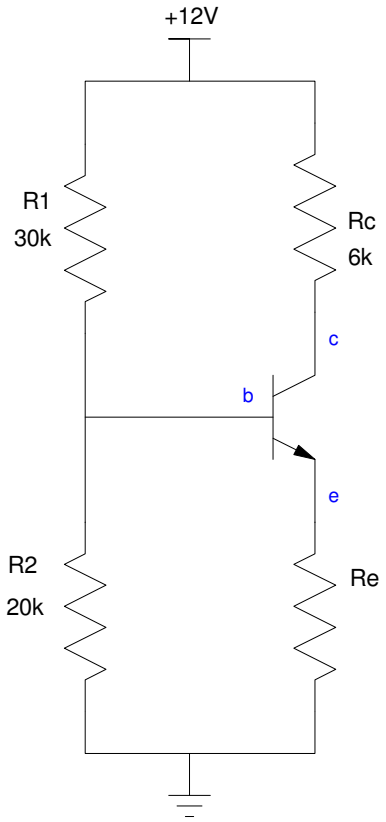
R 1100 + 100*mo + day	Transfer Function Y = G(s) * X

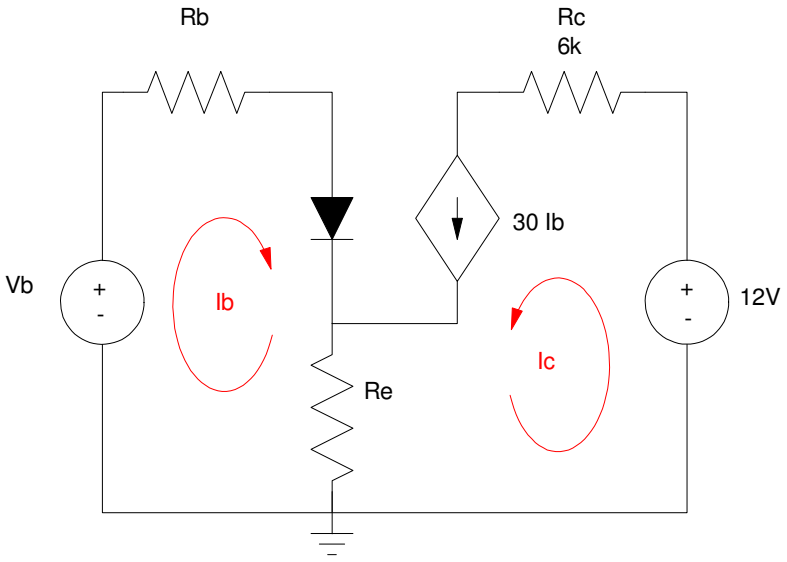


5. CE Amplifiers (DC analysis): Determine the Thevenin equivalent of R1 and R2 as well as the operating point for the following transistor circuit. Assume

- R = 1100 + 100*(your birth month) + (your birth date)
- $\beta = 30$
- $|V_{ce}| = 0.7V$

R 1100 + 100*mo + day	Vb	Rb	Vce	Ic

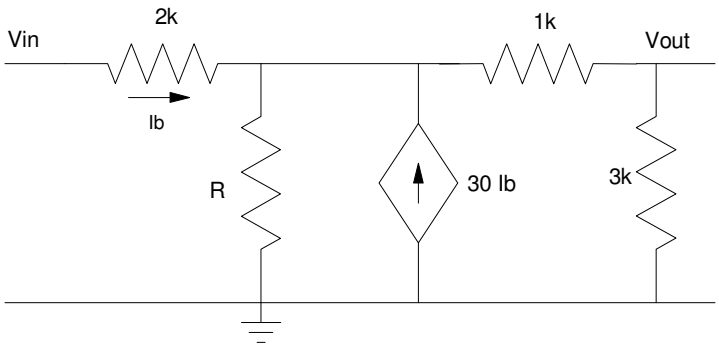


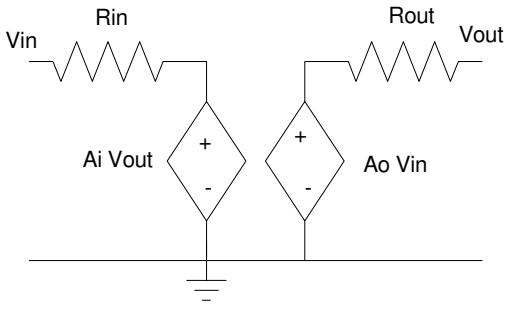


6. 2-Port model: Determine the 2-port parameters for the following circuit. Assume

- R = 1100 + 100*(your birth month) + (your birth date) Ohms

R 1100 + 100*mo + day	Rin	Ai	Rout	Ao





7. 2-Port model: Determine the 2-port parameters for the following circuit. Assume

R = 1100 + 100*(your birth month) + (your birth date) Ohms

R 1100 + 100*mo + day	Rin	Ai	Rout	Ao