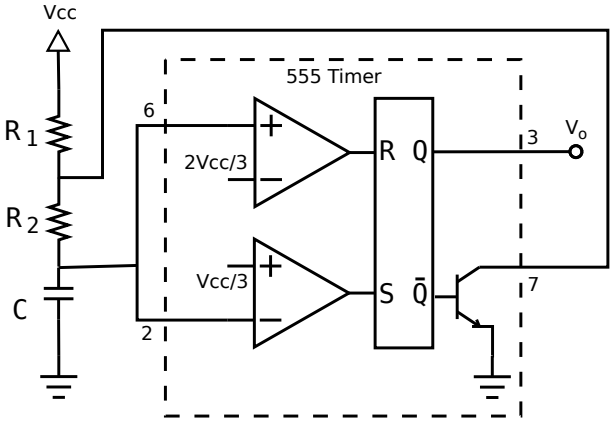
(1/5) Name _____ Student Number _____

(4/5) Please answer the following question in the space below:

For the electronic diagram shown, $\mathrm{V_{CC}} = 6\,\mathrm{V}$,

- $\mathrm{R_1} = \mathrm{R_2} = 10\,\mathrm{k\Omega}$, and $\mathrm{C_1} = 10\,\mathrm{nF}$. Sketch the waveforms at R, S, Q, $\bar{\mathrm{Q}}$, and pin #2.

Label voltages and transition times. Show the first two periods of the oscillation. At $t = 0$, the capacitor has zero charge.

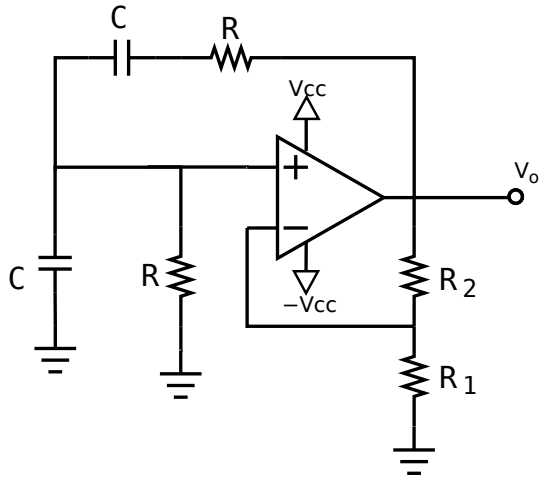


(1/5) Name _____ Student Number _____

(4/5) Please answer the following question in the space below:

For the electronic diagram shown, the op amp is ideal, with $\mathrm{V_{CC}} = 5\,\mathrm{V}$. Is is desired to have an oscillation freqency of 10 kHz.

- If $\mathrm{C_1} = 10\,\mathrm{nF}$, what value of R is required?
- If $\mathrm{R_1} = 10\,\mathrm{k\Omega}$, what value of $\mathrm{R_2}$ is required?

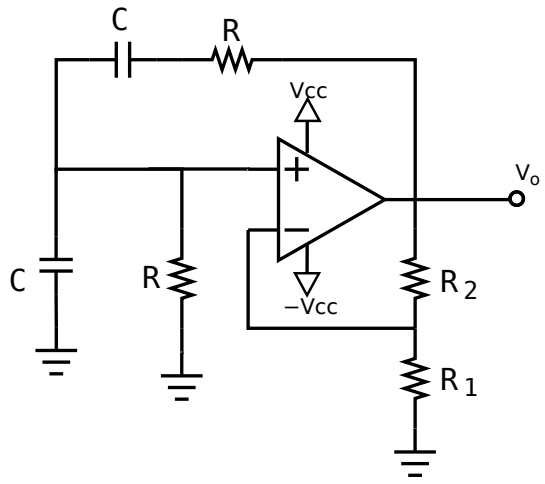


(1/5) Name _____ Student Number _____

(4/5) Please answer the following question in the space below:

For the electronic diagram shown, the op amp is ideal, with $\mathrm{V_{CC}} = 5\,\mathrm{V}$. $\mathrm{C_1} = 10\,\mathrm{nF}$, $\mathrm{R} = 10\,\mathrm{k\Omega}$, $\mathrm{R_1} = 1\,\mathrm{k\Omega}$, and $\mathrm{R_2} = 10\,\mathrm{k\Omega}$, and

- What is the frequency of the waveform at $\mathrm{V_o}$?
- Sketch the shape of $\mathrm{V_o}$, show the maximum and minimum values.
- Explain why $\mathrm{V_o}$ is not a sinusoidal shape.



(1/5) Name _____ Student Number _____

(4/5) Please answer the following question in the space below:

The circuits below look similar, but give very different outputs (V_i is the input from another circuit).

- Briefly explain what each circuit does.
- Explain how they are different, and why.