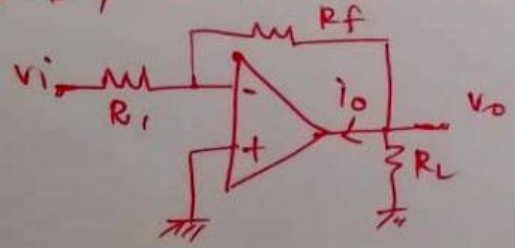
19. For the non-inverting amplifier R_1 = 1kΩ, R_f = 100kΩ
a) Calculate the maximum output offset voltage due to V_{IOS} and I_B. Assume V_{IOS} = 10 mV, I_B = 300 nA, I_{OS} = 50 nA
b) Calculate R_{comp} needed to reduce the offset of I_B
c) Calculate the maximum output offset voltage if R_{comp} as calculated in (b) is connected in the circuit.

20. A non-inverting amplifier with a gain of 100 is nulled at 20°C. What will happen to the output voltage if the temperature rises to 50°C for an offset voltage drift of 0.15 mV/°C?

21. For the below circuit, R_1 = 1kΩ, R_f = 100kΩ, R_L = 50kΩ, calculate the total current i_o.



22. Derive the output resistance of practical inverting amplifier.

23. Explain slew rate and derive it. Derive an equation of fm maximum input frequency at which we can obtain an undistorted output voltage.

24. Derive the DC characteristics of operational amplifier.