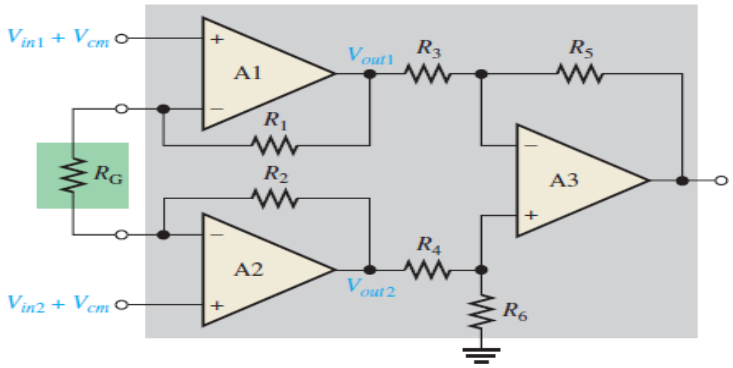
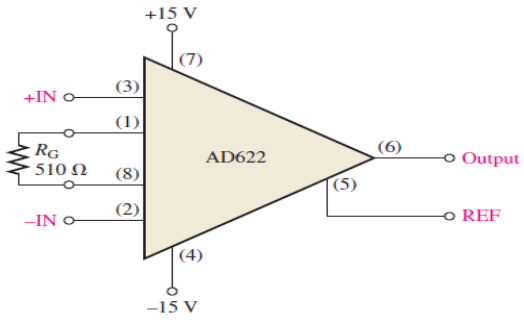
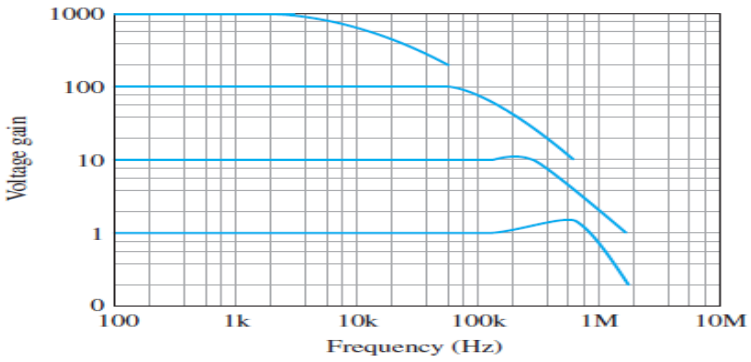
Faculty of engineering at shoubra **Communication department** **ECE-322: Electronic Circuits (B)**		**Dr. Ahmad El-Banna** **Semester : Spring 2017** **Sheet :4** **Special-purpose Op-amp Circuits**

1. Determine the value of the external gain-setting resistor R_G for a certain IC instrumentation amplifier with $R_1 = R_2 = 25K\Omega$.The closed-loop voltage gain is to be 500.

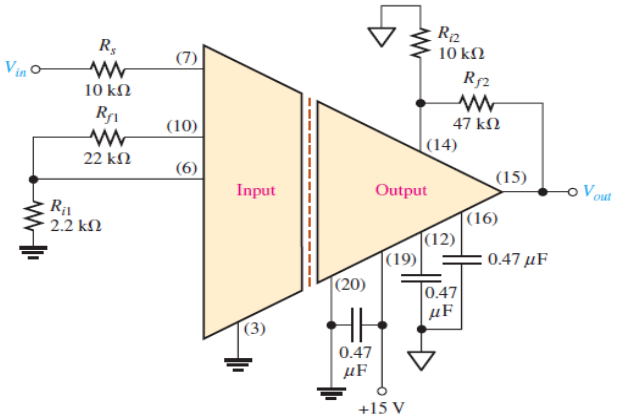


2. Calculate the voltage gain and determine the bandwidth using the graph in Figure. Modify the circuit for a gain of approximately 45.

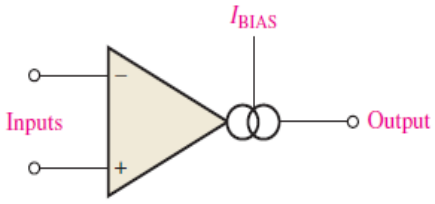




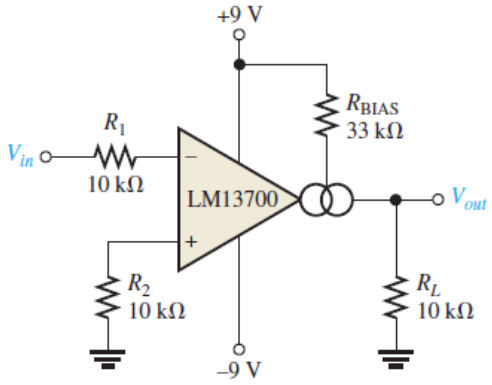
3. Determine the total voltage gain of the 3656KG isolation amplifier in Figure



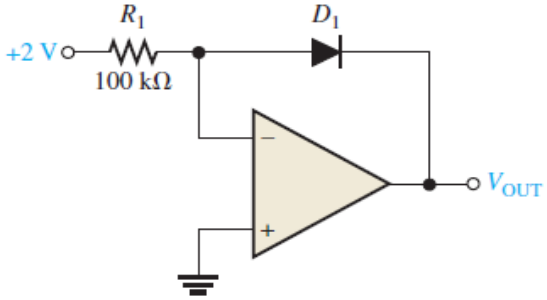
4. If an OTA has a g_m = 1000 mS what is the output current when the input voltage is 25 mV?
Based on K ≈16 mS/mA calculate the approximate bias current required to produce g_m = 1000 mS.



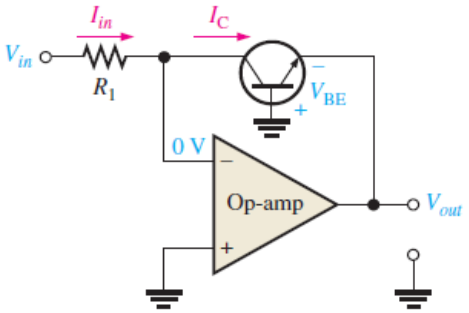
5. The OTA in Figure is connected as an inverting fixed-gain amplifier where $+V_{BIAS}$ = +V. Determine the approximate voltage gain. K ≈ 16 mS/mA



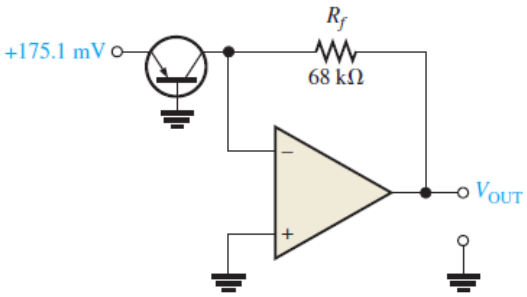
6. Determine the output voltage for the log amplifier in Figure. Assume I_R = 50 nA.



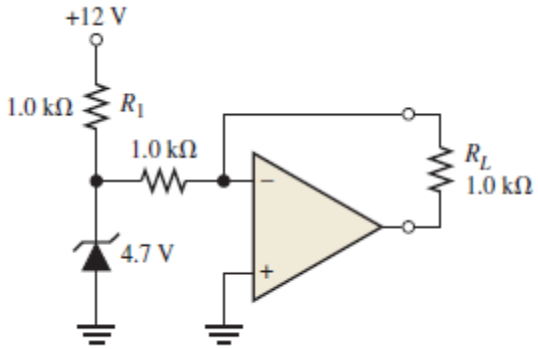
7. What is V_{out} for a transistor log amplifier with V_{in} = 3 V and R_1 = 68 kΩ? Assume I_{EBO} = 40 nA.



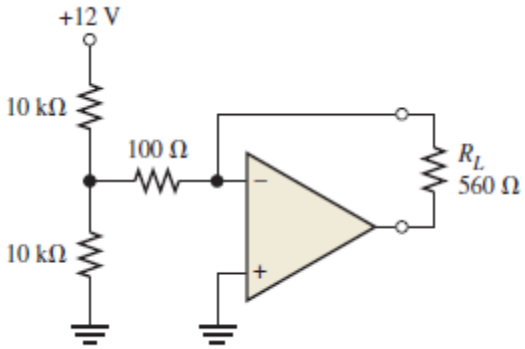
8. For the antilog amplifier in Figure, find the output voltage. Assume $I_{EBO} = 40$ nA.



9. Determine the load current in each circuit of Figure



(a)



(b)