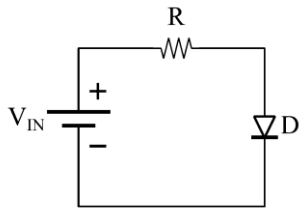
ED/FEC

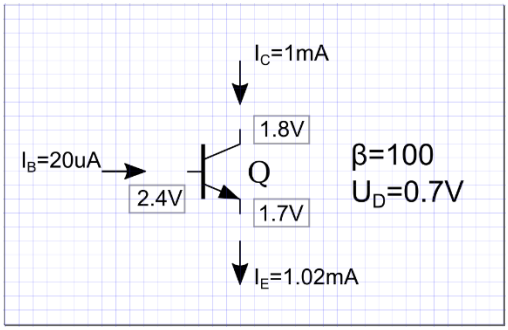
Test model – 2025-2026

1. Considering the model with ideal diode and $U_D = 0.6V$ cut-in voltage, $V_{IN} = 2.6V$ as well as a $R = 2k\Omega$, the current through the diode will be:



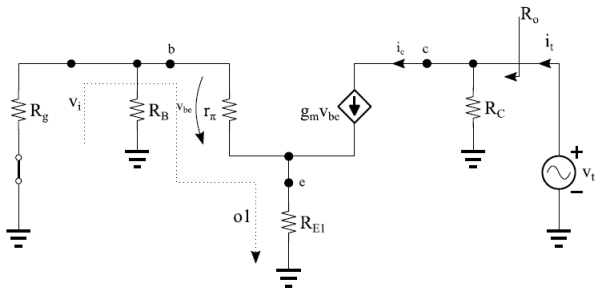
a. 0mA
b. 1mA
c. 2mA
d. 2.6mA

2. What is the operating region for the bipolar transistor?



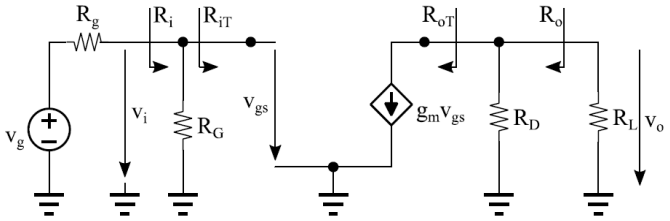
a. FAR
b. CR
c. SR
d. RAR

3. What is the expression for the output resistance, R_o?



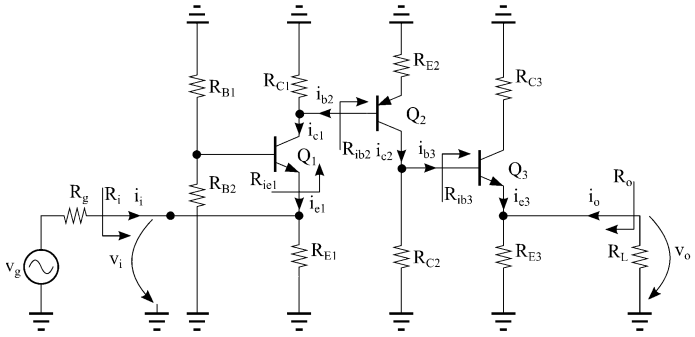
a. $\boldsymbol{R_C}$
b. $R_C||R_{E1}$
c. ∞
d. 0

4. What is the relation between v_o and v_{gs} in this circuit?



a. $\boldsymbol{v_o = -g_m v_{gs}(R_D||R_L)}$
b. $v_o = g_m v_{gs}(R_D||R_L)$
c. $v_o = -g_m v_{gs}\frac{R_D}{R_D+R_L}$
d. $v_o = -g_m v_{gs}\frac{R_L}{R_D+R_L}$

5. How does i_{b3} depend on i_{c2}?



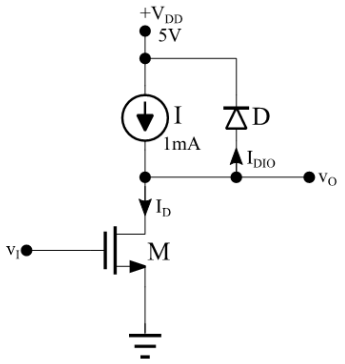
a. $\boldsymbol{i_{b3} = \frac{R_{C2}}{R_{C2}+R_{ib3}} i_{c2}}$

b. $i_{b3} = -\frac{R_{C2}}{R_{C2}+R_{ib3}} i_{c2}$

c. $i_{b3} = \frac{R_{ib3}}{R_{C2}+R_{ib3}} i_{c2}$

d. $i_{b3} = -\frac{R_{ib3}}{R_{C2}+R_{ib3}} i_{c2}$

6. The condition for the n-channel MOS transistor in the image to operate in triode is:



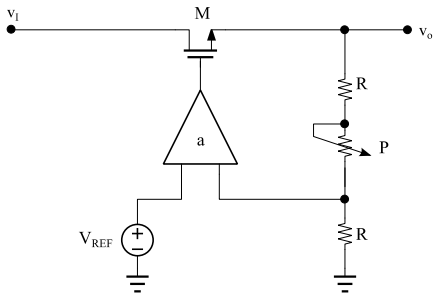
a. $v_{GS} \leq V_{TH}$

b. $v_{GS} > V_{TH}$ and $v_{DS} \leq v_{GS} - V_{TH}$

c. $v_{GS} \leq V_{TH}$ and $v_{DS} > v_{GS} - V_{TH}$

d. $v_{GS} > V_{TH}$ and $v_{DS} > v_{GS} - V_{TH}$

6. For the voltage regulator in the image, how should the error amplifier inputs be defined so that the loop is negative feedback?



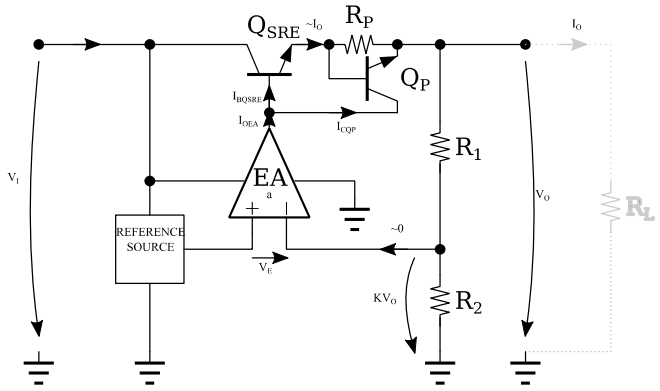
a. (+) left, (-) right

b. (-) left, (+) right

c. (+) left, (+) right

d. (-) left, (-) right

7. For the regulator in the image, the limiting mechanism does not allow the output current to exceed the value:



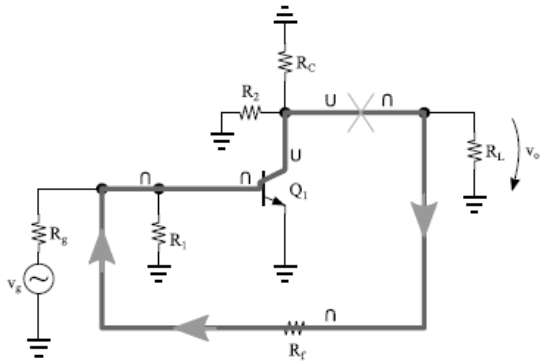
a. $\boldsymbol{I_O \approx \frac{U_D}{R_P}}$

b. $I_O \approx \frac{V_T}{R_P}$

c. $I_O \approx \beta_{Q_{SRE}} \cdot I_{OUT_{MAX_{EA}}}$

d. $I_O \approx \frac{V_{REF}}{R_2}$

8. What is the feedback topology for this amplifier??



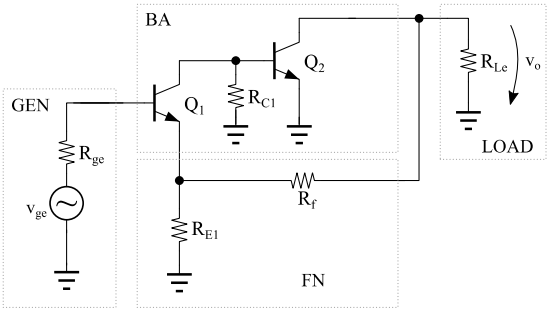
a. S-S

b. S-P

c. P-S

d. P-P

9. The amplification regulated by the negative feedback, approximate value, for the structure in the image is:



a. $\boldsymbol{A_v \approx 1 + \frac{R_f}{R_{E1}}}$

b. $A_y \approx \frac{1}{R_f}$

c. $A_i \approx \frac{R_f}{R_{E1}}$

d. $A_z \approx -R_f$