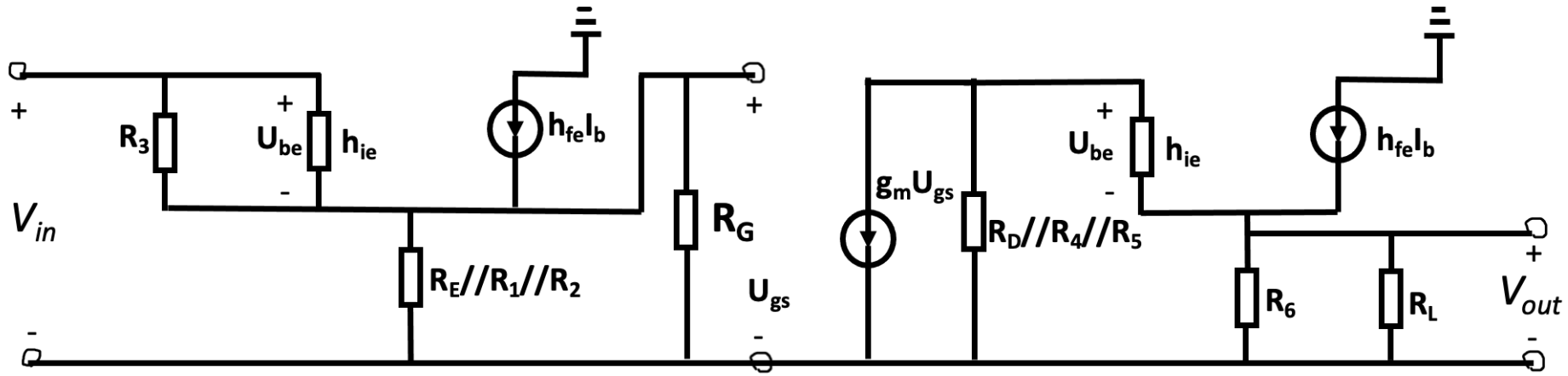




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Calculate the output voltage  $V_{out}$  if  $V_{in} = \sin(10^3 t)$ .

Given:

$$R_1 = 10 \text{ k}\Omega, R_2 = 10 \text{ k}\Omega, R_3 = 10 \text{ k}\Omega, R_4 = 20 \text{ k}\Omega, R_5 = 68 \text{ k}\Omega, R_6 = 330 \text{ }\Omega$$

$$R_E = 1 \text{ k}\Omega, R_G = 1 \text{ M}\Omega, R_L = 50 \text{ }\Omega, R_D = 1.2 \text{ k}\Omega, R_S = 131.5 \text{ }\Omega$$

$$E = 12 \text{ V}$$

$$V_p = -3.5 \text{ V}$$

$$g_m = 3 \text{ mS}$$

$$h_{ie} = 2 \text{ k}\Omega$$

$$h_{fe} = 100$$

$$B = 100$$

$$I_{CQ} = 4.6 \text{ mA}$$

$$U_{CE} = 7.3 \text{ V}$$

$$I_{DQ} = 6 \text{ mA}$$

$$U_{DSQ} = 4 \text{ V}$$



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