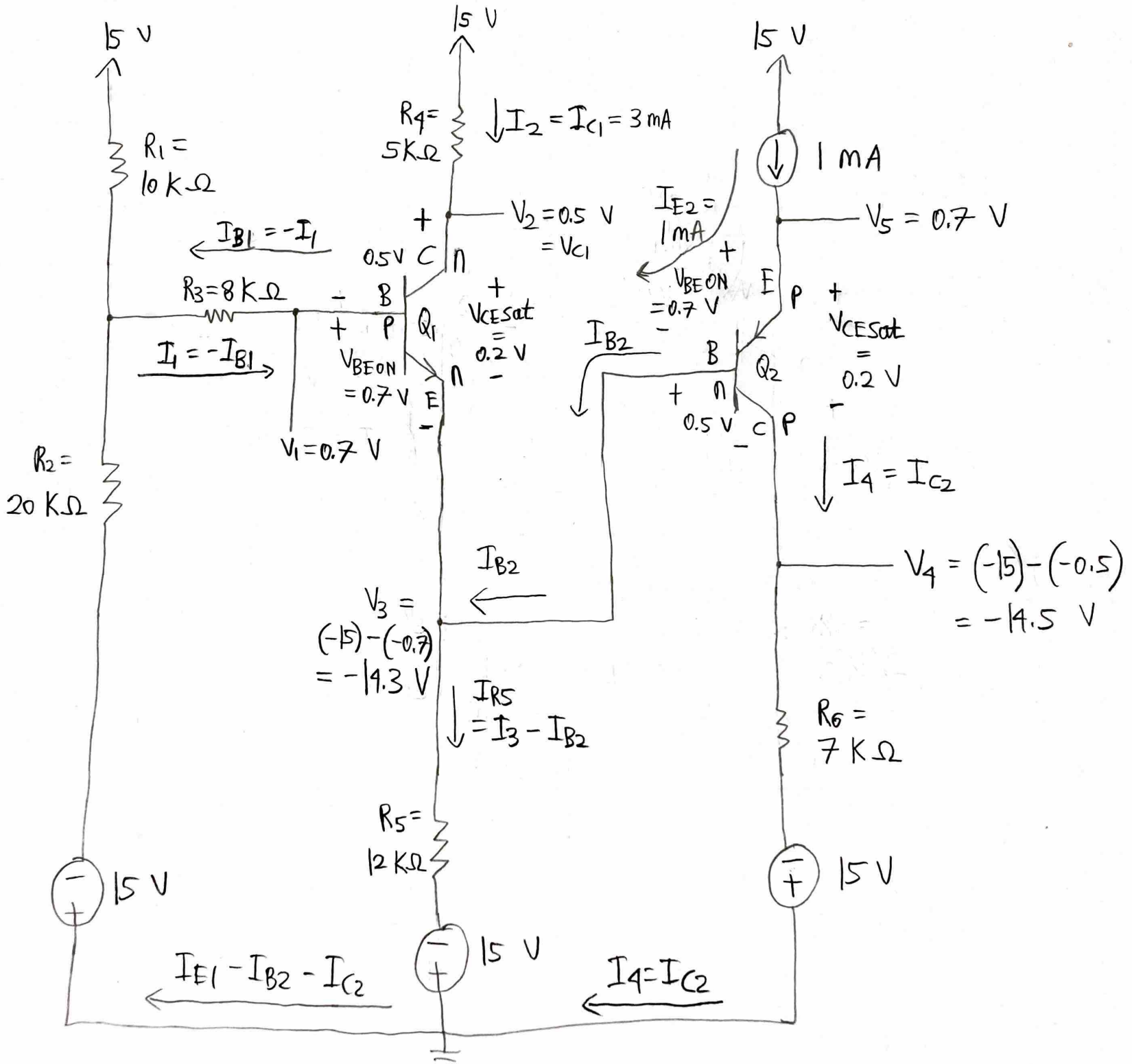
15 V
15 V
15 V
R1 = 10 KΩ
R2 = 20 KΩ
R3 = 8 KΩ
R4 = 5 KΩ
R5 = 12 KΩ
R6 = 7 KΩ
I2 = IC1 = 3 mA
1 mA
IB1 = -I1
I1 = -IB1
V2 = 0.5 V = VC1
V5 = 0.7 V
IE2 = 1 mA
VBEON = 0.7 V
VCEsat = 0.2 V
0.5 V
V1 = 0.7 V
IB2
I4 = IC2
V4 = (-15) - (-0.5) = -14.5 V
V3 = (-15) - (-0.7) = -14.3 V
IR5 = I3 - IB2
Q1
Q2
B
C
E
n
p
15 V
15 V
15 V
IE1 - IB2 - IC2
I4 = IC2

$$I_1 = -I_{B1}$$

$$= -\frac{I_{C1}}{\beta}$$

$$= -\frac{3 \cdot 10^{-3}}{100}$$

$$= -3 \cdot 10^{-5} \text{ A}$$

$$I_3 = I_{E1}$$

$$= \frac{\beta+1}{\beta} I_{C1}$$

$$= \frac{101}{100} \cdot 3 \cdot 10^{-3}$$

$$= 3.03 \cdot 10^{-3} \text{ A}$$

$$I_2 = I_{C1}$$

$$= \frac{15}{5000}$$

$$= 3 \cdot 10^{-3} \text{ A}$$

Formula:

$$I_C = \beta I_B$$

$$I_C = \frac{\beta}{\beta+1} I_E$$

$$I_E = (\beta+1) I_B$$

$$I_4 = I_{C2}$$

$$= \frac{\beta}{\beta+1} I_{E2} = \frac{100}{101} \cdot 10^{-3}$$

$$= 0.99 \cdot 10^{-3} \text{ A}$$