Homework for Analogue Electronics

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图 6 电路中，已知 $I_C = 2.5\ \text{mA}$，$R_C = 5\ \text{k}\Omega$，$R_L = 10\ \text{k}\Omega$，求电流 I 。

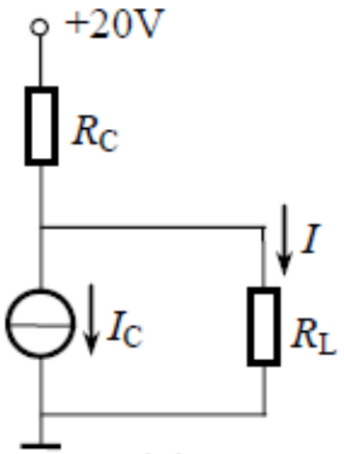
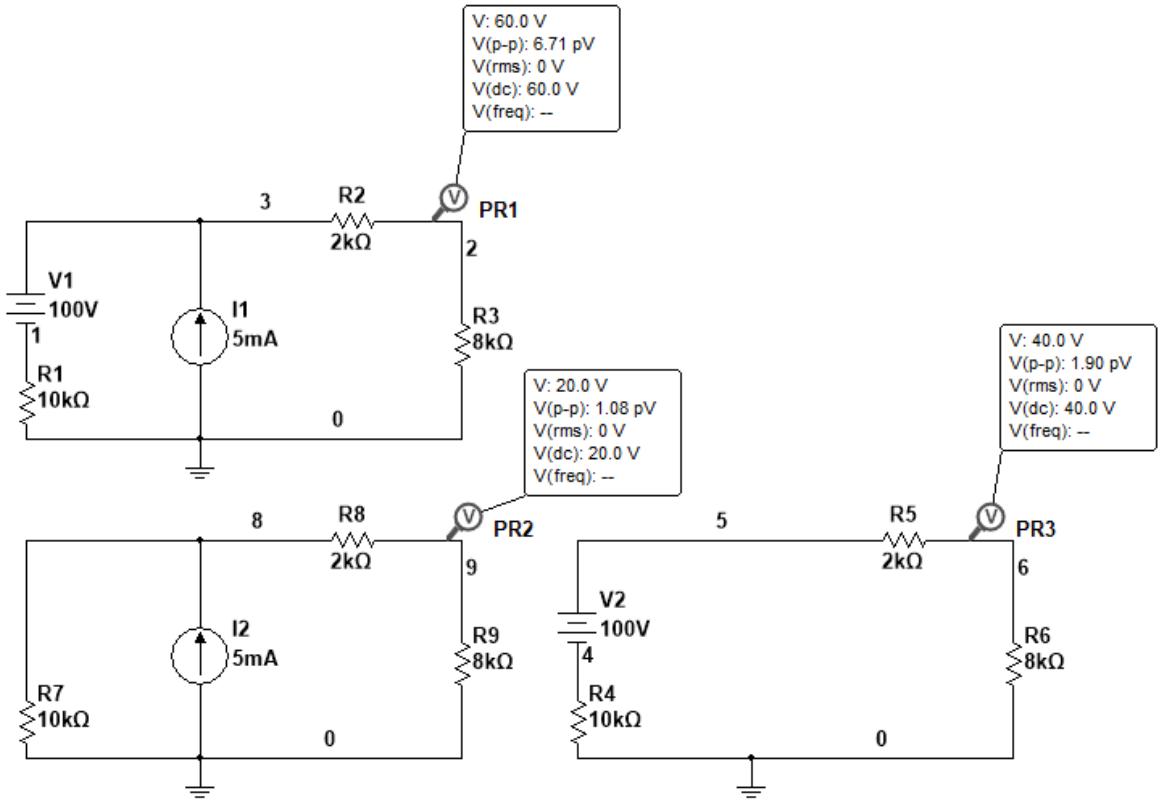


图 6

Solution We separate the whole circuit into these two sub-circuits, as the picture below shows.



For the circuit on the bottom left position, we write

$$I = 5\ \text{mA} \times \frac{10\ \text{k}\Omega}{2\ \text{k}\Omega + 8\ \text{k}\Omega + 10\ \text{k}\Omega} = 2.5\ \text{mA}$$

$$U = IR = 2.5\ \text{mA} \times 8\ \text{k}\Omega = 20\ \text{V}$$

For the circuit on the bottom right

$$I = \frac{100\ \text{V}}{10\ \text{k}\Omega + 2\ \text{k}\Omega + 8\ \text{k}\Omega} = 5\ \text{mA}$$

$$U = 5\ \text{mA} \times 8\ \text{k}\Omega = 40\ \text{V}$$

So, as for the original circuit

$$U_b = 20\ \text{V} + 40\ \text{V} = 60\ \text{V}$$