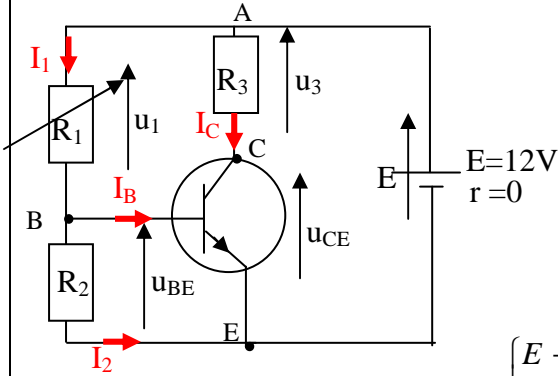


حل التمرين 04

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.1

1.1. تحديد قيمة R_2

$$u_{BE} = R_2 I_2 \Rightarrow I_2 = \frac{u_{BE}}{R_2} \Rightarrow I_2 = \frac{0,8}{500} = 1,6mA$$

حساب شدة تيار القاعدة I_B

$$\begin{cases} E - R_3 I_C - u_{CE} = 0 & (1) \\ E - R_1 I_1 - u_{BE} = 0 & (2) \\ I_1 = I_2 + I_B & (3) \end{cases}$$

$$(1) \Rightarrow I_C = \frac{E - u_{CE}}{R_3} \Rightarrow \beta I_B = \frac{E - u_{CE}}{R_3} \Rightarrow I_B = \frac{1}{\beta} \left(\frac{E - u_{CE}}{R_3} \right)$$

$$I_B = \frac{1}{200} \left(\frac{12 - 7}{10^3} \right) = 2,5 \cdot 10^{-5} A = 25 \mu A$$

1.2. تحديد قيمة R_1

$$(2) \Rightarrow R_1 = \frac{E - u_{BE}}{I_1}$$

$$(3) \Rightarrow R_1 = \frac{E - u_{BE}}{I_2 + I_B} \Rightarrow R_1 = \frac{12 - 0,8}{1,6 \cdot 10^{-3} + 25 \cdot 10^{-6}}$$

$$\Rightarrow R_1 = 6892 \Omega$$

.2

.2.1

$$(1) \Rightarrow E - R_3 I_S - u_{CE} = 0$$

$$u_{CE} = 0 \Rightarrow I_S = \frac{E}{R_3} \Rightarrow I_S = \frac{12}{10^3} = 12mA$$

$$I_{B \max} = \frac{I_S}{\beta} \Rightarrow I_{B \max} = \frac{12 \cdot 10^{-3}}{200} = 600 \mu A \quad .2.2$$

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