

BJT

Q.1: In CB configuration $I_C = 0.96 \text{ mA}$ and $I_B = 40 \text{ nA}$ determine α and I_E .

$$[\alpha = 0.96, I_E = 1 \text{ mA}]$$

Q.2: If the emitter current of a transistor is 8 mA and I_B is $1/100$ of I_C , determine I_C and I_B .

Q.3: An npn transistor has $\beta = 100$ and base to collector leakage current = 4 nA . Calculate I_C if $I_B = 40 \text{ nA}$.

$$[I_C = 4.404 \text{ mA}]$$

Q.4: If base current is 30 nA and the emitter current is 7.2 mA what are the values of α and β ?

$$[\beta = 239, \alpha = 0.9958]$$

Q.5: In an npn transistor $\alpha = 0.98$, $I_E = 10 \text{ mA}$ and leakage current is $I_{CBO} = 1 \text{ nA}$. Determine I_C , I_B and I_{CEO} .

$$[I_C = 9.801 \text{ mA}, I_B = 0.199 \text{ mA}, I_{CEO} = 50 \text{ nA}]$$

Q.6: Find the value of base current if common base DC current gain of BJT is 0.987 and $I_E = 10 \text{ mA}$.

$$[I_B = 0.13 \text{ mA}]$$

Q.7: The collector and base current of npn transistor are 5 mA and 50 nA respectively. If $I_{CBO} = 1 \text{ nA}$

(i) find α , β , I_E $\longrightarrow [0.99, 100, 5.05 \text{ mA}]$

(ii) determine the new level of I_B required to produce $I_C = 10 \text{ mA}$.

$$[I_B = 98.99 \text{ nA}]$$

Q.8: The value of β for BJT is 100 . If $I_E = 10 \text{ mA}$ then determine the values of I_C and I_B .

$$[I_C = 9.9 \text{ mA}, I_B = 0.099 \text{ mA}]$$

Q.9: Given that $\alpha_{DC} = 0.987$, determine the value of β_{DC} .

$$[\beta_{DC} = 75.92]$$

Q.10: Given $\beta_{DC} = 120$. find the corresponding value of α_{DC} .

$$[\alpha_{DC} = 0.9917]$$