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Electronic Circuits II - Tutorial 06

BJT Amplifiers 1

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Problems

Q1	What is the lowest value of dc collector current to which a transistor having the characteristic curves in Figure can be biased and still retain linear operation with a peak-to-peak base current swing of 20 μA?
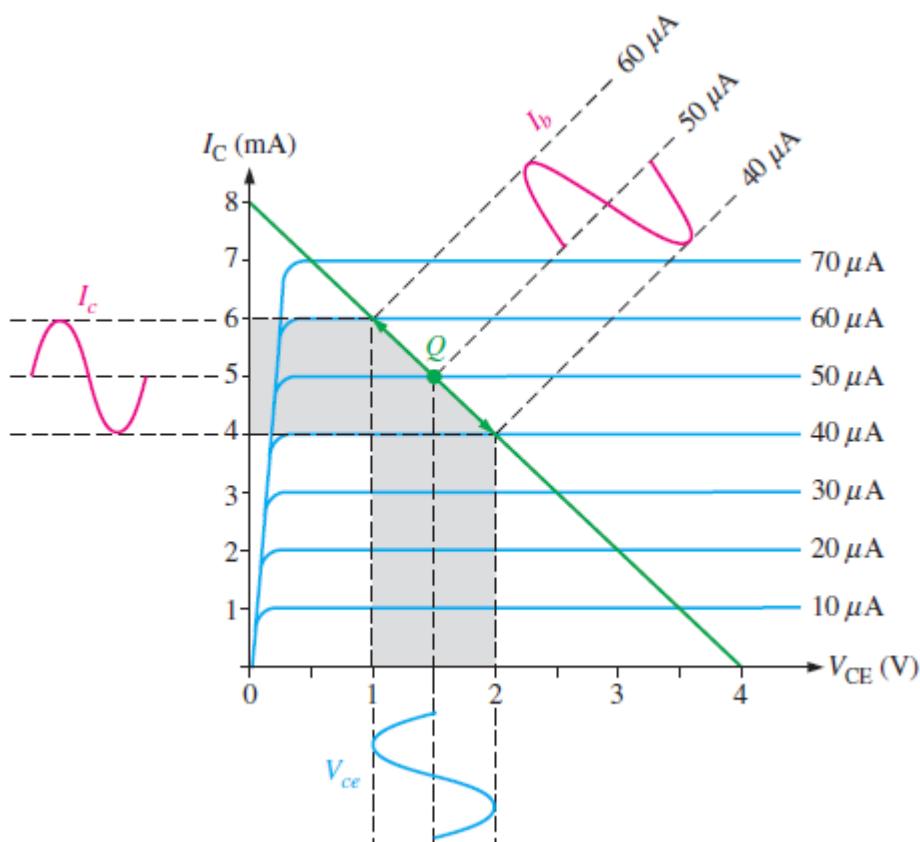
Sol 1	Less than 2 mA and greater than 1 mA

Q2	What is the highest value of I_C under the conditions described in Problem 1?
Sol 2	Less than 7 mA and greater than 6 mA

Q3	If the dc emitter current in a transistor is 3 mA, what is the value of r'_e?
Sol 3	... 8.33 Ω

Q4	If the h_{fe} of a transistor is specified as 200, determine β_{ac}.
Sol 4	200

Q5	A certain transistor has a dc beta (h_{FE}) of 130. If the dc base current is $10\,\mu$A, determine r'_e. $\alpha_{DC} = 0.99$.
Sol 5	19.43 ohm

Q6	At the dc bias point of a certain transistor circuit, $I_B = 15\,\mu A$ and $I_C = 2\,mA$. Also, a variation in I_B of $3\,\mu A$ about the Q-point produces a variation in I_C of $0.35\,mA$ about the Q-point. Determine β_{DC} and β_{ac}.
Sol 6	DC = 133.33 AC=116.67