19EEE114 Electronic Circuits

Assignment #3

Due Date: 18th April 2022

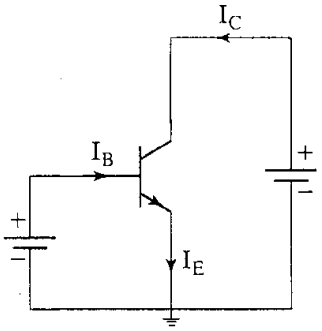
Q1. A transistor has a current gain of 175. If the base current is 0.1 mA, what is the collector current?

Q2. A transistor has a collector current of 10 mA and a base current of 40 µA. What is the current gain of the transistor?

Q3. Consider an npn transistor with v_{BE} = 0.7 V at i_C = 1 mA. Find v_{BE} at i_C = 0.1 mA and 10 mA.

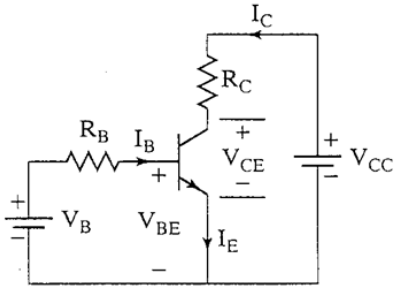
Q4. Transistors of a certain type are specified to have β values in the range 50 to 150. Find the range of their α values.

Q5. A transistor is connected as shown in figure and has a base current of 16µA and a beta of 80. What is the collector current and emitter current of the transistor?



Q6. Measurement of an *npn* BJT in a particular circuit shows the base current to be 14.46µA, emitter current to be 1.460 mA, and the base-emitter voltage to be 0.7 V. Calculate α, β, and I_S.

Q7. For the circuit shown below with R_B = 100kΩ, R_C = 2kΩ, V_B = 3V, V_{CC} = 9V and β=120, determine the collector current and V_{CE}.



Q8. Determine I_B, I_C, I_E, V_{BE}, V_{CE}, and V_{CB} in the circuit. Assume β_{DC} = 150.