Prelab – Experiment 9
Single Transistor Amplifiers

Read the Experiment 9 instructions thoroughly and then answer the following questions:

1 Question 1

Assume that Fig 8.6(a) in Sprott contains a silicon transistor with $V_{\mathrm{BE}} = 0.6\,\mathrm{V}$ and $\beta = 200$. The other circuit components are $R_1 = 20\,\mathrm{k\Omega}$, $R_2 = 1.6\,\mathrm{k\Omega}$, $R_{\mathrm{C}} = 2\,\mathrm{k\Omega}$, $R_{\mathrm{E}} = 200\,\Omega$, and $V_{\mathrm{CC}} = 21.6\,\mathrm{V}$.

Calculate the voltage gain, A, input resistance, R_{in}, and transresistance, $r_{tr} \approx r_d$ (Refer to Eqs 8.2 and 8.3 in Sprott, but neglect r_{ohmic}). Also calculate the value of V_{C} at cut off ($I_{\mathrm{C}} = 0$) and at saturation ($V_{\mathrm{CE}} = 0.2\,\mathrm{V}$).