1. (50%) When the common-emitter amplifier circuit of Fig.1 is biased with a certain $V_{BE}$, the dc voltage at the collector is found to be $+2V$. For $V_{cc}=+5V$ and $R_c=1k\Omega$, find $I_c$ and the small-signal voltage gain. For a change $\Delta V_{BE}=+5mV$, calculate the resulting $\Delta V_o$. Calculate it two ways: by finding $\Delta i_c$ using the transistor exponential characteristic and approximately using the small-signal voltage gain. Repeat for $\Delta V_{BE}=-5mV$. Summarize your results in a table.

![Fig.1](image-url)
2. (50%) In the circuit shown in following figure, measurement indicates \( V_E \) to be -0.7V and \( \beta = 50 \).

Find
(a) (12.5%) \( I_E \)
(b) (12.5%) \( I_B \)
(c) (12.5%) \( I_C \)
(d) (12.5%) \( V_C \)