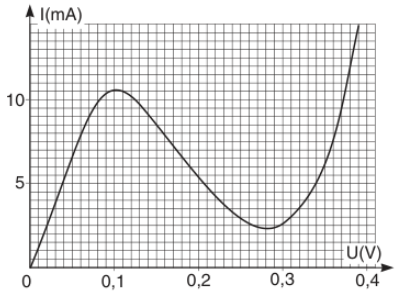
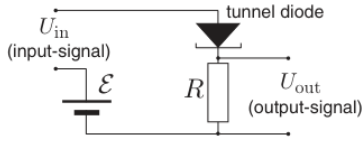
4. Tunnel diode (8 points)

Tunnel diode is a semi-conductor device, similar to the ordinary diode, the volt-amper characteristic of which is given in the attached graph. The circuit below describes a simple amplifier. The resistance $R = 10\,\Omega$, battery voltage $\mathcal{E} = 0{,}25\,\text{V}$.





1) Find the current in the circuit, if $U_{\text{in}} + \mathcal{E} = 0{,}08\,\text{V}$.

2) Find the output voltage $U_{\text{out}\,0}$ if $U_{\text{in}} = 0\,\text{V}$.

3) Find the output signal $U_{\text{out}} - U_{\text{out}\,0}$ if $U_{\text{in}} = 1\,\text{mV}$.

4) The input signal is given in the graph below. Sketch the output signal as a function of time.

