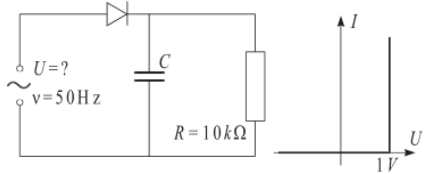
**6. Rectifier** (8 points)

A voltage rectifier is made according to the circuit depicted in Figure. The load $R = 10\,\mathrm{k\Omega}$ is fed with DC, equal to $I = 2\,\mathrm{mA}$. In what follows we approximate the U-I characteristic of the diode with the curve depicted in Figure. The relative variation of the current at the load has to satisfy the condition $\Delta I/I < 1\%$.




**1)** Find the average power dissipation at the diode at the working regime of such a circuit.

**2)** Determine the amplitude of the AC voltage (with frequency $\nu = 50\,\mathrm{Hz}$), which has to be applied at the input of the circuit.

**3)** Find the required capacitance $C$.

**4)** Find the average power dissipation at the diode during the first period (of AC input voltage) immediately following the application of AC voltage to the input of the circuit.