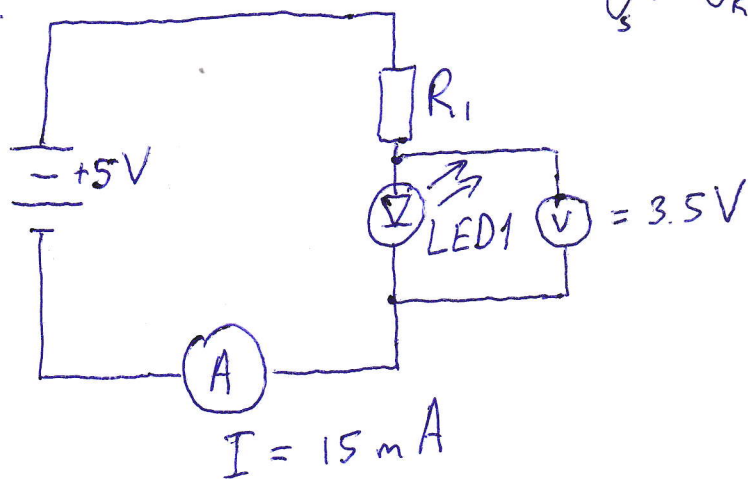


3. Given the LED V-I characteristic curve, find the value of the corresponding resistor (which limits the current through the LED) to achieve at maximum 53 mW power dissipated on the LED. LED is connected to a 5V voltage source through the resistor.

1. Using the curve it is easy to find:

$$P = U \cdot I = 3.5 \text{ V} \cdot 15 \cdot 10^{-3} \text{ A} = 0.053 \text{ W} = 53 \text{ mW}$$

2.



$$U_s = U_{R_1} + U_{LED1} \Rightarrow U_{R_1} = U_s - U_{LED1}$$

$$U_{R_1} = I \cdot R_1$$

So,

$$\begin{aligned} R_1 &= \frac{U_s - U_{LED1}}{I} = \\ &= \frac{5 \text{ V} - 3.5 \text{ V}}{15 \cdot 10^{-3} \text{ A}} = 100 \Omega \end{aligned}$$

Answer: the corresponding resistor's value is  $100 \Omega$ .