Light Emitting Diodes (LEDs) (10 points)

Part A. Volt-ampere characteristics at different temperatures (5.0 points)

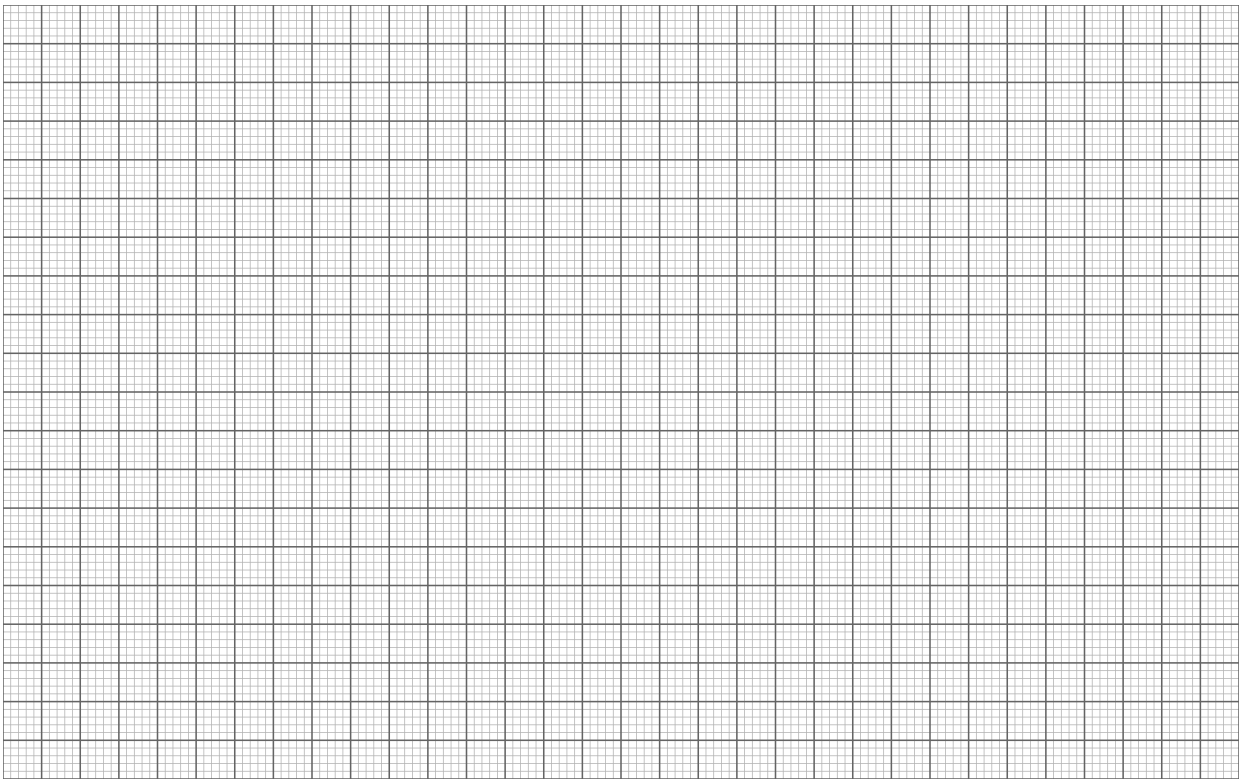
A.1 (2.5 pt)
Graph $I_{\text{LED\_pulsed}}(U_{\text{LED\_pulsed}}, T)$ dependence the room temperature, and 40, 60, and 80 °C (pulsed mode) on the millimeter paper:

A.2 (1.0 pt)
Fill the table with the corresponding values of $U_{\text{LED\_pulsed}}(I_{\text{LED\_pulsed}}, T)$:

	"Room" _____C	40 °C	60 °C	80 °C
3 mA				
10 mA				
20 mA				
40 mA				

A.3 (1.5 pt)

Graph main points of $U_{\text{LED\_pulsed}}(I_{\text{LED\_pulsed}}, T)$ (A.2) on the millimeter paper. Use linear graphical approximation to determine $\frac{\Delta U(I)}{\Delta T}$:



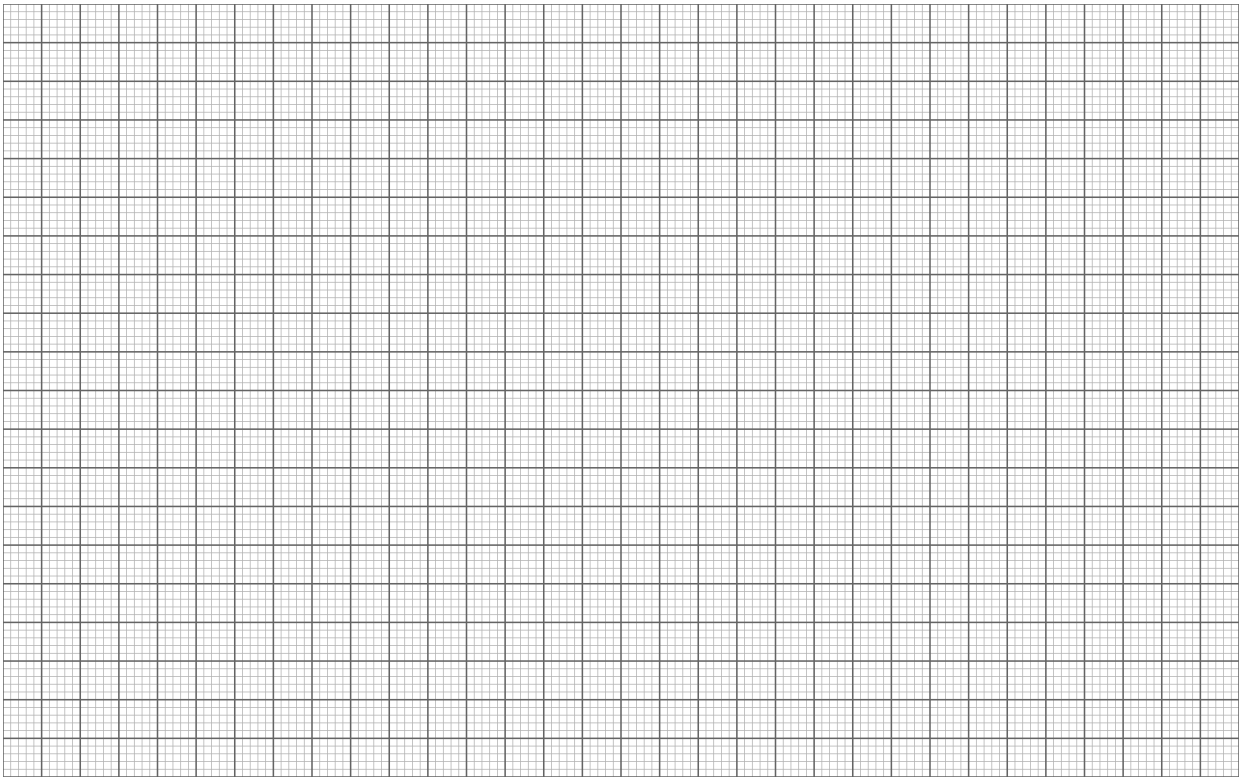
Linear graphical approximation:

I_{LED}	3 mA	10 mA	20 mA	40 mA
$\frac{\Delta U(I)}{\Delta T}$				

Part B. Measurement of the LED Volt-Ampere characteristics at continuous driving current (3.5 points)

B.1 (1.5 pt)

Graph $I_{\mathrm{LED\_continuous}}(U_{\mathrm{LED\_continuous}})$ dependence at room temperature (continuous mode) on the millimeter paper:



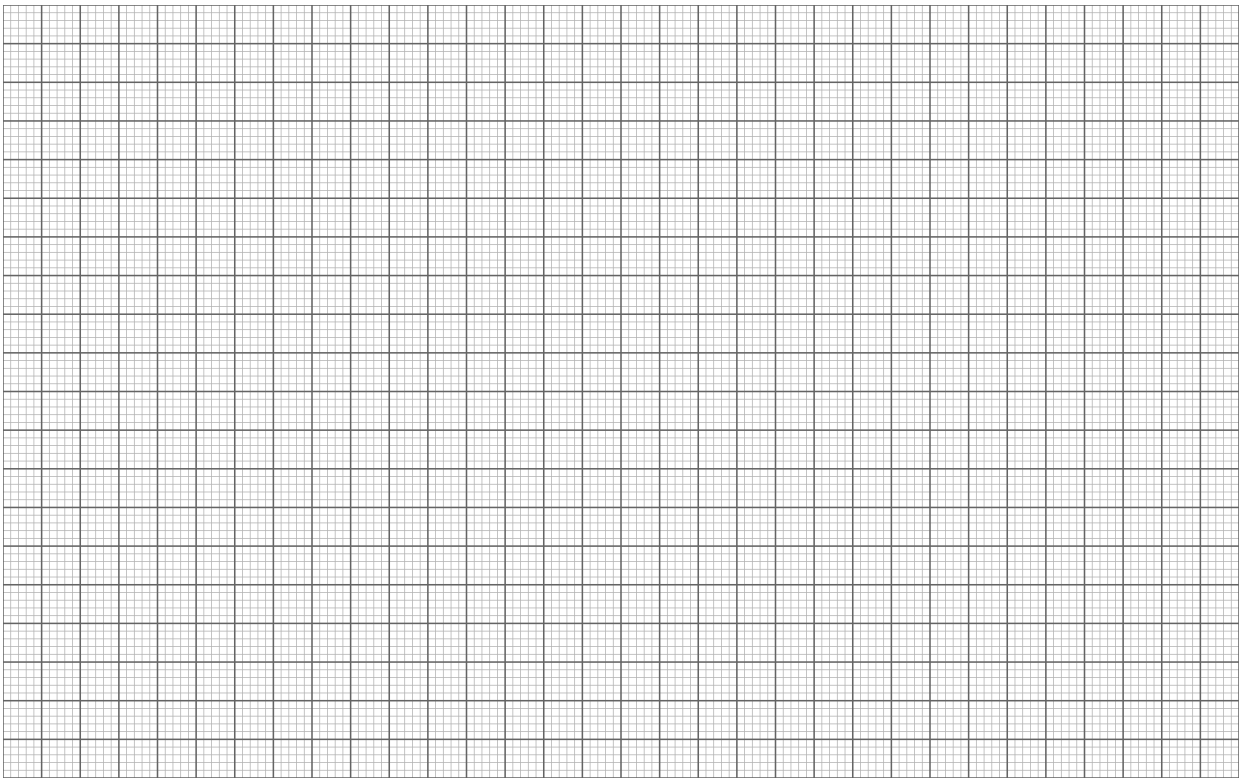
Fill the table with the corresponding values:

I_{LED}	3 mA	10 mA	20 mA	40 mA
U_{LED}				
ΔU				
T_{J}				
T_{PCB}				

B.2 (0.5 pt)

I_{LED}	3 mA	10 mA	20 mA	40 mA
$\frac{\mathrm{d}I}{\mathrm{d}U}$				

B.3 (1.5 pt)
Graph $\Delta T(P)$ on the millimeter paper:



Fill the table with the corresponding values:

I_{LED}	3 mA	10 mA	20 mA	40 mA
ΔT				

Linear LED thermal resistance $\frac{\Delta T}{P}$:

Part C. Calculation of the LED current drift due to the temperature (1.5 points)

C.1 (1.5 pt)

$I_{\mathrm{LED}}(U_{20\ \mathrm{mA}}, 0\ ^{\circ}\mathrm{C}) =$

$I_{\mathrm{LED}}(U_{20\ \mathrm{mA}}, 40\ ^{\circ}\mathrm{C}) =$