## **PHOTOMETRY**

## A. THE INVERSE SQUARE LAW

							Name	:				
							Group	):				
							Date:					
Goal of the experiment:												
Analysis of experimer	ntal err	ors:			•••••							•••••
accuracy of the luxme	eter (ty	pe KEW	5202; fo	ollowing	the pro	ducer m	nanual:	$\Delta E = \pm 4$	% of rea	nding ±5	digits),	
accuracy of the light	source	and the	luxmete	er positio	on on th	e optica	l bench	:				
$\Delta x_{s} = \Delta x_{L} = \dots$												
2. Results of measurement position of the point						f the dis	tance <i>R</i>	from th	e point l	ight sou	rce:	
	1	2	3	4	5	6	7	8	9	10	11	12
Χ <sub>L</sub> ,												
E,												
$\Delta E \xrightarrow{values}$												
$R = X_{\rm L} - X_{\rm s}$ ,												
$\Delta R = \pm$ value and unit												
$\frac{1}{R^2}$ ,												
$\Delta \left(\frac{1}{R^2}\right) = \pm \dots $ formula												
$\Delta \left( \frac{1}{R^2} \right) \xrightarrow{values}$												
Make graphs:												
a) $\mathit{E} = f(\mathit{R})$ - the illum	minanc	e as a fu	ınction o	of the di	stance f	rom the	light so	urce,				
b) $E = f\left(\frac{1}{R^2}\right)$ - the ill									ance fro	om the li	ght sou	rce.
Conclusions:												

## B. DETERMINATION OF THE LUMINOUS INTENSITY BY THE COMPARATIVE PHOTOMETRY METHOD

1. Analysis of experimental errors - accuracy of the light sources and the photometer position on the optical bench:

$\Delta x_{\rm S} = \Delta x$	<sub>U</sub> =			
Position (	of the unkn	own source	: x <sub>U</sub> ± Δx <sub>U</sub> =	
2. Position	κ <sub>Ph</sub> of the Jo	oly photome	ter on the opt	ical bench where the wax boxes are equally bright:
		1		
	X <sub>Ph</sub>	3 sign. digits		
	unit	unit	unit	
1				
2				Standard deviation: $s_{x_{p_h}} = $ 3 significant digits
3				Standard deviation of the mean: c —
4				Standard deviation of the mean: $s_{\overline{x}_{p_h}} = \dots$ 3 significan digits
5				Maximal error of the mean: $3 \cdot s_{\overline{x}_{p_h}} = \dots$ 3 significant digits
6				ਾਸ 3 significant digits
7				
8				Final result:
9				$\overline{x}_{_{ extsf{Ph}}}\pm\Delta\overline{x}_{_{ extsf{Ph}}}=$
10				· Ph — — · Ph
Sum				Error of the measurement is classified as <i>systematic accidental</i>
Mean $\overline{x}_{Ph}$				cross the invalid off
$\Delta R_{\rm U} = \Delta \bar{k}$ Wattage  3. Calculate  Estimated  Final resu	$I_{Ph} + \Delta x_{U} = 0$ of the reference of the relative luminosity of the reference of the relative luminosity of the reference of the relative luminosity of the relative luminosity of the reference of the relative luminosity of the relative luminosity of the reference of the reference of the reference of the relative luminosity of the relative luminosity of the reference of the relative luminosity of the relative luminos	rence source uminous interpretation in the calculate $\left(\frac{J_0}{J_s}\right) = \dots$	$\Delta R_{\rm S} = \Delta \overline{X}_{\rm ph}$ e: $P_{\rm S} = \dots$ ensity $\frac{I_{\rm U}}{I_{\rm S}}$ of the	$\overline{V}_{\rm Ph} =$