Examination of LED diodes

Tasks:

I.Practical measurements:

1. Measure the V-A characteristic in forward direction of LED diodes with different value of wavelenght (different color of illumination).

II. Graphics:

1. In common coordinate systems draw the V-A characteristics of all LEDs.

III. Calculations:

1. Draw the simplest electronic circuit of forward biased LED diode.
2. Calculate the current limiting resistor if the value of the forward current is I_F=10mA and the power source is E=6V.

$$R = \frac{E - U_F}{I_F}$$

Make the calculations for **blue**, **red** and **infrared** diodes.

IV. Answer the questions:

1. Explain principle of operation of LED diode.
2. What is the reason of different colors of the LEDs. What need to be the bandgap width of the semiconductor material for shorter wavelength?
3. Haw the color of illumination is connected with forward voltage of the diode?
4. What happened with LED if in the circuit there is no current limiting resistor?

Forward Characteristic:

Table 1

I_F, mA		0	1	2	3	4	6	8	10	12	14	16	18	20
U_F, V	super-light													
	blue													
	green													
	red													
	yellow													
	infrared													
	white													