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| **Faculty of Electrical Engineering** |

**Specialistic Workshop Report**

Subject: **Electrical Circuits 2**

Course code: **IS-FEE-10085S**

Exercise Number: *Enter Number*

Exercises Title: *Enter the title of the exercise*

Group Members: *First and Last Name*

*First and Last Name*

Field of Study: **-**

Type of Studies: **Erasmus+**

Semester: **Summer**

Date of Exercise: *Enter the date*

Instructor: **Jarosław Forenc, PhD**

Grade and Date:

# 1. Objective and Scope of the Exercise

Briefly state the objective and scope of the exercise. Include a diagram of the measurement setup, a list of tested elements, measuring instruments, and other equipment used.



Fig.1.1. Measurement system diagram

Legend:

*Rw* – limiting resistor, Ω

*Zx* – measured impedance, Ω

*I* – current in the circuit, A

*U1, U2, U3* – voltage drops across circuit elements, V

*V* – digital voltmeters

# 2. Exercise Procedure

Description of the exercise procedure.

Describe the implemented measurement procedure; this can be done in bullet points.

Present measurement results, observations, calculations, etc.

Use the following format for bullets within chapters:

* first point;
* second point;
* last point.

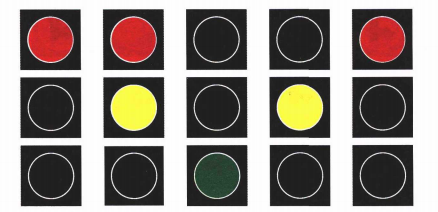


Fig. 2.1. Title of the figure – description in Times New Roman, Italic, 10 pt, justified, 1.5 line spacing



Fig. 2.2. Characteristics of Fe content variation in the alloy depending on deposition time and the substrate used (aluminum, brass, silver): axis labels including units separated by a comma and a space from the quantity name, known measured values marked with dots, symbols (e.g. t – time) can be used instead of quantity names, drawn characteristics approximate value changes, axis scales chosen for readability and plot area coverage, optional grid lines



Fig. 2.3. Characteristics of microhardness and friction mark depth changes depending on the presence and orientation of the external magnetic field – EMF (1 – no EMF, 2 – parallel EMF orientation, 3 – perpendicular EMF orientation); bar charts – microhardness; line charts – friction mark depth: additional axes (X and/or Y) may be added for clarity and surface coverage, arrows linking the plot with an axis or a suitable caption can be added under the figure

Formulas should be placed on a separate line, formatted in "Wzór" style using tab spacing as shown below:

(1)

where: *K* – particle shape factor (varies with crystal shape); *λ* – wavelength of molybdenum X-ray radiation, m; – Bragg angle for reflection (hkl), rad; *βhkl* – width of the highest reflection peak (hkl) at half its height, rad.

Tables are numbered using the "Table Caption" style. Line spacing inside tables should be set to 1.0. Table references in text should be written in full, e.g.: "Table 2.1 presents the measurement results…" Units in tables should not be placed in any brackets (see examples below).

Table 2.1. Title of the table (Times New Roman, Italic, 10 pt, justified, 1.5 line spacing)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Lens Diameter | Signal color | | | | | | | |
| red | | yellow | | gree | | white | |
| Imin | Imax | Imin | Imax | Imin | Imax | Imin | Imax |
| mm | A | A | A | A | A | A | A | A |
| 100 | 100 | 100 | 100 | 400 | 200 | 400 | 200 | 400 |
| 200 | 200 | 400 | 400 | 1000 | 800 | 1000 | 400 | 1000 |
| 300 | 800 | 1100 | 1100 | 2500 | 2000 | 2500 | 1000 | 2000 |

or

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Lens Diameter, mm | Signal color | | | | | | | |
| red | | red | | red | | red | |
| Imin, A | Imax, A | Imin, A | Imax, A | Imin, A | Imax, A | Imin, A | Imax, A |
| 100 | 100 | 100 | 100 | 400 | 200 | 400 | 200 | 400 |
| 200 | 200 | 400 | 400 | 1000 | 800 | 1000 | 400 | 1000 |
| 300 | 800 | 1100 | 1100 | 2500 | 2000 | 2500 | 1000 | 2000 |

Code fragments and programs should be formatted using the "Source Code" style, with descriptions in the "Table Caption" style.

Program 5.3. Code responsible for sending the SUP command and waiting for the response (Times New Roman, Italic, 10 pt, justified, 1.5 line spacing)

QByteArraykomenda="00001SUP"; // konstrukcja komendy

serial->write(przygotowanieRamki(komenda)); //wyslanie komendy

QEventLooploop;

QTimer::singleShot(1000,&loop,SLOT(quit()));

//czekanie na wszystkie odpowiedzi

loop.exec();

# 3. Conclusions

Conclusions – preferably listed as bullet points.

Reference the obtained results against the expected – theoretical ones.

Compare the results with the nominal values of the tested components.

Analyze discrepancies between obtained and expected values.

Discuss practical applications.

Conclusions and comments should be written by all laboratory team members (even just before submission – handwritten if submitting a printed version)

The report text should be justified and free of widows, orphans, and dangling lines.

The required font is Times New Roman, 12 pt, with 1.5 line spacing.

It is recommended to check the language correctness of the report using, for example, ChatGPT (version 3.5 is freely available and fully sufficient for this purpose).

The report should also include a list of sources, e.g. links to websites used during the work