REVIEWER'S OPINION OF FINAL THESIS

I. IDENTIFICATION DATA

Thesis name:	**Electronic detection of drugs by nanoparticles covered interdigitated sensors**
Author's name:	**Rustambek Bekmukhamedov**
Type of thesis :	bachelor
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Physics
Thesis reviewer:	Mgr. Oleg Babčenko, Ph.D.
Reviewer's department:	Department of Physics

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment — **ordinarily challenging**

Evaluation of thesis difficulty of assignment.

The thesis assignment, related to familiarization with the impedance spectroscopy, interdigitated electrode sensors and nanoparticles with further use in the research, was sufficiently challenging for bachelor's degree application and had required intensive work.

Satisfaction of assignment — **fulfilled**

Assess that handed thesis meets assignment. Present points of assignment that fell short or were extended. Try to assess importance, impact or cause of each shortcoming.

The all tasks were accomplished according the assignment.

Method of conception — **correct**

Assess that student has chosen correct approach or solution methods.

The chosen approach meets assignment requirements.

Technical level — **B - very good.**

Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.

The thesis has a good technical level with included equations that explain impedance spectroscopy principles. Student demonstrate thoroughness in a work with literature with focusing on details, e.g. the measurements errors coming from the set up were considered.

Formal and language level, scope of thesis — **A - excellent.**

Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.

The thesis is well-written in a good scientific English.

Selection of sources, citation correctness — **B - very good.**

Present your opinion to student's activity when obtaining and using study materials for thesis creation. Characterize selection of sources. Assess that student used all relevant sources. Verify that all used elements are correctly distinguished from own results and thoughts. Assess that citation ethics has not been breached and that all bibliographic citations are complete and in accordance with citation convention and standards.

The student use relevant sources (review publications) that gave him reasonable introduction into the topic. On the other hand, the amount of used sources can be broader for comparison and deeper insight. The high percentage of the on-line documentation to employed in the research equipment given as references also need to be mentioned.

Additional commentary and evaluation

Present your opinion to achieved primary goals of thesis, e.g. level of theoretical results, level and functionality of technical or software conception, publication performance, experimental dexterity etc.

The thesis meets the assignment requirements and demonstrates student's skills and very good scientific potential. The

discussion of observed results is probably affected by so far not enough student's experience with the employed analytic equipment. On the other hand, considering of measurement errors in thesis indicates that student pay attention to the details and is aware of the possible difficulties.

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Summarize thesis aspects that swayed your final evaluation. Please present apt questions which student should answer during defense.

The proposed thesis deals with the impedance spectroscopy and use of interdigitated electrode sensors including their modification by nanoparticles for bio-electronic studies. The assigned task was to familiarize with the above mentioned issues. In general, the assignment was time-consuming and requires critical thinking, but do not demand specific creativity. The assignment requirements accomplishing and good understanding of topic by the author is demonstrated by the given overview and the experimental work in the diploma thesis. The thesis has good language level, is well-structured and reveals student's skills and very good scientific potential. The minor objection is related to the discussion of observed results, which is probably affected by so far not enough student's experience with the employed analytic equipment. From my point of view it could be avoided in case of broader literature review and deeper insight On the other hand, considering of measurement errors in thesis indicates that student pay attention to the details and is aware of the possible difficulties.

I evaluate handed thesis with classification grade **B - very good.**

Question: Did you somehow inspect the nanoparticles distribution on the interdigitated sensors?

Date: **12.6.2018** Signature: