STATEMENT OF OPINION

by Professor Rumen Kostadinov Popov, PhD at University of Plovdiv "Paisii Hilendarski" on the materials, submitted for participation in the competition for taking the academic position of 'Professor' at Plovdiv University "Paisii Hilendarski" ,

in the higher education area 'Technical Sciences", professional field 5.2 Electric Power Engineering, Electronics and Automation (Automated Information Processing and Control Systems)

In the competition for "professor", announced in the State Gazette, issue 98 of 19.11.2024 and on the website of Plovdiv University "Paisii Hilendarski" for the needs of the Department of "Electronics, Telecommunications and Information Technologies" at the Faculty of Physics and Technology, the only candidate is Assoc. Prof. Dr. Eng. Nadezhda Miteva Kafadarova from the Department of EKIT of the Faculty of Physics and Technology of Plovdiv University "Paisii Hilendarski"

1. General presentation of the received materials

By order No. РД – 22-437 of 18.02.2025 of the Rector of Plovdiv University "Paisiy Hilendarski" (PU), I have been appointed as a member of the scientific jury of a competition for the academic position of 'professor' at PU in the field of higher education "Technical Sciences", professional direction 5.2 "Electrical Engineering, Electronics and Automation", announced for the needs of the Department of "Electronics, Telecommunications and Information Technologies" at the Faculty of Physics and Technology.

Only one candidate has submitted documents to participate in the announced competition: Assoc. Prof. Dr. Eng. Nadezhda Miteva Kafadarova from the "Paisiy Hilendarski" University, Department of Electronics, Communications and Information Technologies at the Faculty of Physics and Technology.

The materials presented by Assoc. Prof. Dr. Eng. Nadezhda Miteva Kafadarova are in accordance with the Regulations for the Development of the Academic Staff of the University of Plovdiv. The candidate has presented a total of 70 scientific works, of which 10 scientific publications equivalent to a monograph, 33 publications in publications that are referenced and indexed in world-renowned databases and 27 publications in non-refereed journals with scientific review or in edited collective volumes. Participation in 11 research projects (international, national and faculty) is indicated, of which 9 have been completed and two are ongoing, including management of 2 projects. 1 patent application has been submitted. The listed scientific works are outside the dissertation and associate professorship of the participant in the competition and I accept them for review (preparation of an opinion).

2. Brief biographical data of the candidate

Assoc. Prof. Nadezhda Miteva Kafadarova was born in 1969. In 1988 she graduated from the Bulgarian State University of Applied Sciences and Arts "Georgi Kirkov" – Plovdiv with a degree in English. She completed her master's degree at the Technical University of Sofia – Plovdiv branch in 1993 with a degree in "Electronics and Microelectronics". In 2010 she obtained the ONS "Doctor of Engineering" in the field of microelectronics.

Assoc. Prof. Dr. Nadezhda Miteva Kafadarova has over 31 years of teaching and research experience. Her professional experience is fully sufficient in connection with the announced competition.

3. General characteristics of the candidate's activities

3.1.Evaluation of teaching and learning activities

The classroom and extracurricular teaching load of Assoc. Prof. Kafadarova in the years since 2010 has varied from 645 to 670 hours. The data presented shows that the candidate has developed 14 curricula for educational qualification degrees "bachelor" and "master". Since 2014, Assoc. Prof. Kafadarova has supervised 15 successfully defended diploma students and two defended doctoral students. Assoc. Prof. Kafadarova's pedagogical training is at a high level with in-depth theoretical and practical knowledge.

3.2. Evaluation of the candidate's scientific activity

My detailed acquaintance with the publication and research activities of the candidate for the academic position of 'professor' gives me reason to systematize, summarize and accept the following scientific and applied scientific contributions:

3.2.1. Contributions

Scientific contributions:

1. A comparative analysis of the capabilities of modern methods for predictive management of the performance of energy-converting elements has been carried out. A methodology for assessing the aging of electrochemical batteries using artificial intelligence and machine learning has been developed and tested. A portable system for monitoring the current state of batteries has also been created. [1h, 2h, 3h, 4h, 6h, 7h, 8h, 10h, 48, 60].

2. A methodology has been created for the application of innovative technologies in the education of engineering students during Covid-19. The effectiveness of remote access and distance learning has been compared with that of face-to-face learning [40, 41, 46, 51, 52, 53, 55, 56,].

Applied scientific contributions:

1. An automated experimental apparatus with unique characteristics was designed and developed to create a database of informative parameters for predicting the performance of batteries. Hybrid and fusion prediction of the functionality of energy conversion elements was performed [5h, 9h];

2. It was studied with the aim of predicting heat transfer of electronic equipment. CFD modeling of thermal processes in various electronic assemblies and devices was performed. The developed CFD model and intelligent sensor node for temperature measurement were implemented in the training of engineering students. [3, 6, 7, 17, 20, 23, 25, 29, 30, 33, 34, 35, 36, 37, 38, 42, 47];

3. Educational resources have been designed, developed and experimentally tested to study the effectiveness of introducing augmented reality and mobile technologies in the education of students with and without disabilities. [1, 2, 4, 8, 12, 13, 14, 15, 16, 19, 28, 32, 45].

4. An innovative system of exercises for developing self-control using mobile technology has been developed [5, 9, 10].

5. An original approach to teaching engineering students using QR codes has been developed and implemented to increase their motivation [18, 24, 27, 31]

6. A unique system for the identification of edible oils by analyzing their thermo-physical properties has been developed. The method is based on the use of active infrared thermography.

The developed system overcomes the limitations of other methods that determine only the thermal conductivity coefficients of oils by resistive heating of the sample [59].

7. A new course on 5G antenna studies for students studying telecommunications has been developed and adapted to e-learning. An embedded system for measuring the radiation pattern of antennas has been designed and implemented. Hardware modules for laboratory exercises in a remote telecommunications laboratory and the methodology for conducting exercises remotely have been developed. A model for a remote laboratory system has been developed [39, 43, 44, 49, 50].

8. A methodology for using QR codes in dental practice has been developed, implemented and tested, which represents a creative and positive way to integrate technology into the work of dentists. A deep learning model predicting a trend for a positive effect of preventive analgesia in oral surgery for tooth extraction has been developed and tested [26, 58].

3.2.2. Citations

183 citations are presented, of which 113 are in scientific publications, referenced and indexed in world-renowned databases SCOPUS and Web of Science and 70 are in non-refereed journals with scientific review. They cover with a huge reserve the required 100 points according to indicator D.

4. Assessment of the candidate's personal contribution

I believe that the candidate's personal contribution to the relevant publications is his personal merit.

5. Critical remarks and recommendations

I have no significant comments on the presented scientific works. I recommend the publication of more textbooks and teaching aids that will be useful for student education, as well as the publication of independent scientific works.

6. Personal impressions

My impressions of the participant in the competition are excellent and gained from our joint work with doctoral students. She is an authoritative lecturer who is respected among colleagues and students. The large number of scientific papers abroad with Impact Factor and with referencing on Web of Science, Scopus is extremely impressive.

CONCLUSION

The documents and materials submitted by Assoc. Prof. Dr. Nadezhda Miteva Kafadarova meet all the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADSRB), the Regulations for the Implementation of the ЗРАСРБand the relevant Regulations of the University of Paisiy Hilendarski.

The candidate in the competition has presented a significant number of scientific works published after the materials used in the defense of the ONS 'doctor' and associate professor. The candidate's works contain original scientific and applied contributions that have received international recognition. His theoretical developments have practical applicability, some of which are directly oriented towards academic work. The scientific and teaching qualifications of the participant in the competition are undoubted.

The results achieved by Assoc. Prof. Dr. Nadezhda Miteva Kafadarova in the educational and research activities fully comply with the specific requirements of the Faculty of Physics and Technology, adopted in connection with the Regulations of the University for the Implementation of the ЗРАСРБ.

Getting acquainted with the submitted materials for the competition and the scientific papers, analyzing their significance and the contributions achieved, allows me to give my positive assessment and recommend to the Scientific Jury to prepare a report-proposal to the Faculty Council of the Faculty of Physics and Technology for the election of Assoc. Prof. Dr. Nadezhda Miteva Kafadarova to the academic position of 'professor' at PU "P. Hilendarski" in professional field 5.2 "Electrical Engineering, Electronics and Automation" (Automated Information Processing and Control Systems).

April.17.2025 г. Prepared the opinion:

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(Prof. Dr. Eng. Rumen Popov)