R E V I E W

by Professor Asya Georgieva Stoyanova-Doycheva, PhD,

University of Plovdiv "Paisii Hilendarski", Plovdiv

of the materials submitted to the competition

for the academic position **"Associate Professor"**

of the University of Plovdiv "Paisii Hilendarski"

Field of higher education: 4. Natural sciences, Mathematics, and Informatics,

Professional field: 4.6 Informatics and Computer Science

(Artificial Intelligence)

In the competition for "Associate Professor", announced in the State Gazette, № 96 of 17.11.2023 and on the website of the University of Plovdiv "Paisii Hilendarski" for the needs of the Department of Computer Systems of the Faculty of Mathematics and Informatics, Chief Assistant Professor Asya Todorova Toskova, PhD, from the Department of Computer Informatics, Faculty of Mathematics and Informatics at the University of Plovdiv "Paisii Hilendarski" and Chief Assistant Professor Veneta Veselinova Tabakova-Komsalova, PhD, from the Department of Computer Informatics, Faculty of Mathematics and Informatics at the University of Plovdiv "Paisii Hilendarski", participate as a candidate.

1. Presentation of the received materials

By Order № RD-21-70 of 16.01.2024 of the Rector of the University of Plovdiv "Paisii Hilendarski", I have been appointed as a member of the scientific jury of the competition for the academic position "Associate Professor" at the University of Plovdiv (PU), in field of higher education 4. Natural Sciences, Mathematics, and Informatics, professional field 4.6. Informatics and Computer Science (Artificial Intelligence), announced for the needs of the Department of Computer Systems at the Faculty of Mathematics and Informatics.

For participation in the announced competition, **two candidates have submitted documents:**

Chief Assistant Professor Asya Todorova Toskova, PhD, from the Department of Computer Informatics, Faculty of Mathematics and Informatics at the University of Plovdiv "Paisii Hilendarski"

Chief Assistant Professor Veneta Veselinova Tabakova-Komsalova, PhD, from the Department of Computer Informatics, Faculty of Mathematics and Informatics at the University of Plovdiv "Paisii Hilendarski"

Presented by **Ch. As. Prof. Asya Todorova Toskova, Ph.D.** the set of materials on electronic media includes the documents described in the candidate's application to the Rector of PU with registration index **RASD-08-6 /11.01.2024**:

● application to the Rector for admission to the competition;
● CV in European format;
● Higher education diploma with a Master's degree annex (original and copy);
● PhD diploma (original and copy);
● list of publications;
● report on compliance with minimum national and additional faculty requirements;
● annotations of the publications in accordance with Article 65 of the Regulations for the development of the academic staff of the Plovdiv University (in Bulgarian and foreign languages);
● self-assessment of contributions (in Bulgarian and foreign languages);
● declaration of originality and authenticity of the attached documents;
● certificate of work experience;
● documentation of academic work;
● study textbook;
● documents of research work;
● research papers (monograph and copies of publications);
● project participation certificates;
● evidence of presented papers.

The set of paper materials submitted by Ch. As. Prof. Asya Todorova Toskova is in accordance with the Law on the Development of the Academic Staff of the University of Plovdiv.

Presented by **Ch. As. Prof. Veneta Veselinova Tabakova-Komsalova, Ph.D.** the set of materials on electronic media includes the documents described in the candidate's application to the Rector of PU with registration index **RASD- 08-11 /15.01.2024:**

● application to the Rector for admission to the competition;
● CV in European format;
● diplomas for higher education with an acquired educational and qualification degree "master" with application;
● diploma for educational and scientific degree "doctor";
● list of all scientific works;
● list of works for participation in the competition;

● protocol for distribution of authorship on “ARTIFICIAL INTELLIGENCE IN 24.../” book one;
● copies of publications;
● list of citations;
● list of reviews of scientific works;
● certificate of compliance with the minimum national requirements for direction 4.6;
● reference for scientific works according to the minimum national requirements for direction 4.6;
● certificate of compliance with the additional requirements of the FMI at the PU, according to Art. 65.(3) of the of the Regulations for the development of the academic staff of the Plovdiv University;
● annotation of the materials in Bulgarian;
● annotation of materials in English;
● self-assessment of contributions in Bulgarian;
● self-assessment of contributions in English.
● declaration of originality and authenticity of the attached documents;
● certificate of work experience;
● reference for classroom and non-classroom employment;
● reference for work with students;
● list of published teaching materials;
● reference for scientific research activity;
● reference for participation on research and international projects;
● certificate of participation in international and national scientific forums;
● certificate of membership in an authoritative professional organization in the relevant scientific field;
● certificates for presented papers

The set of paper materials submitted by Ch. As. Prof. Veneta Veselinova Tabakova-Komsalova is in accordance with the Law on the Development of the Academic Staff of the University of Plovdiv

2. Brief biographical details of the candidates

Chief As. Prof. Dr. Asya Todorova Toskova graduated in 1990 from Plovdiv University, Faculty of Physics, specialty " Engineer - Physics" - Bachelor. In 1991 she graduated from the same faculty of Plovdiv University (PU) with a Master's degree in Teacher of Physics and

Engineer of Solid State and Optoelectronics. From 2006 to 2012 Dr. Asya Toskova worked as a physicist in the Department of Methodology of Physics Education at the Faculty of Physics of PU. From 2012 to 2015 she was the administrative secretary at the same faculty. In 2015, the candidate obtained a Master's degree in Informatics at the Faculty of Mathematics and Informatics of PU. From 2014 to 2019 he was a part-time assistant professor and assistant professor at the Department of Computer Systems of the Faculty of Mathematics and Informatics of PU. In 2019 he defended his dissertation thesis on " Models for self-learning and learning in the field of robotics" and received a diploma of educational and scientific degree "Doctor" in the professional field: informatics and computer science, doctoral program: informatics. Since 2020, he has been a Chief Assistant Professor at the Department of Computer Systems, where he teaches mandatory courses in software engineering and elective courses in artificial intelligence. According to the attached work experience certificate, Dr. Asya Toskova has teaching experience of 7 years and 7 months, of which 3 years and 9 months as a Chief Assistant Professor in the Department of Computer Systems. From the presented list of scientific research work I find that Dr. Asya Toskova is the author of 20 scientific publications, 1 monograph, 1 textbook, 53 citations. The candidate has attached official certificates for participation in 6 research projects, of which 1 international, 2 under National Programmes, 1 under the Ministry of Education and Science and 2 under the Research Fund of PU. Dr. Asya Toskova is a member of the John Atanasoff Association of Automation and Informatics (SAI) since 2017.

Chief As. Prof. Dr. Veneta Veselinova Tabakova-Komsalova graduated from the Faculty of Mathematics and Informatics of PU in 1999 with a Master’s degree in mathematics and specialization in Informatics. In 2002 she graduated with a Master's degree in Macroeconomics - Organization and Technology of Accounting from the Faculty of Economics at Plovdiv University. In 2018 she obtained the educational and scientific degree "Doctor" by defending her dissertation thesis on " Forming algorithmic thinking in primary and secondary school students through the teaching of informatics and information technology" in the professional field 1.3 Pedagogy of education in..., doctoral program: Methodology of education in informatics and information technology. She worked as a teacher of informatics and information technology from 1999 to 2011 at the Secondary School. From 2011 to October 2020 Dr. Veneta Tabakova-Komsalova worked as a Chief Expert and Head of the Department of APFSIE at the Regional Department of Education, Plovdiv. Since November 2020 she has been a Chief Assistant Professor at the Department of Computer Systems at the Faculty of Mathematics and Informatics of PU, where she teaches mandatory courses in Artificial

Intelligence and Databases and elective courses in the field of Artificial Intelligence. From the work experience certificate attached to the documents, Dr. Veneta Tabakova-Komsalova has 14 years and 7 months of teaching experience, of which 3 years and 2 months as a Chief Assistant Professor at the Department of Computer Systems at the Faculty of Informatics of PU. She is the author of 48 scientific works, including 2 monographs, 1 textbook, 53 citations and has attached official certificates for participation in 8 scientific research projects - 1 international, 3 to the Research Fund of PU, 2 to National Programs, 2 to the Ministry of Education and Science (one of which she is the leader). Dr. Veneta Tabakova-Komsalova is a member of the John Atanasov Association of Automation and Informatics (SAI) and the Bulgarian Mathematicians' Association (BMA).

From the information presented, both candidates have the necessary qualifications, teaching experience and scientific activity that are required to participate in the competition for Associate Professor.

3. General description of the candidates' activities

3.1. Teaching and pedagogical activities

Teaching activity of the **Ch. As. Prof. Asya Toskova** includes developing and leading exercises in mandatory courses "Software Technologies", "Introduction to Software Engineering" and "Software Technology Practicum" at the Department of Computer Systems and has also developed and taught elective courses in "Cognitive Robotics" and "Machine Learning". The courses have been taught to undergraduates in full-time and part-time studies in "Computer Science", "Business Information Technologies", "Software Technologies and Design", "Software Engineering" and Masters in "Software Technologies with specialization...." - 2-year course of study at the Faculty of Mathematics and Informatics of PU. Dr. Asya Toskova has also conducted lectures on "Software Technologies" at the specialty "Software Technologies and Design" 2 year full-time and part-time study. Dr. Asya Toskova's teaching intensity is high and exceeds the yearly academic workload of 360 hours, and on average for the last 3 years she has an academic workload of 595 hours.

Teaching materials. Chief As. Prof. Dr. Asya Toskova participated in the competition with one textbook, where she is a sole author - "UML Modeling - Planning Software Success", published in 2023 by the publishing house of PU "P. Hilendarski". The textbook is 106 pages long and covers the Unified Modeling Language specification. Many examples are provided to illustrate and better understanding the material on modeling object-oriented software

applications. The textbook was developed for the “Software Technology” and “Introduction to Software Engineering” courses in the Department of Computer Systems for majors in “Software Engineering”, “Business Information Technology”, “Software Technology and Design”, and “Informatics”, in which area the great part of the candidate's auditoral hours are spent. The textbook **does not correspond** to the subject of the competition**.**

Preparation of Diploma students. Under the supervision of Chief As. Prof. Dr. Asya Toskova in the period from 2014 to 2023 inclusive, has successfully defended diploma thesis one student in 2022.

The teaching activity of As. Prof. Dr. Veneta Tabakova-Komsalova includes developing and conducting exercises in mandatory courses "Databases", "Artificial Intelligence" and "Intelligent Systems" at the Department of Computer Systems. The disciplines are taught to bachelors in full-time and part-time studies. The disciplines are taught to undergraduates in "Informatics", "Business Information Technologies", "Software Technologies and Design", "Software Engineering" and masters in "Software Technologies with specialization..." - 2-year course of study at the Faculty of Mathematics and Informatics of PU. In the above-mentioned master's program, Dr. Veneta Tabakova-Komsalova has also taught lectures in the discipline "Databases". Dr. Veneta Tabakova-Komsalova has developed and taught the elective course "Introduction to Artificial Intelligence and Prolog Logic Programming" at the “Business Information Technology”, “Software Technology and Design”, “Business Mathematics and Information Technology”, “Mathematics and Educational Management” programs at the Faculty of Management and Informatics of PU. She has also taught classes in "Computer Modelling" at the Department for Qualification and Professional Development of Pedagogical Specialists at PU "P. Hilendarski". Dr. Veneta Tabakova-Komsalova's teaching workload is high and exceeds the yearly norm of 360 teaching hours, with an average of 555 teaching hours for the last 3 years.

Teaching materials. Chief As. Prof. Dr. Veneta Tabakova-Komsalova participated in the competition with one textbook - " Textbook on Artificial Intelligence", published in 2022 in the publishing house of Plovdiv University "Paisii Hilendarski". The textbook is co-authored (3 co-authors), and it is not clear what the involvement of each of them is. The volume of the textbook is 143 pages and covers mainly the syntax of the Prolog language. Classical search methods in Artificial Intelligence are covered, and many examples are presented. The textbook is developed according to the curriculum of the courses “Artificial Intelligence” and

“Intelligent Systems”, which are taught in the Computer Systems Department for “Informatics” and “Software Engineering” majors, where the candidate has the most teaching hours. The textbook corresponds to the subject of the competition.

Preparation of Diploma Students. Under the supervision of Chief As. Prof. Dr. Veneta Tabakova-Komsalova in the period 2020 to 2023 inclusive have successfully defended three Diploma students - 1 in 2021 and 2 in 2022.

It is notable the large amount of annual workload of the candidates - with the norm of 360 training hours, they perform on average more than 550 training hours. Of the teaching materials reviewed, one was outside the scope of the competition.

3.2. Scientific and scientific applied activity

Chief Assistant Professor Dr. Asya Toskova is participating in the current competition with a total of 21 scientific publications, in addition to those that earned her the educational and scientific degree of "Doctor" and the academic position of "Chief Assistant Professor". There are 13 scientific works were published abroad. Of these, 1 publication with impact factor is *Genetic Algorithm for a Learning Humanoid Robot. In Comptes rendus de l'Acade'mie bulgare des Sciences, 72 (8) pp. 1102-1110*, which she co-authored. One solo monograph in English, published by the “Prof. Marin Drinov” Publishing House, Bulgarian Academy of Sciences. Publishing 15 scientific papers in a foreign language (English), including the above monograph. Dr Asya Toskova has published a total of 13 scientific papers in 6 foreign and international journals - International Conference Automatics and Informatics - 4 scientific papers, AIP Conference Proceedings - 1 scientific paper, International Conference on Intelligent Systems - 4 scientific papers, Springer, Cham - 1 scientific paper, Comptes rendus de l'Acade'mie bulgare des Sciences - 1 scientific paper, ACM International Conference Proceeding Series - 1 scientific paper, 8 scientific papers have been published in Bulgarian journals. Three of the scientific works of Dr. Asya Toskova are solo - these are the works with the numbers [1, 13, 18] from the list of scientific works for participation in the competition, the remaining 18 are co-authored. The proposed 21 scientific papers are in the field of the competition, and 13 of them are refereed in the SCOPUS and/or Web of Science databases.

In the report on the minimum national requirements according to the RB PPHRAS, Dr. Asya Toskova scored 50 points for indicator group A, indicate group B - 100 points, indicator group G - 345 points, indicator group D - 212 points and indicator group E - 70 points. In total 777

points with a minimum requirement of 400 points. For indicator group D, in the reference for the minimum national requirements, the candidate has marked articles published in the International Conference on Intelligent Systems [7,8,9 and 10] as SJR articles and awarded them 30 points each. After checking with NACID, it is clear that the same conference does not have an SJR, which gives me reason to award each of the four papers 18 points. Thus, under Indicator Group D, I award 297 points. I have also not awarded the points for the textbook under group E (which is not mandatory for the academic post of Associate Professor in field 4.6 according to the requirements of the Law for the Development of Academic Staff Act in the Republic of Bulgaria) due to the inconsistency in the subject of the competition. Thus, the total number of points of the candidate is 709 points. The corrections are presented in Table 1. In despite of the correction, the candidate's scientific production meets and exceeds the minimum national requirements of the of the Law for the Development of Academic Staff Act in the Republic of Bulgaria.

Chief As. Prof. Dr. Asya Toskova meets the additional requirements of the FMI of PU by exceeding them significantly (See Table 1). However, it is not immediately clear why the relevant reference indicates that the candidate participated in the competition for " Associate Professor" with 28 articles, while the list of research papers for the competition includes only 21. After reviewing Dr. Asya Toskova's reference on scientific activity, I found that there is an equation of the monograph to 6 articles and a book chapter to 3 articles, which is allowed in the additional requirements of the FMI at PU (https://procedures.uni-plovdiv.bg/docs/additional/fmi.pdf). The equating does not change the number of research papers for the competition, which is 21. The same document states that the candidate has two publications with impact factor. On examination of the research activity reference, I found that there is only one article with IF, recorded twice in the document - once as a publication and once as a journal article. I believe that the documents: additional requirements of the FMI and the scientific activity report of Dr. Asya Toskova are not clearly enough formulated.

Contributions. The scientific contributions of Dr. Asya Toskova I define them as scientific and scientific applied and the main contributions of the candidate are in the field of Machine Learning. The research work of the author in this direction is presented and summarized in the monograph "Some Studies in Machine Learning - Computer Vision & Recommendation" [1]. The monograph is in English, 106 pages in volume. The book is published by Prof. Marin Drinov, Bulgarian Academy of Sciences. It presents the development and testing of computer vision modules and personalized recommendations that solve specific problems. Their

principles of their functioning are described. Various machine learning techniques are used and the theoretical concepts underlying the methods used are also presented. The directions in which machine learning techniques have been applied are three:

- Detection of weeds in wheat. The author used a Convolutional Neural Network (CNN) implemented in Python. A Wheat-Weed Dataset of 4647 images of weeds and wheat was created to train the network. The dataset is freely available to all interested machine learning researchers and can be found at: https://github.com/asydesign/Wheat-Weed-Dataset.git. This includes research papers [8, 9, 3, 2] from the list of research papers for the competition.
- Recognition of Bulgarian embroidery. Main publications on the topic are [10, 15]. In the document of self-assessment of contributions, a publication with number 6 is included in this field, which is not present in the list of scientific works for participation in the competition.
- Recommendation of serious games to children with special educational needs (SEN). A module has been created to recognize user preferences and recommend personalized resources in a game-based learning platform designed for students with SEN. The module uses a content-based recommender system implemented in Java. A Bayesian classifier was created for training the recommender system, also implemented in Java. Publications [13, 4] from the list of research papers for the competition are included here.

In the self-assessment of the contributions of Dr. Asya Toskova are not included scientific works with the numbers [5, 6, 7, 11, 12, 14, 16, 17, 18, 19, 20, 21] from the list of scientific works for participation in the competition, in which she is an author or co-author. The research papers present developments in the following areas: Smart sensor networks - smart sensors, intelligent control of IoT devices, multi-agent sensor networks are discussed [5, 6, 11, 14, 17, 19]; Robotics - the research papers are related to the creation of a prototype of a self-learning module for a personal assistant operating on a humanoid robot [16, 18 and 21]. The other three research works are in the direction of creating intelligent assistants in different areas (e-learning, intelligent agriculture and fault prediction and preventive maintenance) - [7, 12, 20]. Because the author did not include the papers in the "Self-assessment of contributions" document, it is not clear what his personal contributions are to these research papers.

Citations. Dr. Asya Toskova has submitted a list of 53 citations. 27 of the citations are in SCOPUS and/or Web of Science, 26 outside these databases and 34 of the citations are of Bulgarian authors. The number of citations of the author's scientific works shows that the candidate's scientific developments are accepted with confidence by the scientific community.

Other indicators on the candidate's overall scientific activity

Chief As. Prof. Dr. Asya Toskova has presented participation in 6 research projects - 1 international, 2 national programs, 1 to the Ministry of Education and Science and 2 to the Research Fund of PU. The main results of Dr. Asya Toskova's scientific work were achieved during her partisipation on these projects. It is also important to note the participation of the candidate with presentations at various international and national forums - 19 in number.

I have examined the h-indexes of Dr. Asya Toskova in her profiles in the world scientific databases SCOPUS and Web of Science (WoS) - SCOPUS h-index = 3 and WoS h-index = 0. The scientific metrics indicate that the candidate should focus her publication activity on highly reputable journals and those with impact factor.

In the current competition, **Chief Asst. Prof. Dr. Veneta Tabakova-Komsalova** participates with a total of 48 scientific papers beyond those with which she has earned the educational and scientific degree "Doctor" and the academic position " Chief Assistant Professor". She has published 25 scientific works abroad. Of these, 1 publication with impact factor is "Integration of STEM Centers in a Virtual Education Space", Mathematics 10, no.5:744, which is co-authored. There is one solo monograph in Bulgarian, published by the Plovdiv University Press "P. Hilendarski" and one monograph also in Bulgarian, co-authored, published by the publishing house "Prof. Marin Drinov", Bulgarian Academy of Sciences. There are 28 scientific works published in foreign languages (English). Dr. Veneta Tabakova-Komsalova has published a total of 25 scientific papers in 13 foreign and international journals - International Conference Automatics and Informatics - 5 scientific papers, International Conference on Intelligent Systems - 2 scientific papers, "E-learning" Katowice-Cieszyn - 2 scientific papers, The Educational Review - 1 scientific paper, MDPI - 1 scientific paper, IJET - 1 scientific paper, Open Research Europe - 1 scientific paper, Electronic Learning: Digital Technologies in Education - 4 research papers, BdKCSE - 3 research papers, IFAC - 1 research paper, Springer Cham. - 1 research paper, DiPP - 1 research paper, FACILITATE - AI - 2 research papers, and has published 23 research papers in 10 Bulgarian editions. Two of Dr. Veneta Tabakova's scientific papers are solo papers - these are papers with the numbers [3.2

and 3.3] from the list of scientific papers for the competition, the remaining 46 are co-authored. The 48 scientific papers submitted for the competition are in the field of the competition, and 19 of them are refereed in the SCOPUS and/or Web of Science databases. Chief asst. Dr. Veneta Tabakova-Komsalova has submitted a list of 6 peer-reviewed scientific papers in international journals published by MDPI (Sustainability, Agriculture).

In the report on the minimum national requirements according to the Regulations for the Implementation of the Law on the Development of the Academic Staff of the Republic of Bulgaria, Dr. Veneta Tabakova-Komsalova has scored in the group of indicators A - 50 points, group of indicators B - 200 points, group of indicators G - 497 points, group of indicators D - 216 points and group of indicators E - 77 points. Total 1040 points with a minimum requirement of 400 points. I find no inconsistencies after examination of the national minimum requirements document.

Contributions. The scientific contributions of Dr. V. Tabakova-Komsalova I can define as scientific, scientific applied and applied. They can be summarized in three directions:

- **Artificial intelligence systems**. One of the monographs submitted to the competition, Artificial Intelligence in 24..../ book1" [3.1], is related to this area, and the authors discuss four major classes of search methods, an introduction to classical logic, logic programming, and expert systems. The monograph is published by the BAS publishing house "Prof. Marin Drinov", in the volume of 287 pages and is co-authored (three authors). A separation protocol is presented, where it is recorded that Dr. V. Tabakova-Komsalova has 40% participation - it is not noted which chapters were developed by which author. The solo monograph of Dr. Tabakova-Komsalova "Knowledge Representation in Artificial Intelligence Systems" [3.3] in the volume of 149 pages, published by the Plovdiv University Press "P. Hilendarski". The monograph describes the main forms of knowledge representation (rules, frames and semantic networks) and the corresponding inference engines. It shows the architecture of a knowledge-based system, such as expert systems, and discusses various examples of developing such systems. The logic programming language Prolog and tools based on Knowledge Specification Language (KSL) are used as development tools. This group of contributions also includes various knowledge-based applications in different domains, such as learning [1.14], knowledge evaluation [2.1], CPSS learning environments [2.2], and Bulgarian folklore [2.24].

- **Introducing artificial intelligence in secondary school**. In this group of results belongs the book on the dissertation of Dr. Veneta Tabakova [3.2]. In addition to the development of algorithmic thinking, attention is paid to declarative thinking, which is important for the introduction of artificial intelligence in school. This includes publications [1.1; 1.2; 1.3; 1.9; 1.10; 2.3; 2.6; 2.7; 2.28] that present results of introducing artificial intelligence in secondary school. The main results are related to the introduction of courses in secondary school to learn Prolog and logic programming. This initiative of Dr. Veneta Tabakova-Komsalova was also inspired by her participation in an initiative celebrating 50 years of the Prolog language, known as "Prolog Education and Thinking", which was organized by one of the creators of the language, Prof. Robert Kowalski.

  The results of the introduction of artificial intelligence education using the Prolog logic programming language in school education in Bulgaria are presented in [1.1, 1.2, 1.4, 1.7, 1.8, 1.15, 1.23, 2.3, 2.8, 2.13, 2.14, 2.25]. One form of introducing artificial intelligence is through school-based STEM centers [1.6, 1.13]. For this purpose, the candidate has developed a curriculum presented in papers [1.11] and [2.12]. Curricula for teaching artificial intelligence to students in grades 7-12, developed under an international project, are presented in [2.29, 2.30].

- **Application of artificial intelligence in smart agriculture**. This area of Dr. Tabakova-Komsalova's contributions includes results in the field of smart agriculture. A platform for intelligent agriculture ZEMELA [1.5, 2.4, 2.15, 2.18, 2.19] has been developed. Developments of the individual components of its architecture (operational assistants, event model, knowledge base) and its extensions are presented [2.10, 2.11, 2.16, 2.15, 2.17, 2.21, 2.22]. In [1.5; 2.5; 2.9; 2.26] the development of an expert system for livestock poisoning diagnosis is presented. In [2.20], a DEVS-based irrigation system model is developed. A study on how ZEMELA can use large language models (LLM) has been done [2.27].

Citations. Chief As. Prof. Dr. Veneta Tabakova-Komsalova has presented a list with 53 citations. I should note that in the document for additional faculty requirements, the candidate has noted that she participated with 48 citations. After reviewing the list of noted citations, I found that the total number of citations is 53. There are 27 citations in SCOPUS and/or WoS, 26 citations outside of these databases, and 37 citations by Bulgarian authors. This shows that the candidate's scientific work is accepted with confidence by the scientific community.

Other indicators on the candidate's overall scientific activity.

Chief As. Prof. Dr. Veneta Tabakova-Komsalova has presented participation in 8 research projects - 1 international, 3 to the Research Fund of PU, 2 to National Programmes, 2 to the Ministry of Education and Science (one of which she is the leader). The main results of Dr Veneta Tabakova-Komsalova's scientific work have been achieved during her participation in these projects, which is described in the self-evaluation document and in the publications included in the competition. It is important to note the participation of the candidate with presentations at various international and national forums - 18 in number.

I have examined the h-indexes of Dr Veneta Tabakova-Komsalova in her profiles in the world scientific databases SCOPUS and Web of Science - SCOPUS h-index = 4 and WoS h-index = 1. The scientific metrics indicate that the candidate should focus her publication activity on reputable journals and those with impact factor.

Table 1. Criteria minimum national requirements, additional requirements of FMI of PU "P. Hilendarski" (presented according to the candidates and according to the review) and additional indicators.

Minimum national requirements		**Dr. Asya Toskova**		**Dr. Veneta Tabakova-Komsalova**	
Indicator	**minimum points**	**according to the candidate**	**correction**	**according to the candidate**	**correction**
Group A	**50**	**50**	**-**	**50**	**-**
Group B	**100**	**100**	**-**	**200**	**-**
Group G	**200**	**345**	**345-48 =297**	**497**	**-**
Group D	**50**	**212**	**-**	**216**	**-**
Group E	**-**	**70**	**70-20 =50**	**77**	**-**
Total points	**400**	**777**	**709**	**1040**	**-**
Faculty requirements		**Dr. Asya Toskova**		**Dr. Veneta Tabakova-Komsalova**	
Indicator	**minimum criteria**	**according to the can-didate**	**correction**	**according to the can-didate**	**correction**
Publications	**10 бр**	**28**	**21 - two equated**	**48**	**-**
Publications in journals, book chapters and books	**5 бр.**	**7**	**-**	**16**	**-**
Citation	**5 бр**	**53**	**-**	**48**	**53**
Teaching materials	**1 бр**	**1**	**0**	**1**	**-**

Other indicators on the candidate's overall scientific activity		
Monographs	**1**	**2**
Publications with IF	**1 бр., IF = 0,343, Q3**	**1 бр., IF = 2,4, Q1**
Publications in SCOPUS and/or WoS	**13**	**19**
Citations in SCOPUS and/or WoS	**27**	**27**
Foreign and international editions	**14 of 21**	**25 of 48**
Bulgarian editions	**8 of 21**	**23 of 48**
In English language	**15 of 21**	**28 of 48**
In Bulgarian language	**6 of 21**	**20 of 48**
Solo scientific works	**3 of 21**	**2 of 48**
Conference Proceedings	**14 of 21**	**30 of 48**
Books/Book chapters	**1**	**3**
Articles in series and journals	**5**	**13**
Presentations at international/national forums	**19**	**18**
Participation in projects	**6**	**8**
h-index in SCOPUS	**3 (14 publications)**	**4 (17 publications)**
h-index in Web of Science	**0 – (2 publications)**	**1 – (8 publications)**

4. Evaluation of candidates' personal contribution

Developments in informatics often require team work. Candidates have presented few solo research papers - Dr. Asya Toskova - 3 out of 21 research papers, and Dr. Veneta Tabakova-Komsalova - 2 out of 48 research papers. Many of the candidates' results were achieved during their participation in national, international and university projects, which certainly requires team work. From the submitted documents, it is established that the candidates have made a high personal contribution to research and teaching. At the same time, it is difficult to personalise this contribution in all publications. For this purpose, the candidates also prepared the self-assessment of contributions report for the materials submitted for the competition. I should note that Dr. Asya Toskova has not made a self-assessment of all her materials submitted for the competition (11 out of 21 of the submitted research papers are not cited in the reference), which further complicates the reviewer's task of determining the candidate's personal contribution.

5. Critical comments and recommendations

Most of the comments I have for the candidates are noted in reviewing the candidates' activities. There are some errors in the attached documents which I have noted in my examination.

As a recommendation to both candidates is to focus their publication activity on journals with impact factor and those refereed and indexed in world known scientific databases. A recommendation can also be made to both candidates for more solo papers.

CONCLUSION

The documents and materials submitted by the two candidates meet all the requirements of the Academic Staff Development Act in the Republic of Bulgaria (ASDA), the Regulations for the Implementation of the ASDA and the relevant Regulations of “Paisii Hilendarski” University of Plovdiv and the additional faculty requirements of the Faculty of Mathematics and Informatics for the acquisition of the academic position of “Associate Professor”.

Chief As. Prof. Dr. Asya Toskova has presented a sufficient number of scientific works after the materials submitted in the defense of the PhD and the academic position " Chief Assistant Professor". Her work has original scientific- applied and applied contributions in the field of machine learning. She satisfies the minimum national and additional requirements of the Faculty of Mathematics and Informatics (by exceeding them significantly), but it should be noted that the scores evaluating the research papers in the minimum national requirements (according to the) are 30% less than those of the other candidate (Table 1). There is a discrepancy in the field of the competition in the teaching activity of Dr. Asya Toskova, where the attached textbook does not correspond to the subject of the competition and her teaching activity in mandatory courses is in the field of "Software Technology". She teaches two elective courses which are in the area of machine learning and cognitive robotics. It should be taken into account that the curricula in the mandatory courses in artificial intelligence in the Department of Computer Systems are in the direction of classical artificial intelligence (search methods, knowledge representation), and machine learning and robotics are specializations in the subject in the form of elective courses. As. Dr. Asya Toskova has defended 1 diploma student during her work as Assistant Professor and Chief Assistant Professor (from 2015-present) in the Department of Computer Systems. The scientific work and the contributions presented by Dr. Asya Toskova are provided in the document for the self-assessment of the contributions on the attached materials, where she has included only 10 of the 21 scientific papers submitted for the competition. The reviewer could not determine the personal contribution of Dr. Asya Toskova in the contributions of the remaining 11 attached scientific works, except in article [18], which is solo. The scient metric data in the global databases SCOPUS and WOS of Dr. Asya Toskova show that there are only few publications in reputable

journals and those with impact factor. The total impact factor of Dr. Asya Toskova in her scientific works is IF = 0.343.

The candidate in the competition prof. asst. Dr. Veneta Tabakova-Komsalova has presented a sufficient number of scientific works published after the materials used in the defense of the PhD and the academic position of " Chief Assistant Professor". In the candidate's works there are original scientific, applied scientific and applied contributions in the field of artificial intelligence systems (methods of knowledge search and representation), artificial intelligence training and application of artificial intelligence in smart agriculture. The presented works have practical applicability, some of them are directly oriented to educational work. Dr. Veneta Tabakova-Komsalova has defended 3 diploma students during her work in the Department of Computer Systems (since 2020). The results achieved by Dr Veneta Tabakova-Komsalova in the research activities significantly exceed the additional requirements of the FMI accepted in connection with the Regulations of the PU for the implementation of the ASDA and the minimum national requirements in the ASDA RB (Table 1). The candidate's research and teaching results are fully relevant to the subject of the competition (Artificial Intelligence) and are in a wide range of fields in this area. The overall impact factor of the candidate's research papers is IF = 2.4. Dr. Veneta Tabakova-Komsalova's teaching and pedagogical activity is in the field of the competition and her research works related to the introduction of Artificial Intelligence in secondary school, where the results are discussed in international projects and with world-known scientists, undoubtedly contribute to the results in her teaching work.

After reading the materials and scientific works presented in the competition, analyzing their significance and the scientific, scientific applied and scientific contributions contained in them, I find it reasonable to give my **positive assessment** and to recommend the Scientific Jury to prepare a report-proposal to the Faculty Council of the Faculty of Mathematics and Informatics for the election of the Chief Assistant Professor Dr. Veneta Tabakova-Komsalova to the academic position of **Associate Professor** at the University of Plovdiv “Paisii Hilendarski” in the field of higher education 4. Professional field 4.6. Informatics and Computer Science (Artificial Intelligence).

03.03.2024 **Reviewer: .....**

Plovdiv Prof. Asya Stoyanova-Doycheva, PhD