Ministry of Agriculture of the Russian Federation
Federal State Budgetary Educational Institution
higher education
"St. Petersburg State University of Veterinary Medicine"

APPROVED BY
Vice-Rector
for educational work
and youth policy
Professor
_____ A.A. Sukhinin
June 27, 2025

Department of Inorganic Chemistry and Biophysics

WORKING PROGRAMM

by discipline

"COMPUTER SCIENCE AND DIGITAL TECHNOLOGIES"

Level of higher education

SPECIALTY

Specialty 36.05.01 Veterinary Medicine

Profile: General clinical veterinary medicine

Full-time education

Education starts in 2025

Reviewed and accepted
at a department meeting
on June 19, 2025
Protocol No. 18-06-24/25

Head department
Inorganic chemistry and biophysics
Candidate of Chemical Sciences, Associate Professor
_____ A.N. Baryshev

Saint Petersburg
2025

1. GOALS AND OBJECTIVES OF DISCIPLINE

Due to the increasing role of computer science in modern conditions, the introduction of computers into all sectors of the national economy, including the medical sector, is constantly increasing. A modern specialist of any profile must confidently communicate with computer technology, since the accumulation and processing of experimental statistical data is universally carried out using computers.

The purpose of studying the discipline is to study the general theoretical foundations of mathematical biostatistics, as well as the theoretical foundations of computer science as a science, study the composition and functioning of modern computers, obtain computer skills for their effective use in professional activities, as well as for continuous, independent improvement of the level of qualifications based on modern educational and other information technologies.

To achieve this goal, it is necessary to solve the following tasks:

a) The general educational task is in-depth familiarize students with the basics of mathematical biostatistics and information technology, with the basics of statistical methods for presenting, grouping and processing materials (results) of biological research.

b) The applied task covers issues related to the use of modern application software packages at the level of a qualified user.

c) The special task is to acquire practical skills in statistical research methods in biology, calculation of the most important statistical indicators and patterns characterizing sets of biological objects for their effective use in professional activities.

2. LIST OF PLANNED MASTERING RESULTS BY DISCIPLINE (MODULE), CORRELATED WITH THE PLANNED RESULTS OF MASTERING THE EDUCATIONAL PROGRAM

As a result of mastering the discipline, the student prepares for the following types of activities, in accordance with the educational standard of Federal State Educational Standard of Higher Education 36.05.01 “Veterinary Medicine”.

Area of professional activity:

13 Agriculture

Types of professional activity tasks:

- Medical;
- Expert control;
- Scientific and educational.

Student competencies formed as a result of mastering the discipline

Studying the discipline should form the following competencies:

A) Universal Competencies (UC):

UC-1 Able to critically analyze problem situations based on a systematic approach and develop an action strategy:

UC-1ID-1 Know the methods of critical analysis and evaluation of modern scientific achievements; basic principles of critical analysis;

UC-1ID-2 Be able to obtain new knowledge based on analysis, synthesis, etc.; collect and summarize data on current scientific issues related to the professional field; search for information and solutions based on actions, experiment, experience, information and communication technologies;

UC-1ID-3 Be able to study the problem of professional activity using analysis, synthesis and other methods of intellectual activity, including the use of information and communication

technologies; identifying problems and using adequate methods to solve them; demonstrating value judgments in solving problematic professional situations.

UC-4 Able to use modern communication technologies, including in foreign language(s), for academic and professional interaction:

UC-4ID-1 Know computer and information and communication technologies, information and digital infrastructure in the organization; communication in professional ethics; factors for improving communication in an organization, communication technologies in professional interaction; characteristics of communication flows; the importance of communication in professional interaction; methods for studying the communicative potential of an individual; modern means of information and communication technologies;

UC-4ID-2 Be able to create written texts in Russian and foreign languages in scientific and official business styles of speech on professional issues; explore the flow of information through management communications; determine internal communications in the organization, including using digital technologies;

UC-4ID-3 Know the principles of forming a communication system; analyze the system of communication links in the organization by implementing oral and written communications, including in a foreign language; presenting plans and results of one's own and team activities using communication technologies; technology for building effective communication in an organization; transfer of professional information in information and telecommunication networks using modern means of information and communication technologies.

B) General professional competencies (GPC):

GPC-5 Able to draw up special documentation, analyze the results of professional activities and submit reporting documents using specialized databases:

GPC-5_{ID-1}Be able to use new information technologies to solve assigned problems in your professional activities, work with specialized information databases;

GPC-5_{ID-2}Possess skills in working with an operating system, with text and spreadsheet processors, with database management systems, with information retrieval systems on the Internet;

GPC-5_{ID-3}Know new information technologies to solve problems in your professional activities, work with specialized information databases.

GPC-7 Able to understand the operating principles of modern information technologies and use them to solve professional problems:

GPC-7_{ID-1}Know modern technical means and information technologies;

GPC-7_{ID-2}Be able to use modern technical tools and information technologies, including elements of machine learning and artificial intelligence, to solve analytical and research problems;

GPC-7_{ID-3} Possess the skills to use modern technical means and information technologies to solve analytical and research problems.

C) Professional competencies (PC):

PC-19 Is able to organize monitoring studies using big data processing systems and artificial intelligence in professional activities.

PC-19_{ID-1} To know the software packages for automatic management of veterinary documentation.

PC-19_{ID-2} To have the skills to work with large amounts of veterinary documentation.

PC-19_{ID-3} To possess knowledge in the field of artificial intelligence and data analysis.

3. THE PLACE OF DISCIPLINE IN THE STRUCTURE OF THE MPEP

Discipline B.1.O.12 “Informatics and digital technologies” is a mandatory discipline of the federal state educational standard of higher education in specialty 36.05.01 “Veterinary Medicine” (specialty level).

Mastered: 1 semester (full-time study)

When teaching the discipline “Computer science and digital technologies”, knowledge and skills are used, received by students while mastering a school course in mathematics and computer science in accordance with the state standard of general education.

Discipline " Computer science and digital technologies" is the discipline on which subsequent disciplines are built, such as:

1. Biological physics.
2. Economy.
3. Methods of scientific research.

4. THE SCOPE OF DISCIPLINE AND TYPES OF ACADEMIC WORK

4.1. Scope of the discipline “ Computer science and digital technologies” for full-time study

Type of educational work	**Total hours**	**Semester**
		1
Classroom lessons (total)	**54**	**54**
Including:		
Lectures, including interactive forms	18	18
Practical lessons (PL), including interactive forms, including:	36	36
practical training (PT)	6	6
Independent work (total)	**54**	**54**
Type of intermediate certification (test/exam)	**Test**	**Test**
Total labor intensityhours/credits	**108/3**	**108/3**

5. CONTENT OF DISCIPLINE"INFORMATICS AND DIGITAL TECHNOLOGIES"

5.1. Contents of the discipline “Informatics and Digital Technologies” for full-time study

№	Name	Formed competencies	Semester	Types of educational work, including independent work of students and labor intensity (in hours)			
				L	PL	PT	IW
1.	Basic concepts of probability theory	**UC-1**Able to critically analyze problem situations based on a systematic approach and develop an action strategy: UC-1ID-1 Know the methods of critical analysis and evaluation of modern scientific achievements; basic principles of critical analysis; UC-1ID-2 Be able to obtain new knowledge based on analysis, synthesis, etc.; collect and summarize data on current scientific issues related to the professional field; search for information and solutions based on actions, experiment, experience, information and communication technologies; UC-1ID-3 Be able to study the problem of professional activity using analysis, synthesis and other methods of intellectual activity, including the use of information and communication technologies; identifying problems and using adequate methods to solve them; demonstrating value judgments in solving problematic professional situations.	1	2	2	2	4
2.	Random variables	**UC-1**Able to critically analyze problem situations based on a systematic approach and develop an action strategy: UC-1ID-1 Know the methods of critical analysis and evaluation of modern scientific achievements; basic principles of critical analysis; UC-1ID-2 Be able to obtain new knowledge based on analysis, synthesis, etc.; collect and summarize data on current scientific issues related to the professional field; search for information and solutions based on actions, experiment, experience, information and communication technologies; UC-1ID-3 Be able to study the problem of professional activity using analysis, synthesis and other methods of intellectual activity, including the use of information and communication technologies; identifying problems and using adequate methods to solve them; demonstrating value judgments in solving problematic professional situations.	1	2	2	2	4
3.	Math statistics. Descriptive methods of data analysis	**UC-1**Able to critically analyze problem situations based on a systematic approach and develop an action strategy: UC-1ID-1 Know the methods of critical analysis and evaluation of modern scientific achievements; basic principles of critical analysis; UC-1ID-2 Be able to obtain new knowledge based on analysis, synthesis, etc.; collect and summarize data on current scientific issues related to the professional field; search for information and solutions based on actions, experiment, experience, information and communication technologies;	1	2	2	-	6

		UC-1ID-3 Be able to study the problem of professional activity using analysis, synthesis and other methods of intellectual activity, including the use of information and communication technologies; identifying problems and using adequate methods to solve them; demonstrating value judgments in solving problematic professional situations.					
4.	Statistical evaluation	**UC-1**Able to critically analyze problem situations based on a systematic approach and develop an action strategy: UC-1ID-1 Know the methods of critical analysis and evaluation of modern scientific achievements; basic principles of critical analysis; UC-1ID-2 Be able to obtain new knowledge based on analysis, synthesis, etc.; collect and summarize data on current scientific issues related to the professional field; search for information and solutions based on actions, experiment, experience, information and communication technologies; UC-1ID-3 Be able to study the problem of professional activity using analysis, synthesis and other methods of intellectual activity, including the use of information and communication technologies; identifying problems and using adequate methods to solve them; demonstrating value judgments in solving problematic professional situations.	1	2	-	2	4
5.	Statistical hypothesis testing	**UC-1**Able to critically analyze problem situations based on a systematic approach and develop an action strategy: UC-1ID-1 Know the methods of critical analysis and evaluation of modern scientific achievements; basic principles of critical analysis; UC-1ID-2 Be able to obtain new knowledge based on analysis, synthesis, etc.; collect and summarize data on current scientific issues related to the professional field; search for information and solutions based on actions, experiment, experience, information and communication technologies; UC-1ID-3 Be able to study the problem of professional activity using analysis, synthesis and other methods of intellectual activity, including the use of information and communication technologies; identifying problems and using adequate methods to solve them; demonstrating value judgments in solving problematic professional situations.	1	2	2	-	4
6.	Basic concepts and methods of computer science and coding theory	**GPC-5**Able to draw up special documentation, analyze the results of professional activities and submit reporting documents using specialized databases: GPC-5_{ID-1}Be able to use new information technologies to solve assigned problems in your professional activities, work with specialized information databases; GPC-5_{ID-2}Possess skills in working with an operating system, with text and spreadsheet processors, with database management systems, with information retrieval systems on the Internet; GPC-5_{ID-3}Know new information technologies to solve problems in your professional activities, work with specialized information databases.	1	2	2	-	4
7.	Technical means for implementing information processes	GPC-**5**Able to draw up special documentation, analyze the results of professional activities and submit reporting documents using specialized databases: GPC-5_{ID-1}Be able to use new information technologies to solve assigned problems in your professional activities, work with specialized information databases; GPC-5_{ID-2}Possess skills in working with an operating system, with text and spreadsheet processors, with database management systems, with information retrieval systems on the Internet;	1	2	-	-	4

		GPC-5_{ID-3}Know new information technologies to solve problems in your professional activities, work with specialized information databases.					
8.	PC software	**GPC-5**Able to draw up special documentation, analyze the results of professional activities and submit reporting documents using specialized databases: GPC-5_{ID-1}Be able to use new information technologies to solve assigned problems in your professional activities, work with specialized information databases; GPC-5_{ID-2}Possess skills in working with an operating system, with text and spreadsheet processors, with database management systems, with information retrieval systems on the Internet; GPC-5_{ID-3}Know new information technologies to solve problems in your professional activities, work with specialized information databases.	1	2	-	-	2
9.	Operating systems (OS)	**GPC-5**Able to draw up special documentation, analyze the results of professional activities and submit reporting documents using specialized databases: GPC-5_{ID-1}Be able to use new information technologies to solve assigned problems in your professional activities, work with specialized information databases; GPC-5_{ID-2}Possess skills in working with an operating system, with text and spreadsheet processors, with database management systems, with information retrieval systems on the Internet; GPC-5_{ID-3}Know new information technologies to solve problems in your professional activities, work with specialized information databases.	1	2	-	-	2
10.	Standard Windows applications	**UC-4** Able to use modern communication technologies, including in foreign language(s), for academic and professional interaction: UC-4ID-1 Know computer and information and communication technologies, information and digital infrastructure in the organization; communication in professional ethics; factors for improving communication in an organization, communication technologies in professional interaction; characteristics of communication flows; the importance of communication in professional interaction; methods for studying the communicative potential of an individual; modern means of information and communication technologies; UC-4ID-2 Be able to create written texts in Russian and foreign languages in scientific and official business styles of speech on professional issues; explore the flow of information through management communications; determine internal communications in the organization, including using digital technologies; UC-4ID-3 Know the principles of forming a communication system; analyze the system of communication links in the organization by implementing oral and written communications, including in a foreign language; presenting plans and results of one's own and team activities using communication technologies; technology for building effective communication in an organization; transfer of professional information in information and telecommunication networks using modern means of information and communication technologies. **GPC-7**Able to understand the operating principles of modern information technologies and use them to solve professional problems: GPC-7_{ID-1}Know modern technical means and information technologies; GPC-7_{ID-2}Be able to use modern technical tools and information technologies, including elements of machine learning and artificial intelligence, to solve analytical and research problems;	1	-	2	-	2

		GPC-7_{ID-3} Possess the skills to use modern technical means and information technologies to solve analytical and research problems.					
11.	Word processor Microsoft Word	**UC-4** Able to use modern communication technologies, including in foreign language(s), for academic and professional interaction: UC-4ID-1 Know computer and information and communication technologies, information and digital infrastructure in the organization; communication in professional ethics; factors for improving communication in an organization, communication technologies in professional interaction; characteristics of communication flows; the importance of communication in professional interaction; methods for studying the communicative potential of an individual; modern means of information and communication technologies; UC-4ID-2 Be able to create written texts in Russian and foreign languages in scientific and official business styles of speech on professional issues; explore the flow of information through management communications; determine internal communications in the organization, including using digital technologies; UC-4ID-3 Know the principles of forming a communication system; analyze the system of communication links in the organization by implementing oral and written communications, including in a foreign language; presenting plans and results of one's own and team activities using communication technologies; technology for building effective communication in an organization; transfer of professional information in information and telecommunication networks using modern means of information and communication technologies. **GPC-7**Able to understand the operating principles of modern information technologies and use them to solve professional problems: GPC-7_{ID-1}Know modern technical means and information technologies; GPC-7_{ID-2}Be able to use modern technical tools and information technologies, including elements of machine learning and artificial intelligence, to solve analytical and research problems; GPC-7_{ID-3} Possess the skills to use modern technical means and information technologies to solve analytical and research problems.	1	-	4	-	4
12.	Microsoft Excel 2007 Spreadsheets	**UC-4** Able to use modern communication technologies, including in foreign language(s), for academic and professional interaction: UC-4ID-1 Know computer and information and communication technologies, information and digital infrastructure in the organization; communication in professional ethics; factors for improving communication in an organization, communication technologies in professional interaction; characteristics of communication flows; the importance of communication in professional interaction; methods for studying the communicative potential of an individual; modern means of information and communication technologies; UC-4ID-2 Be able to create written texts in Russian and foreign languages in scientific and official business styles of speech on professional issues; explore the flow of information	1	-	6	-	6

		through management communications; determine internal communications in the organization, including using digital technologies; UC-4ID-3 Know the principles of forming a communication system; analyze the system of communication links in the organization by implementing oral and written communications, including in a foreign language; presenting plans and results of one's own and team activities using communication technologies; technology for building effective communication in an organization; transfer of professional information in information and telecommunication networks using modern means of information and communication technologies. **GPC-7**Able to understand the operating principles of modern information technologies and use them to solve professional problems: GPC-7_{ID-1}Know modern technical means and information technologies; GPC-7_{ID-2}Be able to use modern technical tools and information technologies, including elements of machine learning and artificial intelligence, to solve analytical and research problems; GPC-7_{ID-3} Possess the skills to use modern technical means and information technologies to solve analytical and research problems.					
13.	Database management system (DBMS) Microsoft Access	**UC-4** Able to use modern communication technologies, including in foreign language(s), for academic and professional interaction: UC-4ID-1 Know computer and information and communication technologies, information and digital infrastructure in the organization; communication in professional ethics; factors for improving communication in an organization, communication technologies in professional interaction; characteristics of communication flows; the importance of communication in professional interaction; methods for studying the communicative potential of an individual; modern means of information and communication technologies; UC-4ID-2 Be able to create written texts in Russian and foreign languages in scientific and official business styles of speech on professional issues; explore the flow of information through management communications; determine internal communications in the organization, including using digital technologies; UC-4ID-3 Know the principles of forming a communication system; analyze the system of communication links in the organization by implementing oral and written communications, including in a foreign language; presenting plans and results of one's own and team activities using communication technologies; technology for building effective communication in an organization; transfer of professional information in information and telecommunication networks using modern means of information and communication technologies. **GPC-7**Able to understand the operating principles of modern information technologies and use them to solve professional problems: GPC-7_{ID-1}Know modern technical means and information technologies;	1	-	4	-	4

		GPC-7_{ID-2}Be able to use modern technical tools and information technologies, including elements of machine learning and artificial intelligence, to solve analytical and research problems; GPC-7_{ID-3} Possess the skills to use modern technical means and information technologies to solve analytical and research problems.					
14.	Microsoft Power Point Presentation Tools	**UC-4** Able to use modern communication technologies, including in foreign language(s), for academic and professional interaction: UC-4ID-1 Know computer and information and communication technologies, information and digital infrastructure in the organization; communication in professional ethics; factors for improving communication in an organization, communication technologies in professional interaction; characteristics of communication flows; the importance of communication in professional interaction; methods for studying the communicative potential of an individual; modern means of information and communication technologies; UC-4ID-2 Be able to create written texts in Russian and foreign languages in scientific and official business styles of speech on professional issues; explore the flow of information through management communications; determine internal communications in the organization, including using digital technologies; UC-4ID-3 Know the principles of forming a communication system; analyze the system of communication links in the organization by implementing oral and written communications, including in a foreign language; presenting plans and results of one's own and team activities using communication technologies; technology for building effective communication in an organization; transfer of professional information in information and telecommunication networks using modern means of information and communication technologies. **GPC-7**Able to understand the operating principles of modern information technologies and use them to solve professional problems: GPC-7_{ID-1}Know modern technical means and information technologies; GPC-7_{ID-2}Be able to use modern technical tools and information technologies, including elements of machine learning and artificial intelligence, to solve analytical and research problems; GPC-7_{ID-3} Possess the skills to use modern technical means and information technologies to solve analytical and research problems. **PC-19** Is able to organize monitoring studies using big data processing systems and artificial intelligence in professional activities. PC-19_{ID-1} To know the software packages for automatic management of veterinary documentation. PC-19_{ID-2} To have the skills to work with large amounts of veterinary documentation.	1	-	4	-	4

		PC-19$_{ID-3}$ To possess knowledge in the field of artificial intelligence and data analysis.					
TOTAL FOR 1 SEMESTER				**18**	**30**	**6**	**54**

6. LIST OF EDUCATIONAL AND METHODOLOGICAL SUPPORT FOR INDEPENDENT WORK OF STUDENTS

6.1.Guidelines for independent work

1. Educational and methodological manual on the organization of independent work of students in the areas of training implemented in St. Petersburg State Academy of Mechanics and Mathematics [Electronic resource] / A.A. Sukhinin [and others]; SPbGAVM - SPb.: Publishing house SPbGAVM, 2018. - 67 p. - Access mode:https://ebs.spbgavm.ru/MarcWeb2/Default.asp(date of access: 04/27/2024)
2. Practical guide to laboratory work in computer science. Text editor Writer Open Office. Part 1 / SPbGAVM; comp.: M.K. Igolinskaya, E.A. Belov. - St. Petersburg: Publishing house of SPbGAVM, 2008. - 54 p.
3. EXCEL spreadsheets: a practical guide to laboratory work in computer science for first-year students of all faculties, for students of the correspondence faculty, for graduate students of veterinary specialties. Part 2 / comp.: M. K. Igolinskaya, E. M. Smirnova, N. A. Lebedinskaya; SPbGAVM. - St. Petersburg: Publishing House SPbGAVM, 2016. - 76 p. - URL: Igolinskaya, Smirnova, Lebedinskaya.EXL_16 - (give appeal: 04/27/2024).
4. Igolinskaya M.K. Basics of working with the Access 2007 database management system. Methodological manual for laboratory work in computer science / Igolinskaya M.K. – SPb: SPbGAVM, 2013. – 60 p.

6.2.Literature for independent work

1. Short course on probability theory and mathematical statistics: educational and methodological manual for higher mathematics / comp. M. K. Igolinskaya, N. A. Lebedinskaya, T. Sh. Kuznetsova; SPbGAVM. - St. Petersburg: Publishing house SPbGAVM, 2016. - 61 p.
2. V. E. Probability theory and mathematical statistics: textbook for universities / V. E. Gmurman. — 12th ed. - Moscow: Yurayt Publishing House, 2021. - 479 p. - (Higher education). — ISBN 978-5-534-00211-9. — Text: electronic // Educational platform Urayt [site]. — URL: https://urait.ru/bcode/468331 (date of access: 04/27/2024).

7. LIST OF BASIC AND ADDITIONAL LITERATURE REQUIRED FOR MASTERING THE DISCIPLINE

a) basic literature:

1. Short course on probability theory and mathematical statistics: textbook. -method. higher education allowance mat. for independent work of students and graduate students of SPbGAVM / comp. M. K. Igolinskaya, E. M. Smirnova; SPbGAVM. – St. Petersburg: Publishing house SPbGAVM, 2017. – 65 p. – Text: electronic. – URL:https://clck.ru/VYoUh(date of access: 04/27/2024). – Access mode: for authorization. users of the SPbSUVM EB.
2. Short course on probability theory and mathematical statistics: educational method. higher education allowance mat. for independent work of students and postgraduate students of St. Petersburg State Academy of Mechanics and Mathematics / comp.: M. K. Igolinskaya, N. A. Lebedinskaya. T. Sh. Kuznetsova; SPbGAVM. – St. Petersburg: Publishing house SPbGAVM, 2016. – 61 p. – Text: electronic. – URL:https://clck.ru/VYocu(date of access: 04/27/2024). – Access mode: for authorization. users of the SPbSUVM EB.
3. Mathematical statistics in Excel: practical. hands to the lab. work on stat. with use electron. table Excel for 1st year students of all faculties, for part-time students. Faculty, for graduate students of veterinary science. specialist. / comp. M. G. Igolinskaya, E. M. Smirnova; SPbGAVM. – St. Petersburg: SPbGAVM, 2017. – 24 p. – Text: electronic. – URL:https://clck.ru/VYotu(date of access: 04/27/2024). – Access mode: for authorization. users of the SPbSUVM EB.
6. Text editor MS WORD 2007: educational method. information manual for 1st year students of all faculties, for part-time students. departments and for asp. vet. specialist. / comp. M. K. Igolinskaya, N. A. Lebedinskaya, E. M. Smirnova; SPbGAVM. – St. Petersburg: Publishing house

SPbGAVM, 2016. – 67 p. – Text: electronic. – URL:https://clck.ru/VYpkk(date of access: 04/27/2024). – Access mode: for authorization. users of the SPbSUVM EB.

b) additional literature:

1. Mathematical statistics in biology: educational and methodological manual for students studying in the field of study 03/35/08 - “Aquatic biological resources and aquaculture” / compiled by: E. M. Smirnova; Ministry of Agriculture of the Russian Federation, SPbGAVM. – St. Petersburg: Publishing house SPbGAVM, 2017. – 65 p. – Text: electronic. – URL:https://clck.ru/VYyDU(date of access: 04/27/2024). – Access mode: for authorization. users of the SPbSUVM EB.
2. Lebedev, V. I. Informatics: a course of lectures in English = Informatics: course of lectures in English : a textbook / V. I. Lebedev ; North Caucasus Federal University. Stavropol : North Caucasus Federal University (NCFU), 2015. 101 p. : ill. – Access mode: by subscription. – URL: https://biblioclub.ru/index.php?page=book&id=457402 (date of request: 19.06.2025). – Bibliogr. in the book – Text : electronic.

8. LIST OF RESOURCES OF THE INTERNET INFORMATION AND TELECOMMUNICATION NETWORK NECESSARY FOR MASTERING THE DISCIPLINE

To prepare for practical classes and perform independent work, students can use the following Internet resources:

Electronic library systems:

1. EBS "SPBGUVM"
2. EBS "Student Consultant"
3. Legal reference system "ConsultantPlus"
4. University information system "RUSSIA"
5. Full text database POLPRED.COM
6. Scientific electronic library ELIBRARY.RU
7. Russian Scientific Network
8. Electronic library system IQlib
9. Full-text interdisciplinary database for agricultural and environmental sciencesProQuest AGRICULTURAL AND ENVIRONMENTAL SCIENCE DATABASE
10. Electronic books from the publishing house "Prospekt Nauki"http://prospektnauki.ru/ebooks/
11. Collection “Agriculture. Veterinary" publishing house "Kvadro"http://www.iprbookshop.ru/586.html

9. METHODOLOGICAL INSTRUCTIONS FOR STUDENTS ON MASTERING THE DISCIPLINE

Methodological recommendations for students are a set of recommendations and explanations that allow the student to optimally organize the process of studying this discipline. The content of methodological recommendations, as a rule, may include:

Tips for planning and organizing the time needed to study the discipline. Description of the sequence of student actions, or “scenario for studying the discipline.”

The morning time is the most fruitful for educational work (from 8-14 o'clock), then the afternoon (from 16-19 o'clock) and the evening time (from 20-24 o'clock). The most difficult material is recommended to be studied at the beginning of each time interval after rest. After 1.5 hours of work, a break (10-15 minutes) is required; after 4 hours of work, the break should be 1

hour. Part of the scientific organization of labor is mastering the technique of mental work. Normally, a student should devote about 10 hours a day to studying (6 hours at the university, 4 hours at home).

Recommendations for working on lecture material

When preparing for a lecture, the student is recommended to:

1) review the recordings of the previous lecture and recall previously studied material in memory;

2) it is useful to review the upcoming material of the future lecture;

3) if independent study of individual fragments of the topic of the last lecture is assigned, then it must be completed without delay;

4) prepare yourself psychologically for the lecture.

This work includes two main stages: taking notes of lectures and subsequent work on lecture material.

Note-taking means drawing up notes, i.e. a brief written statement of the content of something (oral presentation - speech, lecture, report, etc. or a written source - document, article, book, etc.).

The method of work when taking notes on oral presentations differs significantly from the method of work when taking notes from written sources.

By taking notes from written sources, the student has the opportunity to repeatedly read the desired passage of text, reflect on it, highlight the main thoughts of the author, briefly formulate them, and then write them down. If necessary, he can also note his attitude to this point of view. While listening to a lecture, the student must put off most of the above-mentioned work for another time, trying to use every minute to record the lecture, and not to comprehend it - there is no time left for this. Therefore, when taking notes from a lecture, it is recommended to separate fields on each page for subsequent entries in addition to the notes.

After recording a lecture or taking notes, you should not leave work on the lecture material until you begin preparing for the test. It is necessary to do as early as possible the work that accompanies note-taking of written sources and which was not possible to do while recording the lecture - read your notes, deciphering individual abbreviations, analyze the text, establish logical connections between its elements, in some cases show them graphically, highlight main thoughts, note issues that require additional processing, in particular, teacher consultation.

When working on the text of a lecture, the student needs to pay special attention to the problematic questions posed by the teacher when giving the lecture, as well as to his assignments and recommendations.

For each lecture, practical lesson and laboratory work, the number, topic, list of issues covered, volume in hours and links to recommended literature are provided. For classes conducted in interactive forms, their organizational form must be indicated: computer simulation, business or role-playing game, analysis of a specific situation, etc.

Recommendations for preparing for practical classes

Practical (seminar) classes constitute an important part of students' professional training. The main goal of conducting practical (seminar) classes is to develop analytical, creative thinking in students by acquiring practical skills. Practical classes are also conducted with the aim of deepening and consolidating the knowledge gained at lectures and in the process of independent work on regulatory documents, educational and scientific literature. When preparing for a practical lesson for students, it is necessary to study or repeat theoretical material on a given topic.

When preparing for a practical lesson, the student is recommended to adhere to the following algorithm;

1) get acquainted with the plan of the upcoming lesson;

2) study the literature sources that were recommended and familiarize yourself with the introductory comments to the relevant sections.

Methodological instructions for practical (seminar) classes in the discipline, along with the work program and schedule of the educational process, refer to methodological documents that determine the level of organization and quality of the educational process.

The content of practical (seminar) classes is recorded in the working curriculum of the disciplines in the sections “List of topics for practical (seminar) classes.”

The most important component of any form of practical training is assignments. The basis of the assignment is an example, which is analyzed from the perspective of the theory developed in the lecture. As a rule, the main attention is paid to the formation of specific skills and abilities, which determines the content of students’ activities - problem solving, laboratory work, clarification of the categories and concepts of science, which are a prerequisite for correct thinking and speech.

Practical (seminar) classes perform the following tasks:

- stimulate regular study of recommended literature, as well as attentive attention to the lecture course;
- consolidate the knowledge gained in the process of lecture training and independent work on literature;
- expand the scope of professionally significant knowledge, skills and abilities;
- allow you to check the correctness of previously acquired knowledge;
- instill skills of independent thinking and oral presentation;
- promote free use of terminology;
- provide the teacher with the opportunity to systematically monitor the level of students’ independent work.

Methodological instructions for practical (seminar) classes in the discipline should be focused on modern business conditions, current regulatory documents, advanced technologies, on the latest achievements of science, technology and practice, on modern ideas about certain phenomena and the reality being studied.

Laboratory work constitutes an important part of students' professional training. They are aimed at experimental confirmation of theoretical principles and the formation of educational and professional practical skills.

Students' performance of laboratory work is aimed at:

- generalization, systematization, deepening, consolidation of acquired theoretical knowledge on specific topics of disciplines;
- formation of necessary professional skills and abilities;

The disciplines for which laboratory work is planned and their volumes are determined by the working curriculum.

Guidelines for conducting laboratory work are developed for the duration of the working curriculum and include:

- title, which indicates the type of work (laboratory), its serial number, volume in hours and name;
- Objective;
- subject and content of the work;
- equipment, technical means, tools;
- order (sequence) of work execution;
- safety and labor protection rules for this work (if necessary);
- general rules for the design of work;
- Control questions;
- tasks;
- list of references (if necessary).

The content of laboratory work is recorded in the working curriculum of the disciplines in the section “List of topics for laboratory work”.

When planning laboratory work, it should be taken into account that, along with the leading goal - confirmation of theoretical principles - in the course of completing tasks, students develop

practical skills and skills in handling laboratory equipment, equipment, etc., which can form part of professional practical training, as well as research skills (observe, compare, analyze, establish dependencies, draw conclusions and generalizations, independently conduct research, document the results).

The composition of tasks for laboratory work should be planned in such a way that they can be completed efficiently by the majority of students in the allotted time.

Laboratory work as a type of educational activity should be carried out in specially equipped educational laboratories. The necessary structural elements of laboratory work, in addition to the independent activity of students, are instructions given by the teacher, as well as the organization of a discussion of the results of the laboratory work.

The completion of laboratory work is preceded by testing students' knowledge - their theoretical readiness to complete the task.

Recommendations for working with literature.

Working with literature is an important stage of a student's independent work in mastering a subject, contributing not only to consolidation of knowledge, but also to broadening his horizons, mental abilities, memory, ability to think, present and confirm his hypotheses and ideas. In addition, research skills necessary for future professional activities are developed.

When starting to study literature on a topic, it is necessary to make notes, extracts, and notes. It is imperative to take notes on the works of theorists, which allow one to comprehend the theoretical basis of the study. For the rest, you can limit yourself to extracts from studied sources. All extracts and quotations must have an exact "return address" (author, title of work, year of publication, page, etc.). It is advisable to write an abbreviated name of the question to which the extract or quotation relates. In addition, it is necessary to learn how to immediately compile a card index of specialized literature and publications of sources, both proposed by the teacher and identified independently, as well as refer to bibliographic reference books, chronicles of journal articles, book chronicles, and abstract journals. In this case, publications of sources (articles, book titles, etc.) should be written on separate cards, which must be filled out in accordance with the rules of bibliographic description (surname, initials of the author, title of work. Place of publication, publisher, year of publication, number of pages, and for journals articles – journal name, year of publication, page numbers). On each card, it is advisable to record the thought of the author of the book or a fact from this book on only one specific issue. If the work, even in the same paragraph or phrase, contains further judgments or facts on another issue, then they should be written out on a separate card. The presentation should be concise, accurate, without subjective assessments. On the back of the card you can make your own notes about this book or article, its contents, structure, what sources it was written on, etc.

Explanations about working with test materials for the course, recommendations for completing homework.

Testing allows you to determine whether the actual behavior of the program corresponds to the expected behavior by performing a specially selected set of tests. A test is the fulfillment of certain conditions and actions necessary to verify the operation of the function being tested or its part. Each question in the discipline must be answered correctly by choosing one option.

Recommendations for completing coursework (if it is included in the curriculum), defining their thematic focus, goals and objectives of implementation, requirements for content, volume, design and organization of management of their preparation on the part of departments and teachers.

According to the guidelines presented in the list of guidelines.

10. EDUCATIONAL WORK

As part of the implementation of the discipline, educational work is carried out to form a modern scientific worldview and a system of basic values, the formation and development of spiritual, moral, civil and patriotic values, a system of aesthetic and ethical knowledge and values, attitudes of tolerant consciousness in society, the formation in students of the need to work as the

first vital necessity, the highest value and the main way to achieve success in life, to understand the social significance of your future profession.

11. LIST OF INFORMATION TECHNOLOGIES USED IN THE EDUCATIONAL PROCESS

11.1. The educational process in the discipline provides for the use of information technologies:

lecturing and conducting practical classes using multimedia;

conducting practical classes using multimedia;

interactive technologies (conducting dialogues, collective discussion of various approaches to solving a particular educational and professional problem);

interaction with students via email;

joint work in the Electronic Information and Educational Environment of St. Petersburg State University of Mathematics and Mathematics: https://spbguvm.ru/academy/eios/

11.2. Software

List of licensed and freely distributed software, including domestically produced ones

No.	Name of technical and computer training aids recommended by sections and topics of the program	License
1	MS Power Point	67580828
2	Libre Office	free software
3	OS Alt Education 8	AAO.0022.00
4	ABIS "MARK-SQL"	02102014155
5	MS Windows 10	67580828
6	System Consultant Plus	503/KL
7	Android OS	free software

12. MATERIAL AND TECHNICAL BASE REQUIRED FOR THE IMPLEMENTATION OF THE EDUCATIONAL PROCESS IN THE DISCIPLINE

Name of the discipline (module), practice in accordance with the curriculum	**Name of special premises and premises for independent work**	**Equipping special rooms and rooms for independent work**
Computer Science and Digital Technologies	137 (196084, St. Petersburg, Chernigovskaya str., building 5) Classroom for conducting seminar-type classes, group and individual consultations, ongoing monitoring and intermediate certification	*Specialized furniture:*desks, chairs, stools, blackboard. *Visual aids and educational materials:*posters by sections.
	138 (196084, St. Petersburg, Chernigovskaya str., building 5) Classroom for conducting seminar-type classes, group and individual	*Specialized furniture:*desks, chairs, stools, blackboard. *Visual aids and educational materials:*posters by section *Equipment:*personal computers

	consultations, ongoing monitoring and intermediate certification	
	206 Large reading room (196084, St. Petersburg, Chernigovskaya str., building 5) Room for independent work	*Specialized furniture*: tables, chairs *Technical training aids:*computers with an Internet connection and access to the electronic information and educational environment
	214 Small reading room (196084, St. Petersburg, Chernigovskaya str., building 5) Room for independent work	*Specialized furniture:*tables, chairs *Technical training aids:*computers with an Internet connection and access to the electronic information and educational environment
	324 Department of Information Technologies (196084, St. Petersburg, Chernigovskaya str., building 5) Room for storage and preventive maintenance of educational equipment	*Specialized furniture:*tables, chairs, special equipment, materials and spare parts for preventive maintenance of educational equipment
	Box No. 3 Carpentry workshop (196084, St. Petersburg, Chernigovskaya str., building 5) Room for storage and preventive maintenance of educational equipment	*Specialized furniture:*tables, chairs, special equipment, materials for preventive maintenance of specialized furniture

Developer:

Head of the department, Associate Professor A.N. Baryshev

Annex 1

Ministry of Agriculture of the Russian Federation
Federal State Budgetary Educational Institution
Of higher education
"St. Petersburg State University of Veterinary Medicine"

Department of Inorganic Chemistry and Biophysics

FUND OF ASSESMENT TOOLS
for the discipline

"COMPUTER SCIENCE AND DIGITAL TECHNOLOGIES"

Level of higher education
SPECIALIST COURSE
Specialty 36.05.01 Veterinary Medicine
Profile: «General clinical veterinary medicine»
Full-time education

Education starts in 2025

Saint Petersburg
2025

1. PASSPORT OF THE ASSESSMENT FUND

Table 1

No.	Molded competencies	Controlled sections (topics) disciplines	Evaluation tool
1.	**UC-1**Able to critically analyze problem situations based on a systematic approach and develop an action strategy: UC-1ID-1 Know the methods of critical analysis and evaluation of modern scientific achievements; basic principles of critical analysis; UC-1ID-2 Be able to obtain new knowledge based on analysis, synthesis, etc.; collect and summarize data on current scientific issues related to the professional field; search for information and solutions based on actions, experiment, experience, information and communication technologies; UC-1ID-3 Be able to study the problem of professional activity using analysis, synthesis and other methods of intellectual activity, including the use of information and communication technologies; identifying problems and using adequate methods to solve them; demonstrating value judgments in solving problematic professional situations.	Section 1. Combinatorics	Tests, test work
2.		Section 2. Probability theory	Tests, test work
3.		Section 3. Random variables	Tests, test work
4.		Section 4. Statistics	Tests, test work
5.	**UC-4** Able to use modern communication technologies, including in foreign language(s), for academic and professional interaction: UC-4ID-1 Know computer and information and communication technologies, information and digital infrastructure in the organization; communication in professional ethics; factors for improving communication in an organization, communication technologies in professional interaction; characteristics of communication flows; the importance of communication in professional interaction; methods for studying the communicative potential of an individual; modern means of information and communication technologies; UC-4ID-2 Be able to create written texts in Russian and foreign languages in scientific and official business styles of speech on professional issues; explore the flow of information through management communications; determine internal communications in the organization, including using digital technologies; UC-4ID-3 Know the principles of forming a communication system; analyze the system of communication links in the organization by implementing oral and written communications, including in a foreign language; presenting plans and results of one's own and team activities using communication technologies; technology for building effective communication in an organization; transmission of	Section 5: Standard Windows Applications	Tests

	professional information in information and telecommunication networks using modern means of information and communication technologies		
6.	**GPC-5**Able to draw up special documentation, analyze the results of professional activities and submit reporting documents using specialized databases: GPC-5_{ID-1}Be able to use new information technologies to solve assigned problems in your professional activities, work with specialized information databases; GPC-5_{ID-2}Possess skills in working with an operating system, with text and spreadsheet processors, with database management systems, with information retrieval systems on the Internet; GPC-5_{ID-3}Know new information technologies to solve problems in your professional activities, work with specialized information databases. **GPC-7**Able to understand the operating principles of modern information technologies and use them to solve professional problems: GPC-7_{ID-1}Know modern technical means and information technologies; GPC-7_{ID-2}Be able to use modern technical tools and information technologies, including elements of machine learning and artificial intelligence, to solve analytical and research problems; GPC-7_{ID-3} Possess the skills to use modern technical means and information technologies to solve analytical and research problems. **PC-19 Is able to organize monitoring studies using big data processing systems and artificial intelligence in professional activities.** PC-19_{ID-1} To know the software packages for automatic management of veterinary documentation. PC-19_{ID-2} To have the skills to work with large amounts of veterinary documentation. PC-19_{ID-3} To possess knowledge in the field of artificial intelligence and data analysis.	Section 6. Technical means for implementing information processes	tests

2. Approximate list of assessment tools

table 2

No.	Name evaluation tool	Brief description of the evaluation tool	Presentation of the assessment tool in the fund
1.	Test	A system of standardized tasks that allows you to automate the procedure measuring the level of knowledge and skills of the student	Test task fund
2.	Test	A tool for testing the ability to apply acquired knowledge to solve problems of a certain type on a topic or section	Set of control tasks for options

3. INDICATORS AND CRITERIA FOR ASSESSING COMPETENCIES AT VARIOUS STAGES OF THEIR FORMATION, DESCRIPTION OF ASSESSMENT SCALES

Table 3

Planned results of mastering the competency	Mastery level				Evaluation tool
	unsatisfactory	satisfactorily	Fine	Great	
UC-1 Able to critically analyze problem situations based on a systematic approach and develop an action strategy					
UC-1ID-1 Know the methods of critical analysis and evaluation of modern scientific achievements; basic principles of critical analysis;	Knowledge level below the minimum requirements, serious errors occurred	Minimum acceptable knowledge level, a lot was allowed minor mistakes	Level of knowledge in in a volume corresponding to the training program, is allowed a few minor mistakes	Level of knowledge in volume corresponding to the program preparation, without errors.	Tests, test work
UC-1ID-2 Be able to obtain new knowledge based on analysis, synthesis, etc.; collect and summarize data on current scientific issues related to the professional field; search for information and solutions based on actions, experiment, experience, information and communication technologies;	When deciding standard tasks did not demonstrate basic skills, there were rough errors	Basic skills have been demonstrated, typical problems with minor errors have been solved, all tasks, but not in in full	All the main ones are demonstrated skills, all basic problems with non-rough ones have been solved errors, all tasks were completed in full, but some with flaws	All the main ones are demonstrated skills, all solved main tasks with separate insignificant shortcomings, all completed assignments in full volume	Tests, control work
UC-1ID-3 Be able to study the problem of professional activity using analysis, synthesis and other methods of intellectual activity, including the use of information and communication technologies; identifying problems and using adequate methods to solve them; demonstrating value judgments in solving problematic professional situations.	When deciding standard tasks do not demonstrate basic skills, there were serious mistakes	Available minimum set skills for solutions standard tasks with some shortcomings	Basic skills demonstrated when deciding standard tasks with some shortcomings	Demonstrated skills in solving non-standard tasks without errors and shortcomings	Tests, control work
UC-4 Able to use modern communication technologies, including in a foreign language(s), for academic and professional interaction (UK-4)					

UC-4ID-1 Know computer and information and communication technologies, information and digital infrastructure in the organization; communication in professional ethics; factors for improving communication in an organization, communication technologies in professional interaction; characteristics of communication flows; the importance of communication in professional interaction; methods for studying the communicative potential of an individual; modern means of information and communication technologies;	Knowledge level below the minimum requirements, serious errors occurred	Minimum acceptable knowledge level, a lot was allowed minor mistakes	Level of knowledge in in a volume corresponding to the training program, is allowed a few minor mistakes	Level of knowledge in volume corresponding to the program preparation, without errors.	tests
UC-4ID-2 Be able to create written texts in Russian and foreign languages in scientific and official business styles of speech on professional issues; explore the flow of information through management communications; determine internal communications in the organization, including using digital technologies.	When deciding standard tasks did not demonstrate basic skills, there were rough errors	Basic skills have been demonstrated, typical problems with minor errors have been solved, all tasks, but not in in full	All the main ones are demonstrated skills, all basic problems with non-rough ones have been solved errors, all tasks were completed in full, but some with flaws	All the main ones are demonstrated skills, all solved main tasks with separate insignificant shortcomings, all completed assignments in full volume	Tests
UC-4ID-3 Know the principles of forming a communication system; analyze the system of communication links in the organization by implementing oral and written communications, including in a foreign language; presenting plans and results of one's own and team activities using communication technologies; technology for building effective communication in an organization; transfer of pro-	When deciding standard tasks do not demonstrate basic skills, there were serious mistakes	Available minimum set skills for solutions standard tasks with some shortcomings	Basic skills demonstrated when deciding standard tasks with some shortcomings	Demonstrated skills in solving non-standard tasks without errors and shortcomings	Tests

fessional information in information and telecommunication networks using modern means of information and communication technologies.					
GPC-5 Able to draw up special documentation, analyze the results of professional activities and submit reporting documents using specialized databases:					
GPC-5_{ID-1}Be able to apply new information technologies to solve assigned problems in your professional activities, work with specialized information databases.	Knowledge level below the minimum requirements, serious errors occurred	Minimum acceptable knowledge level, a lot was allowed minor mistakes	Level of knowledge in in a volume corresponding to the training program, is allowed a few minor mistakes	Level of knowledge in volume corresponding to the program preparation, without errors.	Tests
GPC-5_{ID-2}Possess skills in working with an operating system, with text and spreadsheet processors, with database management systems, with information retrieval systems on the Internet.	When deciding standard tasks did not demonstrate basic skills, there were rough errors	Basic skills have been demonstrated, typical problems with minor errors have been solved, all tasks, but not in in full	All the main ones are demonstrated skills, all basic problems with non-rough ones have been solved errors, all tasks were completed in full, but some with flaws	All the main ones are demonstrated skills, all solved main tasks with separate insignificant shortcomings, all completed assignments in full volume	Tests
GPC-5_{ID-3}Know new information technologies to solve problems in your professional activities, work with specialized information databases.	When deciding standard tasks do not demonstrate basic skills, there were serious mistakes	Available minimum set skills for solutions standard tasks with some shortcomings	Basic skills demonstrated when deciding standard tasks with some shortcomings	Demonstrated skills in solving non-standard tasks without errors and shortcomings	Tests
GPC-7 Able to understand the operating principles of modern information technologies and use them to solve professional problems:					

GPC-7_{ID-1}Know modern technical means and information technologies;	Knowledge level below the minimum requirements, serious errors occurred	Minimum acceptable knowledge level, a lot was allowed minor mistakes	Level of knowledge in in a volume corresponding to the training program, is allowed a few minor mistakes	Level of knowledge in volume corresponding to the program preparation, without errors.	Tests
GPC-7_{ID-2}Be able to use modern technical tools and information technologies, including elements of machine learning and artificial intelligence, to solve analytical and research problems.	When deciding standard tasks did not demonstrate basic skills, there were rough errors	Basic skills have been demonstrated, typical problems with minor errors have been solved, all tasks, but not in in full	All the main ones are demonstrated skills, all basic problems with non-rough ones have been solved errors, all tasks were completed in full, but some with flaws	All the main ones are demonstrated skills, all solved main tasks with separate insignificant shortcomings, all completed assignments in full volume	Tests
GPC-7_{ID-3} Possess the skills to use modern technical means and information technologies to solve analytical and research problems.	When deciding standard tasks do not demonstrate basic skills, there were serious mistakes	Available minimum set skills for solutions standard tasks with some shortcomings	Basic skills demonstrated when deciding standard tasks with some shortcomings	Demonstrated skills in solving non-standard tasks without errors and shortcomings	Tests
PC-19 Is able to organize monitoring studies using big data processing systems and artificial intelligence in professional activities.					
PC-19_{ID-1} To know the software packages for automatic management of veterinary documentation.	Knowledge level below the minimum requirements, serious errors occurred	Minimum acceptable knowledge level, a lot was allowed minor mistakes	Level of knowledge in in a volume corresponding to the training program, is allowed a few minor mistakes	Level of knowledge in volume corresponding to the program preparation, without errors.	Tests

PC-19$_{ID-2}$ To have the skills to work with large amounts of veterinary documentation.	When deciding standard tasks did not demonstrate basic skills, there were rough errors	Basic skills have been demonstrated, typical problems with minor errors have been solved, all tasks, but not in in full	All the main ones are demonstrated skills, all basic problems with non-rough ones have been solved errors, all tasks were completed in full, but some with flaws	All the main ones are demonstrated skills, all solved main tasks with separate insignificant shortcomings, all completed assignments in full volume	Tests
PC-19$_{ID-3}$ To possess knowledge in the field of artificial intelligence and data analysis.	When deciding standard tasks do not demonstrate basic skills, there were serious mistakes	Available minimum set skills for solutions standard tasks with some shortcomings	Basic skills demonstrated when deciding standard tasks with some shortcomings	Demonstrated skills in solving non-standard tasks without errors and shortcomings	Tests

4. LIST OF CHECK TASKS AND OTHER MATERIALS REQUIRED FOR THE ASSESSMENT OF KNOWLEDGE, ABILITIES, SKILLS AND ACTIVITY EXPERIENCE

4.1. Typical tasks for ongoing progress monitoring

UC-1 Able to carry out a critical analysis of problem situations based on a systems approach, and develop an action strategy:

UC -1 $_{ID-1}$ Know the methods of critical analysis and evaluation of modern scientific achievements; basic principles of critical analysis;

UC -1 $_{ID-2}$ Be able to obtain new knowledge based on analysis, synthesis, etc.; collect and summarize data on current scientific problems related to the professional field; search for information and solutions based on actions, experiment, experience, information and communication technologies;

UC -1 $_{ID-3}$ Be able to study the problem of professional activity using analysis, synthesis and other methods of intellectual activity, including the use of information and communication technologies; identify problems and use adequate methods to solve them; demonstrate value judgments in solving problematic professional situations.

CLOSED TYPE TASKS

Tasks of a combined type with the choice of one correct answer from the proposed options

UC -1 $_{ID-1}$ Know the methods of critical analysis and evaluation of modern scientific achievements; basic principles of critical analysis;

Task 1.
Read the task and choose the correct answer.
Which statement is true?
1) To display the task pane, you need to execute the Edit/Task Pane command
2) to display the task pane, you need to execute the View/Task Pane command
3) to display the task pane, you need to execute the File/Task Pane command
4) To display the task pane, you need to execute the command Tools/Task pane
Write down the number under which the correct answer is indicated.
Answer: 2

Task 2.
Read the task and choose the correct answer.
Which of the devices is not included in the standard PC set:
1) mouse;
2) keyboard;
3) monitor;
4) printer;
5) system unit
Write down the number under which the correct answer is indicated.
Answer: 4

Task 3.
Read the task and choose the correct answer.
A spreadsheet is:
1) a set of commands for editing the contents of tables;

2) software for data entry and creation of electronic forms;

3) a specialized program that allows you to create spreadsheets and automate calculations in them;

4) a microcircuit equipped with built-in commands for working with data arrays.

Write down the number under which the correct answer is indicated.

Answer: 3

Tasks of a combined type with a choice of several correct answers from the proposed options

Task 4.

Read the task, choose the correct answers.

The cell cannot contain data in the form...

1) video
2) formulas
3) numbers
4) pictures

Write down the numbers under which the correct answers are indicated.

Answer: 14

Task 5.

Read the task, choose the correct answers.

To select an entire row or column, click the mouse on

1) Sheet
2) Cell
3) Line
4) Column.

Write down the numbers under which the correct answers are indicated.

Answer: 34

Closed-ended tasks to establish compliance

Task 6.

Read the task and match.

Match Excel functions with the types they belong to:

Function		**Function types**	
A	AVERAGE	1	Date and time functions
B	DATAS	2	Statistical functions.
IN	RAZDAT		
G	STAND DEVIATION		

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G

Answer: A 2 B 1 C 1G2

Task 7 .
Read the task and match.
Match the term and its brief definition.

Term		**Definition**	
A	Computer	1	a keyboard device used to control the operation of a computer and input information into it
B	Monitor	2	"graphical" control device
IN	Keyboard	3	electronic information processing device
G	Mouse	4	device for visual reproduction of symbolic and graphic information

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G

Answer: A3B4B1 G 2

UK -1 ID-2 Be able to obtain new knowledge based on analysis, synthesis, etc.; collect and summarize data on current scientific problems related to the professional field; search for information and solutions based on actions, experiments, experience, information and communication technologies ;

Task 8 .
Read the task and match.
Match the corresponding data models with their definitions.

Data Model		Definition	
A	Hierarchical	1	The data model is built on the principle of interconnected tables
B	Network	2	One type of object is the main one, all the lower ones are subordinates
IN	Relational	3	Any data type can be both master and slave at the same time.

Write the selected numbers in the table under the corresponding letters.

A	B	IN

Answer: A3B2B1

Task 9 .
Read the task and match.
Match the device to its purpose

Device		**Purpose**	
A	monitor	1	Input device
B	printer	2	Output devices
IN	digitizer		
G	scanner		

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G

Answer: A2B2B1 G 1

Task 10 .
Read the task and match.
Match the term with its brief definition:

Term		**Definition**	
A	Getting information	1	The process of changing information or taking action using information
B	Information processing	2	Human activities related to the processes of collecting, presenting, processing, storing and transmitting information
IN	Information object	3	Information recorded in some way
G	Information process	4	A purposeful process of changing the content or form of presentation of information
D	Information activities	5	The implementation of the ability of living organisms to reflect various organisms to reflect various properties of the surrounding world

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G	D

Answer: A5B4B3 G 1D2

Closed-ended tasks to establish a sequence

Task 11.
Read the task and establish the sequence.
Arrange the selection areas in ascending order of their “area” (number of selected cells).
1. A1:C3
2. X41:Y42
3.AA500:AA1000
4. B2:BB2
Answer: 2143

Task 12.
Read the task and establish the sequence.
Set the correct order for building a Table in Excel .
1. Creation of functions and formulas necessary to obtain unknown required values.
2. Launch the program and create a new book.
3. Construction of graphs and diagrams for visual interpretation of tabular data.
4. Entering all known initial data and designations.
Answer: 2413

Task 13.
Read the task and establish the sequence.
Establish the order of execution of processes in a closed information system.
1. output of information for sending to the consumer or to another system
2.transformation of input information and its presentation in a convenient form
3.storage of both input information and the results of its processing
4.Input of information from external or internal sources
5.Input of information from the consumer through feedback
Answer: 42315

UK -1 $_{ID-3}$ Be able to study the problem of professional activity using analysis, synthesis and other methods of intellectual activity, including the use of information and communication technologies; identify problems and use adequate methods to solve them; demonstrate value judgments in solving problematic professional situations.

Task 14.
Read the task and establish the sequence.
Access to the file net.txt located on the server org.ru is carried out via the http protocol. Fragments of the file address are encoded with numbers from 1 to 7. Write down the sequence of these numbers encoding the address of the specified file on the Internet.
1) /
2) http
3) org
4) ://
5) .ru

6) net
7) .txt
Answer : 2435167

Task 15.

Read the task and establish the sequence.

Access to the spis.htm file located on the sch.net server is provided via the ftp protocol. The file address fragments are coded with numbers from 1 to 7. Write down the sequence of these numbers encoding the address of the specified file on the Internet.

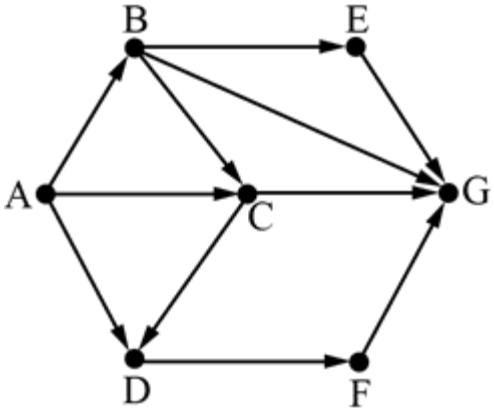
1) ://
2) write
3) .net
4) .htm
5) ftp
6) sch
7) /
Answer: 5163724

OPEN-TYPE TASKS

Task 16.

Read the task and give a reasoned answer.

The picture shows a diagram of roads connecting cities A, B, C, D, E, F, G. Each road can only be traveled in one direction, indicated by the arrow. How many different routes are there from city A to city G?



Answer:

The number of paths to city X = the number of paths by which one can get to any of those cities from which there is a road to X. Using this observation, we will sequentially calculate the number of paths to each of the cities:

A = 1
B = 1
C = 1+1 = 2
D = 2+1 = 3
E = 1
F = 3
G = E + F + C + B = 1 + 3 + 2 + 1 = 7

Task 17.

Read the task and give a reasoned answer .

Convert the number 141 from the decimal number system to the binary number system. How many units does the resulting number contain?

Answer:

Solution:

141 | 2
- 140 | 70 | 2
  1 - 70 | 35 | 2
    0 - 34 | 17 | 2
      1 - 16 | 8 | 2
        1 - 8 | 4 | 2
          0 - 4 | 2 | 2
            0 - 2 | 1
              0

$141_{10} = 1\ 000\ 11\ 0\ 1_{2}$

Answer: 4

Task 18.

Read the task and give a reasoned answer .

Convert the number 10101001 from binary to decimal.

Answer:

Solution:

$10101001_{2} = 1 \cdot 2^{7} + 0 \cdot 2^{6} + 1 \cdot 2^{5} + 0 \cdot 2^{4} + 1 \cdot 2^{3} + 0 \cdot 2^{2} + 0 \cdot 2^{1} + 1 \cdot 2^{0} = 128+0+32+0+8+0+0+1 = 169_{10}$

Task 19.

Read the task and give a reasoned answer .

Calculate the value of the arithmetic expression:

$11011011_{2} + 1110_{8} - 111_{16}$

Write the final answer as a decimal number.

Answer:

Solution:

$11011011_{2} = (1 \times 2^{7}) + (1 \times 2^{6}) + (0 \times 2^{5}) + (1 \times 2^{4}) + (1 \times 2^{3}) + (0 \times 2^{2}) + (1 \times 2^{1}) + (1 \times 2^{0}) = 128 + 64 + 0 + 16 + 8 + 0 + 2 + 1 = 219_{10}$

$1110_{8} = (1 \times 8^{3}) + (1 \times 8^{2}) + (1 \times 8^{1}) + (0 \times 8^{0}) = 512 + 64 + 8 + 0 = 584_{10}$

$111_{16} = (1 \times 16^{2}) + (1 \times 16^{1}) + (1 \times 16^{0}) = 256 + 16 + 1 = 273_{10}$

219 + 584 - 273 = 530Answer: 530

Task 20.

Read the text and give a detailed, reasoned answer.

The automatic camera produces raster images of 1600×1200 pixels. The image file size cannot exceed 2 MB, and no data packaging is performed. What is the maximum number of colors that can be used in the palette?

Answer:

Solution:

2 MB = 2 * 1024 * 1024 * 8 = 16 777 216 bits

i = 16 777 216 / (1600 * 1200) = 8.7 round down = 8 bits / pixel Find the number of colors

$k = 2^i = 2^8 = 256$
Answer: 256

UC- 4 Able to apply modern communication technologies, including in foreign language(s), for academic and professional interaction:

UC -4 $_{ID-1}$ Know computer and information and communication technologies, information and digital infrastructure in an organization; communications in professional ethics; factors for improving communication in an organization, communication technologies in professional interaction; characteristics of communication flows; the importance of communication in professional interaction; methods for studying the communicative potential of an individual; modern means of information and communication technologies;

UC-4 $_{ID-2}$ Be able to create written texts in Russian and foreign languages in scientific and official business styles of speech on professional issues; study the flow of information on management communications; determine internal communications in the organization, including using digital technologies;

UC -4 $_{ID-3}$ To master the principles of forming a communication system; to analyze the system of communication links in an organization by implementing oral and written communications, including in a foreign language; presenting plans and results of one's own and team activities using communication technologies; the technology of building effective communication in an organization; transmitting professional information in information and telecommunication networks using modern means of information and communication technologies

CLOSED TYPE TASKS

Tasks of a combined type with the choice of one correct answer from the proposed options

UC -4 $_{ID-1}$ Know computer and information and communication technologies, information and digital infrastructure in an organization; communications in professional ethics; factors for improving communication in an organization, communication technologies in professional interaction; characteristics of communication flows; the importance of communication in professional interaction; methods for studying the communicative potential of an individual; modern means of information and communication technologies;

Task 21.
Read the task and choose the correct answer.
What symbol should be used to pin the cell address index?
1) $
2) %
3) '
4) !
Write down the number under which the correct answer is indicated.
Answer: 1

Task 22.
Read the task and choose the correct answer.
Spectrophotometry…
The place for connecting external devices is:

1) slot
2) port
3) controller
4) tire
Write down the number under which the correct answer is indicated.
Answer: 2

Task 23.
Read the task and choose the correct answer.
A database cannot exist without objects:
1) without modules;
2) without reports;
3) without forms;
4) without requests
5) without tables
Write down the number under which the correct answer is indicated.
Answer: 5

Tasks of a combined type with a choice of several correct answers from the proposed options

Task 24.
Read the task, choose the correct answers.
Please enter the correct cell address.
1) F7
2) P6
3) 71B
4) U98
Write down the numbers under which the correct answers are indicated.
Answer: 24

Task 25.
Read the task, choose the correct answers.
Which of the following applies to storage media?
1) RAM
2) hard drive
3) flash memory based devices
4) power supply
Write down the numbers under which the correct answers are indicated.
Answer: 23

Closed-ended tasks to establish compliance

Task 26.
Read the task and match.
Match possible errors in Excel with the reasons for their occurrence:

Type of error		**Cause.**	
A	#####	1	The formula contains an incorrectly specified argument (for example, a

			numeric cell and a text cell are summed)
B	#MEANING!	2	Occurs when the data lookup function does not find the searched value in the range
IN	#NAME?	3	The column width is too small to display the number in the cell
G	#N/A	4	The formula contains text that Excel does not recognize.

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G

Answer: A 3 B 1 C 4G2

Task 27 .
Read the task and match.
Match the term and its brief definition.

Term		**Definition.**	
A	Information	1	the main microcircuit of a personal computer
B	System unit	2	an internal device that is installed in one of the slots on the motherboard
IN	Video adapter	3	the main unit of a computer system
G	Microprocessor	4	information about the world around us

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G

Answer: A4B3B2G 1

UC-4 $_{ID-2}$ Be able to create written texts in Russian and foreign languages in scientific and official business styles of speech on professional issues; study the flow of information on management communications; determine internal communications in the organization, including using digital technologies;

Task 28.
Read the task and match.
Match the device with its intended purpose.

Device		Purpose	
A	memory	1	manipulator
B	CPU	2	storage of information
IN	input and output devices	3	information processing
G	mouse	4	transfer of information

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G

Answer: A2B3B4 G 1

Task 29 .
Read the task and match.
Match the device to its type:

Device		Memory type	
A	Flash card	1	Internal memory
B	Winchester	2	External memory
IN	Diskette	3	
G	RAM	4	
D	Magnetic tape	5	
E	Read-only memory		

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G	D	E

Answer : A2B2B2G1D2E1

Task 30 .
Read the task and match.
Establish a correspondence between information security software and its description:

Means		Description	
A	Antivirus program	1	Filters traffic between your computer and the network
B	Encryption program	2	Ensures the safety of information

IN	Firewall	3	Searches for and removes malicious code

Write the selected numbers in the table under the corresponding letters.

A	B	IN

Answer: A3B2B1

Closed-ended tasks to establish a sequence

Task 31.

Read the task and establish the sequence.

Arrange Excel elements in ascending order of their dimensions.

1. Book.
2. Line
3. Cell.
4. Sheet.

Answer: 3241

Task 32.

Read the task and establish the sequence.

Establish the correct order of actions when cleaning your computer.

1. Remove the housing covers, blow off dust from the surfaces and radiator fins with a stream of air from a can or brush it off.
2. Install the components in their original positions, checking all fasteners, cables and the reliability of their fixation. Fasten the covers, assemble the case, connect all external cables.
3. Turn off the power to the PC and disconnect all external cables.
4. Gradually disconnect the components and clean them with suitable tools. When completely disassembling, clean the empty case from the inside.

Answer: 3142

Task 33.

Read the task and establish the sequence.

Set the sequence of moving a text fragment in MSWord:

1. Click on the Cut button on the Home toolbar
2. Select a piece of text
3. Click on the Insert button on the Home toolbar
4. Click to mark the insertion point4

Answer: 2143

Task 34.

Read the task and establish the sequence.

Access to the file ru.txt, located on the server htm.com, is carried out via the http protocol. Fragments of the file address are encoded with numbers from 1 to 7. Write down the sequence of these numbers encoding the address of the specified file on the Internet.

1) /
2) http
3) .com
4) ://
5) ru
6) .txt
7) htm
Answer : 2473156

UC -4 $_{ID-3}$ To master the principles of forming a communication system; to analyze the system of communication links in an organization by implementing oral and written communications, including in a foreign language; presenting plans and results of one's own and team activities using communication technologies; the technology of building effective communication in an organization; transmitting professional information in information and telecommunication networks using modern means of information and communication technologies

Task 35.

Read the task and establish the sequence.

Access to the file doc.htm, located on the server site.com, is carried out via the http protocol. Fragments of the file address are encoded with numbers from 1 to 7. Write down the sequence of these numbers encoding the address of the specified file on the Internet.

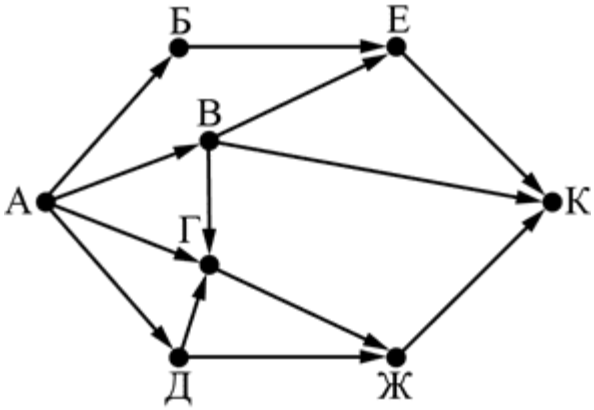
1) site
2) ://
3) doc
4) /
5) .htm
6) .com
7) http
Answer : 7216435

OPEN-TYPE TASKS

Task 36.

Read the task and give a reasoned answer.

The picture shows a diagram of roads connecting cities A, B, C, D, E, G and K. Each road can only be traveled in one direction, indicated by the arrow. How many different routes are there from city A to city K?



Answer:

The number of paths to city X = the number of paths by which one can get to any of those cities from which there is a road to X. Using this observation, we will sequentially calculate the number of paths to each of the cities:

A = 1
B = 1
B = 1
D = 1
G = 1 +1 + 1 = 3
E = 1 + 1 = 2
F = 1 + 3 = 4
K = 1 + 2 + 4 = 7

Task 37.

Read the task and give a reasoned answer .

Convert the number 100 from the decimal number system to the binary number system. How many units does the resulting number contain?

Answer:

Solution:

100 | 2
- 100 | 50 | 2
0 - 50 | 25 | 2
0 - 24 | 12 | 2
1 - 12 | 6 | 2
0 - 6 | 3 | 2
0 - 2 | **1**
1

$100_{10} = 11\ 00\ 1\ 00_2$
Answer: 3

Task 38.

Read the task and give a reasoned answer .

Convert the number 101110 from binary to decimal.

Answer:

Solution:

$101110_2 = 1 \cdot 2^5 + 0 \cdot 2^4 + 1 \cdot 2^3 + 1 \cdot 2^2 + 1 \cdot 2^1 + 0 \cdot 2^0 = 32+0+8+4+2+0 = 46_{10}$

Task 39.

Read the task and give a reasoned answer .

Calculate the value of the arithmetic expression:

$110111_2 + 1101_8 - 110_{16}$

Write the final answer as a decimal number.

Answer:

Solution:

$110111_2 = (1 \times 2^5) + (1 \times 2^4) + (0 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (1 \times 2^0) = 32 + 16 + 0 + 4 + 2 + 1 = 55_{10}$

$1101_8 = (1 \times 8^3) + (1 \times 8^2) + (0 \times 8^1) + (1 \times 8^0) = 512 + 64 + 0 + 1 = 577_{10}$

$110_{16} = (1 \times 16^2) + (1 \times 16^1) + (0 \times 16^0) = 256 + 16 + 0 = 272_{10}$

55 + 577 - 272 = 360Answer: 360

.

Task 40.

Read the text and give a detailed, reasoned answer.

To store a raster image of 330 × 512 pixels, no more than 220 KB of memory is allocated, not counting the size of the file header. The same number of bits is used to encode the color of each pixel, the pixel codes are written to the file one after another without gaps. What is the maximum number of colors that can be used in the image palette?

Answer:

Solution:

220 KB = 1 802 240 bits

i = 1 802 240 / (330 * 512) = 10.6 round down = 10 bits / pixel Find the number of colors

$k = 2^{i} = 2^{10} = 1024$

Answer: 1024

GPC-5 is capable of preparing special documentation, analyzing the results of professional activities and submitting reporting documents using specialized databases:

GPC-5 $_{ID-1}$ Be able to apply new information technologies to solve assigned tasks in one's professional activities, work with specialized information databases;

GPC-5 $_{ID-2}$ Have skills in working with an operating system, with text and spreadsheet processors, with database management systems, with information retrieval systems on the Internet;

GPC-5 $_{ID-3}$ Know new information technologies to solve tasks in your professional activities, work with specialized information databases.

CLOSED TYPE TASKS

Tasks of a combined type with the choice of one correct answer from the proposed options

GPC-5 $_{ID-1}$ Be able to apply new information technologies to solve assigned tasks in one's professional activities, work with specialized information databases;

Task 41.

Read the task and choose the correct answer.

Which of the following is not a Microsoft Publisher object?

1) Booklet
2) Calendar
3) Table
4) Poster

Write down the number under which the correct answer is indicated.

Answer: 3

Task 42.

Read the task and choose the correct answer.

Information in a broad sense is:

1) a set of characters;
2) messages transmitted in the form of signs, signals;
3) information that completely removes or reduces the uncertainty that existed prior to its receipt;
4) information about the surrounding world and the processes occurring in it, perceived by humans or special devices.

Write down the number under which the correct answer is indicated.

Answer: 4

Task 43.

Read the task and choose the correct answer.

A computer that provides its resources for use by other computers when working together is called:

1) modem;
2) router;
3) server;
4) workstation;
5) switch.

Write down the number under which the correct answer is indicated.

Answer: 3

Tasks of a combined type with a choice of several correct answers from the proposed options

Task 44.

Read the task, choose the correct answers.

What programs are not spreadsheets?

1) Excel
2) Quattropro
3) PowerPoint
4) Word

Write down the numbers under which the correct answers are indicated.

Answer: 34

Task 45.

Read the task, choose the correct answers.

Select the correct statements:

1) A text editor is a driver for a device.
2) The universal format of text files that does not preserve text formatting is .txt
3) A text editor is a program for editing and formatting text.
4) The original format of Word documents is .txt

Write down the numbers under which the correct answers are indicated.

Answer: 23

Closed-ended tasks to establish compliance

Task 46.

Read the task and match.

Match specific programs with the software types they belong to:

Programs		**Program type**	
A	Chrome	1	Spreadsheets
B	Safari	2	Internet browsers
IN	Excel		
G	LibreOffice Calc		

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G

Answer: A 2 B 2 C 1D 1

Task 4 7 .

Read the task and match.

Match the PC user's level with his/her skills.

Skills		**User level**	
A	Knowledge of the basic functions of the operating system	1	Beginner user
B	Proficiency in Word and Excel, working with email, various browsers	2	Average
IN	Proficiency in software from the MS Office package, specialized software in a specific professional field, project management systems	3	Confident user
G	Ability to troubleshoot technical issues, software errors, programming skills	4	Advanced

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G

Answer: A 1 B2B3 D 4

Task 48.

Read the task and match.

Match the type of computer virus with its brief description

VALUES		**VALUES**	
A	Allows an attacker to control the user's computer. Computers infected with this virus can be networked and used for mass attacks on websites or spam distribution. The user may not even realize that his computer is being used by an attacker.	1	Worms
B	It is the most dangerous type of virus, as it is disguised in other harmless programs. And until the moment the user does not	2	Viruses - spies

	launch this harmless program, this virus does not pose any danger and is not easy to detect. This virus can cause various damage to the computer. They are mainly used to steal, change or delete the user's personal data. A distinctive feature of the virus is that it cannot reproduce itself.		
IN	A program that makes copies of itself. Its harm lies in cluttering up the computer, which makes it work slower. Its distinctive feature is that it cannot become part of another harmless program.	3	Zombie
G	They collect information about the user's actions and behavior. They are mainly interested in information such as addresses, passwords, credit card details.	4	Trojan viruses

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G

Answer: A 3 B 4 C 1D 2

GPC-5 $_{ID-2}$ Have skills in working with an operating system, with text and spreadsheet processors, with database management systems, with information retrieval systems on the Internet;

Task 4 9 .

Read the task and match.

Establish a correspondence between the types of color models and their color components.

Type of color models		**Color component**	
A	Raster graphics	1	smallest element object, line
B	3D graphics	2	smallest element triangle snowflake set smallest
IN	Fractal graphics	3	element different graphic figures and smooth surfaces
G	Vector graphics	4	smallest element point

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G

Answer: A4B3B2G 1

Task 50.

Read the task and match.

Establish a correspondence between the logical operation and its designation:

Logical operation		**Designation of logical operation**	
A	Sum modulo two	1	↔
B	Disjunction.	2	∧
IN	Conjunction	3	→
G	Implication	4	∨
		5	⊖

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G

Answer: A5B4B2 G 3

Closed-ended tasks to establish a sequence

Task 51.

Read the task and establish the sequence.

Having established the order of numbers, indicate how the IF function will look correctly when, if the condition is met, the number is divided by 2, and if not met, it is multiplied.

1. B2*2
2. =IF
3. B2>10
4. B2/2

Answer: 2341

Task 52.

Read the task and establish the sequence.

Arrange the following values in ascending order of the amount of information stored.

1. Kilobyte
2. Terabyte
3. Gigabit
4. Megabit

Answer: 1432

Task 53.

Read the task and establish the sequence.

Please provide the correct address of the file location on your PC.

1. 1st course\3rd lecture. pptx
2. Users \1\
3. C:\
4. Desktop\Lectures Computer Science\

Answer: 3241

Task 54.

Read the task and establish the sequence.

Access to the file txt.com, located on the server net.ru, is carried out via the http protocol. Fragments of the file address are encoded with numbers from 1 to 7. Write down the sequence of these numbers encoding the address of the specified file on the Internet.

1) /
2) net
3) .com
4) ://
5) .ru
6) http
7) txt

Answer : 6425173

GPC-5 $_{ID-3}$ Know new information technologies to solve tasks in your professional activities, work with specialized information databases.

Task 55.

Read the task and establish the sequence.

Access to the file net.txt, located on the server html.ru, is carried out via the http protocol. In the table, fragments of the file address are encoded with numbers from 1 to 7. Write down the sequence of numbers encoding the address of the specified file on the Internet.

1 .ru
2 ://
3 html
4 net
5 /
6 http
7 .txt

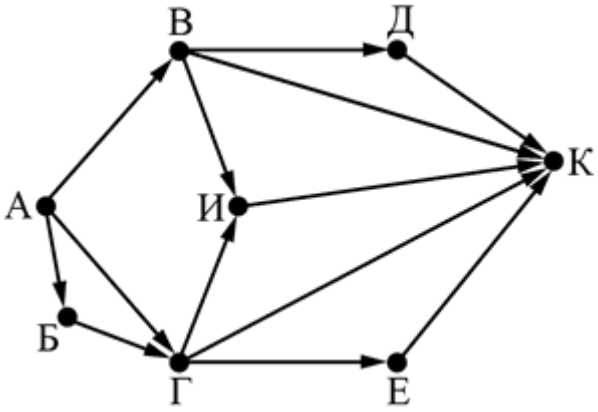
Answer : 1572643

OPEN-TYPE TASKS

Task 56.

Read the task and give a reasoned answer.

The picture shows a diagram of roads connecting cities A, B, C, D, E, I, K. On each road you can only move in one direction, indicated by the arrow. How many different routes are there from city A to city K?



Answer:

The number of paths to city X = the number of paths by which one can get to any of those cities from which there is a road to X. Using this observation, we will sequentially calculate the number of paths to each of the cities:

A = 1
B = 1
B = 1
G = A + B = 1 + 1 = 2
I = G + B = 2 + 1 = 3
D = B = 1
E = G = 2
K = D + B + I + G + E = 1 + 1 + 3 + 2 + 2 = 9

Task 57.

Read the task and give a reasoned answer .

Convert the number 135 from the decimal number system to the binary number system. How many units does the resulting number contain?

Answer:

135 | 2
- 134 |67 | 2
1 - 66 |33 | 2
1 - 32 |16 | 2
1 - 16 |8 | 2
0 - 8 |4 | 2
0 - 4 |2 | 2
0 - 2 | **1**
0

$135_{10} = 1\ 0000\ 111_2$
Answer: 4

Task 58.

Read the task and give a reasoned answer .

Convert the number 111001 from binary to decimal.

Answer:

Solution:

$111001_2 = 1\cdot2^5+1\cdot2^4+1\cdot2^3+0\cdot2^2+0\cdot2^1+1\cdot2^0 = 32+16+8+0+0+1 = 57_{10}$

.

Task 59.

Read the task and give a reasoned answer .

Calculate the value of the arithmetic expression:

$11111011_{2} + 1101_{8} - 101_{16}$

Write the final answer as a decimal number.

Answer:

Solution:

$11111011_{2} = (1 \times 2^{7}) + (1 \times 2^{6}) + (1 \times 2^{5}) + (1 \times 2^{4}) + (1 \times 2^{3}) + (0 \times 2^{2}) + (1 \times 2^{1}) + (1 \times 2^{0}) = 128 + 64 + 32 + 16 + 8 + 0 + 2 + 1 = 251_{10}$

$1101_{8} = (1 \times 8^{3}) + (1 \times 8^{2}) + (0 \times 8^{1}) + (1 \times 8^{0}) = 512 + 64 + 0 + 1 = 577_{10}$

$101_{16} = (1 \times 16^{2}) + (0 \times 16^{1}) + (1 \times 16^{0}) = 256 + 0 + 1 = 257_{10}$

251 + 577 - 257 = 571Answer: 571

Task 60.

Read the text and give a detailed, reasoned answer.

To store an arbitrary raster image of 1024×1024 pixels, 1 MB of memory is allocated, not including the file header size. The same number of bits is used to encode the color of each pixel, the pixel codes are written to the file one after another without gaps. What is the maximum number of colors that can be used in an image?

Answer:

Solution:

We translate into the SI system

$1 \text{ MB} = 1 \cdot 2^{10} \cdot 2^{10} \cdot 2^{3} = 2^{23}$ bits

We find the coding depth

$i = 2^{23}/(1024 \times 1024) = 2^{23}/(2^{10} \cdot 2^{10}) = 2^{3} = 8$

We find the number of colors

$k = 2^{i} = 2^{8} = 256$

Answer: 256

GPC-7 Able to understand the principles of operation of modern information technologies and use them to solve problems of professional activity:

GPC-7 $_{ID-1}$ Know modern technical means and information technologies;

GPC-7 $_{ID-2}$ Be able to use modern technical means and information technologies, including elements of machine learning and artificial intelligence, to solve analytical and research problems;

GPC-7 $_{ID-3}$ Possess the skills to use modern technical means and information technologies to solve analytical and research problems.

CLOSED TYPE TASKS

Tasks of a combined type with the choice of one correct answer from the proposed options

GPC-7 $_{ID-1}$ Know modern technical means and information technologies;

Task 61.

Read the task and choose the correct answer.

A header is:

1) the area that is located in the upper and lower margins and is intended for placing the title of the work on the text of each page;

2) the appearance of printed characters that the user sees in the text editor window;

3) the top line of the Word editor window, which contains the command bar (for example, “Insert”, “Designer”, “Layout”, etc.).

4) The bottom line of the Word editor, which contains information about the number of pages, the spelling check language

Write down the number under which the correct answer is indicated.

Answer: 1

Task 62.

Read the task and choose the correct answer.

In a computer, the system bus is controlled by

1) ROM chip;
2) RAM;
3) system bus driver;
4) microprocessor or via an additional microcircuit controller

Write down the number under which the correct answer is indicated.

Answer: 4

Task 63.

Read the task and choose the correct answer.

To create a relationship between table fields, use the dialog box:

1) connection table;
2) connection diagram;
3) data schema;
4) data table

Write down the number under which the correct answer is indicated.

Answer: 4

Tasks of a combined type with a choice of several correct answers from the proposed options

Task 64.

Read the task, choose the correct answers.

What type of sorting does not exist in Excel?

1) by size
2) in descending order
3) by filling time
4) ascending

Write down the numbers under which the correct answers are indicated.

Answer: 13

Task 65.

Read the task, choose the correct answers.

What are computer operating systems?

1) DOS, Linux
2) Windows
3) Word, Excel, Power Point
4) Dr. Web, Kaspersky Anti-Virus

Write down the numbers under which the correct answers are indicated.

Answer: 12

Closed-ended tasks to establish compliance

Task 66.

Read the task and match.

Establish a correspondence between the spelling of an Excel function and its correctness.

Writing a function.		**Function.**	
A	=IF(L8>0;L8+M8;L8-M8)	1	The function is correct.
B	=IF(L8>0;D8+M8;D8-M8)	2	There is an error in the function.
IN	+SUM(N17:Q17)		
G	=SUM(N17:Q17)		

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G

Answer: A 1 B 2 C 2G1

Task 67.

Read the task and match.

Distribute storage devices between two and subgroups.

Device.		**Subgroup**	
A	Flash card	1	External devices
B	RAM	2	Internal devices
IN	CMOS memory		
G	Optical CD, DVD, BD		

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G

Answer: A1B2B2G 1

GPC-7 $_{ID-2}$ Be able to use modern technical means and information technologies, including elements of machine learning and artificial intelligence, to solve analytical and research problems;

Task 68.

Read the task and match.

Match the type of system software with its purpose.

Type of system software		His purpose	
A	operating system	1	adapts other programs to work with Cyrillic fonts
B	File manager	2	controls the operation of an external device
IN	Driver	3	allows you to perform actions with the file structure of your PC
		4	ensures the integrated functioning of all PC devices

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G

Answer: A4B3B2

Task 69.

Read the task and match.

Match the name of the local network topology with its description.

Name		Description	
A	Tire	1	A topology in which each computer connects to only two of its neighbors
B	Ring	2	Each workstation on the network is connected to several other workstations on the same network.
IN	Star	3	The topology is based on a common cable (trunk) to which all workstations are connected.
G	Mesh topology	4	In this topology, all computers are connected to each other using a central hub.

Write the selected numbers in the table under the corresponding letters.

A	B	IN	G

Answer: A3B1B4 G 2

Task 70.

Read the task and match.

Establish a correspondence between the components of information security and their definitions:

Component	Definition

A	Confidentiality	1	The immutability of information when certain operations are performed on it
B	Integrity	2	Requirement not to transfer information to third parties
IN	Availability	3	The ability of subjects to exercise their rights of access to information

Write the selected numbers in the table under the corresponding letters.

A	B	IN

Answer: A2B1B3

Closed-ended tasks to establish a sequence

Task 71.
Read the task and establish the sequence.
Step-by-step instructions for importing data from Excel into Access .
1. In the External data menu item, select Import Excel spreadsheet .
2. In the communication window, configure all the necessary data.
3. Open Access and create a new Database in it.
4. Select source and destination.
Answer: 3142

Task 72.
Read the task and establish the sequence.
Access database.
1. Open Access. If Access is already open, on the File tab, select New.
2. Enter a name for the database, select a location, and then click Create.
3. Fill in the required information, if necessary, by clicking the Enable Content button on the yellow message bar.
4. Select an empty database or template.
Answer: 1423

OPK-7 $_{ID-3}$ Possess the skills to use modern technical means and information technologies to solve analytical and research problems.

Task 73.
Read the task and establish the sequence.
Specify the sequential chain of elements that forms an email address:
1. Username
2. The @ symbol
3. Domain
4. Mail server name
Answer: 1243

Task 74.

Read the task and establish the sequence.

Access to the olymp.htm file located on the school.ru server is provided via the http protocol. The file address fragments are coded with numbers from 1 to 7. Write down the sequence of these numbers encoding the address of the specified file on the Internet.

1) ://
2) school
3) .htm
4) olymp
5) .ru
6) /
7) http

Answer : 7125643

Task 75.

Read the task and establish the sequence.

Access to the file name.gif, located on the server jour.com, is carried out via the ftp protocol. Fragments of the file address are encoded with numbers from 1 to 7. Write down the sequence of these numbers encoding the address of the specified file on the Internet.

1) .com
2) ftp
3) journal
4) /
5) ://
6) .gif
7) name

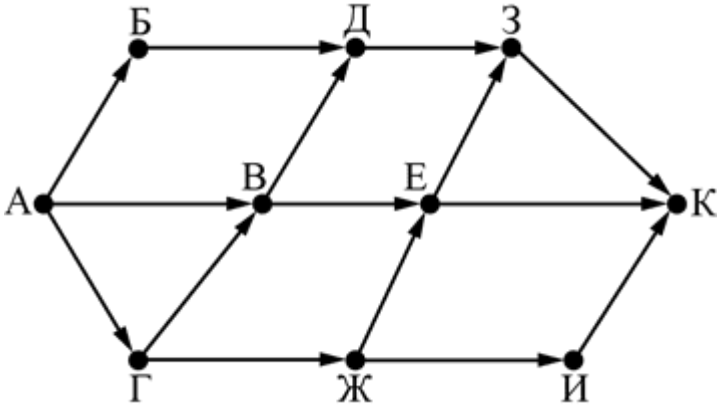
Answer : 2531476

OPEN-TYPE TASKS

Task 76.

Read the task and give a reasoned answer.

The picture shows a diagram of roads connecting cities A, B, C, D, E, F, G, H, I, K. On each road you can only move in one direction, indicated by the arrow. How many different routes are there from city A to city K?



Answer:

The number of paths to city X = the number of paths by which one can get to any of those cities from which there is a road to X. Using this observation, we will sequentially calculate the number of paths to each of the cities:

A = 1

B = 1
B = 1 +1 = 2
G = 1
D = 2 + 1 = 3
E = 1 + 2 = 3
W = 1
I = 1
Z = 3 + 3 = 6
K = 6 + 3 + 1 = 10

Task 77.

Read the task and give a reasoned answer .

Convert the number 201 from decimal to binary.

Answer:

Solution:

201 | 2
- 200 | 100 | 2
1 - 100 | 50 | 2
0 - 50 | 25 | 2
0 - 24 | 12 | 2
1 - 12 | 6 | 2
0 - 6 | 3 | 2
0 - 2 | 1
1

Answer: 11001001

Task 78.

Read the task and give a reasoned answer .

Convert the number 1011101 from binary to decimal.

Answer:

Solution:

$1011101_2 = 1 \cdot 2^6 + 0 \cdot 2^5 + 1 \cdot 2^4 + 1 \cdot 2^3 + 1 \cdot 2^2 + 0 \cdot 2^1 + 1 \cdot 2^0 = 64+0+16+8+4+0+1 = 93_{10}$

Task 79.

Read the task and give a reasoned answer .

Calculate the value of the arithmetic expression:

$11101101_2 + 1001_8 + 101_{16}$

Write the final answer as a decimal number.

Answer:

Solution:

$11101101_2 = (1 \times 2^7) + (1 \times 2^6) + (1 \times 2^5) + (0 \times 2^4) + (1 \times 2^3) + (1 \times 2^2) + (0 \times 2^1) + (1 \times 2^0) = 128 + 64 + 32 + 0 + 8 + 4 + 0 + 1 = 237_{10}$

$1001_8 = (1 \times 8^3) + (0 \times 8^2) + (0 \times 8^1) + (1 \times 8^0) = 512 + 0 + 0 + 1 = 513_{10}$

$101_{16} = (1 \times 16^2) + (0 \times 16^1) + (1 \times 16^0) = 256 + 0 + 1 = 257_{10}$

237 + 513 + 257 = 1007Answer: 1007

Task 80.

Read the text and give a detailed, reasoned answer.

The automatic traffic violation recording device takes color photographs measuring 1280×960 pixels using a palette of 2048 colors. The photographs are stored in the camera's

memory, grouped into packets of several, and then transmitted to the data processing center at a data transfer rate of 1,392,640 bits/s. What is the maximum possible number of photographs in one packet if no more than 240 seconds are allocated for the transmission of one packet? Write an integer in your answer.

Answer:

Solution:

1. 2048 colors = 2^11 ⇒ i = 11 bits per symbol 1280*960*11 = 13,516,800 bits - the size of the image in the packet = (1,392,640*240)/13,516,800 = 24.7, but part of the image cannot be, round down = 24 Answer: 24

PC-19. It is able to organize monitoring studies using systems for processing large amounts of data and artificial intelligence in professional activities.

PC-19.1 - software complexes for automatic management of veterinary documentation

PC-19.2 Master the skills of working with large amounts of veterinary documentation

PC-19.3 Possess knowledge in the field of artificial intelligence and data analysis

CLOSED-TYPE TASKS

Combined tasks with a choice of one correct answer from the suggested options

PC-19.1 - software complexes for automatic management of veterinary documentation

Task 81.

Read the task and choose the correct answer.

The Microsoft Publisher program is designed for:

1) for creating, editing, and formatting text documents;

2) for creating, editing and formatting electronic presentations;

3) to prepare the original layout of the publication, ready for transfer to the printing house

4) for publishing news, photos, advertising, etc. on websites.

Write down the number below which the correct answer is indicated

Task 82.

Read the task and choose the correct answer.

…….. An editor is a program designed for creating, editing, and formatting text information.

1) Text-based.

2) Graphic;

3) Vector;

4) Tabular.

Write down the number below which the correct answer is indicated

Task 83.

Read the task and choose the correct answer.

A group of computers connected by information transmission channels and located within a territory limited by small dimensions: rooms, buildings, businesses, is called ...

1) a global computer network;

2) an information system with hyperlinks;

3) a local computer network;

4) a regional computer network.

Write down the number below which the correct answer is indicated

Tasks of a combined type with a choice of several correct answers from the suggested options

Task 84.
Read the task and choose the correct answers.
What is the main purpose of spreadsheets?
1) edit and format text documents
2) perform calculations using the formulas
3) store large amounts of information
4) processing of numerical data
Write down the numbers below which the correct answers are indicated

Task 85.
Read the task and choose the correct answers.
Read the task and choose the correct answers.
Which functions are not considered Logical?
1) Function And
2) SUM function
3) Function IF
4) CP function.
Write down the numbers below which the correct answers are indicated

Closed-type compliance tasks

Task 86.
Read the assignment and make sure it matches.
Establish a correspondence between specific programs and the types of software they belong to:

Programs		**Software Type**	
A	Google Docs	1	Text editors
B	Access	2	Programs for creating a database
In	Oracle		
D	LibreOffice Writer		

Write down the selected numbers under the corresponding letters in the table.

A	B	In	C D

Task 87.
Read the assignment and make sure it matches.
Set a match between the purpose of the Excel function and its name.

Function name	**Destination**

A	POISSON.PARSE	1	Returns the smallest value in the argument list.
B	FISCHER	2	Returns the Poisson distribution.
In	MIN	3	, Returns the Fisher transform for the argument x.
R	WED	= 4	Returns the arithmetic mean of the arguments.

Write down the selected numbers under the corresponding letters in the table.

A	B	In	C D

PC-19.2 Master the skills of working with large amounts of veterinary documentation

Task 88.
Read the assignment and make sure it matches.
Set a match between the device and its types.

Type		**Device Type**	
A	Vertical	1	Computer Case
B	Manual	2	Scanner
In	C Horizontal.		
D	Flatbed		

Write down the selected numbers under the corresponding letters in the table.

A	B	In	C D

Task 89.
Read the assignment and make sure it matches.
Establish a correspondence between the system software elements and their description.

System software element		**Description**	
A	The operating system	1	controls the operation of an external device
B	The file manager	2	allows you to perform actions with the file structure of the PC
C The	driver	3	adapts other programs to work with Cyrillic fonts

		4	ensures the complete functioning of all PC devices

Write down the selected numbers under the corresponding letters in the table.

A	B	In	C D

Task 90.

Read the assignment and make sure it matches.

Set a match between the number in the decimal system and its translation to hexadecimal system:

Number in decimal Notation		**Number in hexadecimal notation**	
A	$375_{(10)}$	1	$1C_{(16)}$
B	$597_{(10)}$	2	$177_{(16)}$
In	C $492_{(10)}$	3	$21B_{(16)}$
D	$678_{(10)}$	4	$255_{(16)}$
		5	$2A6_{(16)}$

Write down the selected numbers under the corresponding letters in the table.

A	B	In	C D

Closed - type tasks for establishing a sequence

Task 91.

Read the task and set the sequence.

To create a custom format, you must perform the following steps in a specific order. Enter it in numbers:

1. In the Format menu, select Cells, and then open the tab
Number.
2. In the Numeric Formats list, select (all formats).
3. Select the cells whose format you want to change.
4. Enter format codes in the Type field.

Task 92.

Read the task and set the sequence.

How do I create a pivot table?

1. Select the cells that you want to use to create a pivot table. This creates a pivot table based on an existing table or range.
2. On the Home tab, in the Cells group, click Format.
3. Save the pivot table by clicking OK.
4. Select the location of the pivot table report.

Task 93.

Read the task and set the sequence.

Arrange the parts of the site address in the correct order.

1. www.
2. https://
3. .com
4. Google

Task 94.

Read the task and set the sequence.

File access htm.net located on the server com.edu, performed via the ftp protocol. Fragments of the file address are encoded with numbers from 1 to 7.Write down the sequence of these numbers that encodes the address of the specified file on the Internet.

1) /
2) com
3) .edu
4) ://
5) .net
6) htm
7) ftp

PC-19.3 Possess knowledge in the field of artificial intelligence and data analysis

Task 95.

Read the task and set the sequence.

Mama mailbox.5 is located on the server dom.ru. In the table, fragments of an email address are encoded with numbers from 1 to 6.Write down the sequence of digits that encode this address.

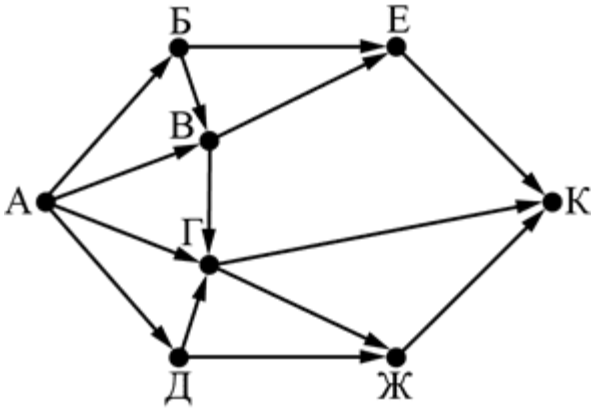
1 .
2 .ru
3 dom
4 @
5 5
6 mama

OPEN-TYPE TASKS

Task 96.

Read the assignment and give a reasonable answer

The drawing shows a map of roads connecting cities A, B, C, D, D, E, W, and K. Each road can only be used in one direction, as indicated by the arrow. How many different paths are there from city A to city K?



Task 97.

Read the assignment and give a reasonable answer.

Convert the number 204 from decimal to binary

Task 98.

Read the assignment and give a reasonable answer.

Convert the number 110110 from binary to decimal.

Task 99.

Read the assignment and give a reasonable answer.

Calculate the value of the arithmetic expression:

$10111101_2 + 1101_8 + 111_{16}$

Write down a decimal number as the final answer.

Task 100.

Read the text and give a detailed reasoned answer

How many seconds will it take for a typical modem transmitting messages at 28,800 bps to transmit a 640-by-480 pixel color bitmap, assuming that the color of each pixel is encoded in 3 bytes?

Answer:

Solution:

3 bytes = 3*8 = 24 bits - color depth i

Image size 640 * 480 * 24 = 7372800 bits

7372800 : 28800 = 256 s

1.2 Typical tasks for intermediate certification

1.2.1 List of questions for testing

UC-1 Able to critically analyze problem situations based on a systematic approach and develop an action strategy:

UC-1ID-1 Know the methods of critical analysis and evaluation of modern scientific achievements; basic principles of critical analysis;

1. Classification of events. Determination of reliable, unreliable and equally possible events.
2. Definition of random and opposite events. How are these events related to each other?

3. Definition of joint and non-joint events..
4. Definition of dependent and independent events.
5. Classic definition of probability. Properties of the probability of various events.
6. Definition of a complete group of incompatible events. Theorem and corollary on the complete group of events.
7. Probability addition theorems.
8. Probability multiplication theorems.
9. Total probability formula. Definition of hypotheses and properties of hypotheses.
10. Repeated tests. Bernoulli's formula. Poisson's formula.
11. Definition and formula of permutations Pn. Definition and formula of Combinations C_n^m.

UC-1ID-2 Be able to obtain new knowledge based on analysis, synthesis, etc.; collect and summarize data on current scientific issues related to the professional field; search for information and solutions based on actions, experiment, experience, information and communication technologies;

12. Random variables and probability distribution function, discrete random variables. Continuous random variables and probability density function.
13. Characteristics of random variable distributions (expectation, dispersion, median, mode). Examples of distribution of random variables.
14. Binomial distribution, Poisson distribution, normal distribution.
15. Distributions related to normal (c2 distribution, Student distribution and Fisher distribution).
16. Subject of mathematical statistics. Main goals.
17. Basic concepts of mathematical statistics – population, sample, sample representativeness. Concept of statistical evaluation. Properties of assessments: unbiased, consistent, effective.

UC-1_{ID-3}Be able to study the problem of professional activity using analysis, synthesis and other methods of intellectual activity, including the use of information and communication technologies; identifying problems and using adequate methods to solve them; demonstrating value judgments in solving problematic professional situations.

18. Descriptive and graphical methods of data analysis. Histogram: empirical distribution function.
19. Column and pie charts.
20. Point estimates of the numerical characteristics of the distribution (empirical frequency, sample mean, sample variance). Interval estimation.
21. Confidence interval. Confidence intervals for mathematical expectation and variance of normal distribution.
22. The logic of testing statistical hypotheses. Errors of the first and second kind, level of significance and power of the test.
23. Fischer, Student, Kolmogorov-Smirnov goodness-of-fit tests.

UC-4 Able to use modern communication technologies, including in foreign language(s), for academic and professional interaction:

UC-4ID-1 Know computer and information and communication technologies, information and digital infrastructure in the organization; communication in professional ethics; factors for improving communication in an organization, communication technologies in professional interaction; characteristics of communication flows; the importance of communication in professional interaction; methods for studying the communicative potential of an individual; modern means of information and communication technologies;

24. Standard Windows software application:

25. Windows operating system.
26. Windows OS settings.
27. Windows graphical interface. Task bar.

UC-4ID-2 Be able to create written texts in Russian and foreign languages in scientific and official business styles of speech on professional issues; explore the flow of information through management communications; determine internal communications in the organization, including using digital technologies;

28. Program "Explorer". Ability to search for folders and files.
29. Windows specifications.

UC-4ID-3 Know the principles of forming a communication system; analyze the system of communication links in the organization by implementing oral and written communications, including in a foreign language; presenting plans and results of one's own and team activities using communication technologies; technology for building effective communication in an organization; transfer of professional information in information and telecommunication networks using modern means of information and communication technologies.

30. Computer networks. Internet services

GPC-5 Able to draw up special documentation, analyze the results of professional activities and submit reporting documents using specialized databases:

GPC-5_{ID-1}Be able to use new information technologies to solve assigned problems in your professional activities, work with specialized information databases;

31. PC software – system and special
32. Types of operating systems. Operating system requirements.

GPC-5_{ID-2}Possess skills in working with an operating system, with text and spreadsheet processors, with database management systems, with information retrieval systems on the Internet;

33. Analysis of statistical data in MS Office 2007 in MS Excel
34. Excel spreadsheet processor.

GPC-5ID-3 Know new information technologies to solve assigned tasks in your professional activities, work with specialized information databases.

35. DatabasesAccess.

GPC-7 Able to understand the operating principles of modern information technologies and use them to solve professional problems:

GPC-7_{ID-1}Know modern technical means and information technologies;

36. Computer science: science, technology, industry.
37. Binary number system. Its connection with the decimal number system. Converting numbers from one system to another and vice versa.
38. Octal number system. Its connection with the decimal number system. Converting numbers from one system to another and vice versa.

39. Hexadecimal number system. Its connection with the decimal number system. Converting numbers from one system to another and vice versa.
40. Composition and characteristics of the main memory of a PC.
41. External memory devices.
42. PC input devices. PC output devices.
43. Operating system DOS. Components and their purpose.
44. PC software – system and special.
45. Information Security. Methods for protecting information in networks.

GPC-7_{ID-2}Be able to use modern technical tools and information technologies, including elements of machine learning and artificial intelligence, to solve analytical and research problems;

46. Classification and characteristics of computer viruses. Modern antivirus tools.

GPC-7ID-3 Possess the skills to use modern technical means and information technologies to solve analytical and research problems.

47. Technologies for processing graphic information. Graphic editor.
48. Text and graphic editors.

PC-19. It is able to organize monitoring studies using systems for processing large amounts of data and artificial intelligence in professional activities.
PC-19.1 - software complexes for automatic management of veterinary documentation
49. Information. Measure and quality of information. Properties of information.
50. PC architecture. Principles of building a classic personal computer.
51. PC structure. Composition of the system (motherboard) board

PC-19.2 Master the skills of working with large amounts of veterinary documentation
52. Microprocessor: main components and their purpose
53. Clock generator. System bus.

PC-19.3 Possess knowledge in the field of artificial intelligence and data analysis
54. File structure of information.

2. METHODOLOGICAL MATERIALS DETERMINING PROCEDURES FOR ASSESSING KNOWLEDGE, ABILITIES AND SKILLS AND ACTIVITY EXPERIENCE CHARACTERIZING THE STAGES OF COMPETENCY FORMATION

Criteria for assessing students' knowledge during testing:

The test result is assessed on a percentage rating scale. Each student is offered a set of test tasks consisting of 25 questions:

- **Mark "excellent"**– 25-22 correct answers.
- **Mark "good"**– 21-18 correct answers.
- **Mark "satisfactory" –**17-13 correct answers.
- **Mark "unsatisfactory"**– less than 13 correct answers

Criteria for assessing students' knowledge when checking test papers:

- **Mark "excellent"**- the problem is identified and its relevance is justified; an analysis of various points of view on the problem under consideration was made and one's own position was logically stated; conclusions are formulated, the topic is fully disclosed, the scope is maintained; requirements for external design have been met, basic requirements for the abstract have been met
- Marked "good" - some shortcomings have been made. In particular, there are inaccuracies in the presentation of the material; there is no logical consistency in judgments; the volume of the abstract is not maintained; there are omissions in the design, there are significant deviations from the requirements for abstracting.
- Marked "satisfactory" - the topic is only partially covered; there were factual errors in the content of the abstract; there are no conclusions, the topic of the abstract is not disclosed
- Marked "unsatisfactory" - there is a significant misunderstanding of the problem or the abstract is not presented at all.

Knowledge criteria for the test:

- The "pass" grade must correspond to the parameters of any of the positive grades ("excellent", "good", "satisfactory").
- A "failed" grade must correspond to the parameters of an "unsatisfactory" grade.
- Mark "excellent" – all types of academic work provided for by the curriculum have been completed. The student demonstrates the correspondence of knowledge, skills and abilities to the indicators given in the tables, operates with acquired knowledge, skills and abilities, and applies them in situations of increased complexity. In this case, inaccuracies and difficulties may occur during analytical operations and the transfer of knowledge and skills to new, non-standard situations.
- Mark "good" – all types of educational work provided for by the curriculum have been completed. The student demonstrates the correspondence of knowledge, skills and abilities to the indicators given in the tables, operates with acquired knowledge, skills and abilities, and applies them in standard situations. In this case, minor errors, inaccuracies, and difficulties during analytical operations and the transfer of knowledge and skills to new, non-standard situations may be made.
- Mark "satisfactory" – one or more types of academic work provided for by the curriculum have not been completed. The student demonstrates incomplete compliance of knowledge, abilities, skills with the indicators given in the tables, significant mistakes are made, a partial lack of knowledge, abilities, and skills is manifested in a number of indicators, the student experiences significant difficulties in operating knowledge and skills when transferring them to new situations.
–
- The mark "unsatisfactory" means that the types of educational work provided for by the curriculum have not been completed. demonstrates incomplete compliance of knowledge, abilities, and skills with those given in the tables of indicators, significant errors are made, a lack of knowledge, abilities, and skills is manifested in a larger number of indicators; the student experiences significant difficulties in operating knowledge and skills when transferring them to new situations

6. ACCESSIBILITY AND QUALITY OF EDUCATION FOR PERSONS WITH DISABILITIES

If necessary, disabled people and persons with limited health capabilities are given additional time to prepare an answer for the test.

When carrying out the procedure for assessing the learning outcomes of people with disabilities and people with limited health capabilities, their own technical means may be used.

The procedure for assessing the learning outcomes of people with disabilities and people with limited health capabilities in the discipline provides for the provision of information in forms adapted to the limitations of their health and perception of information:

For people with visual impairments:	– in printed form in enlarged font, – in the form of an electronic document.
For people with hearing impairments:	– in printed form, – in the form of an electronic document.
For persons with musculoskeletal disorders	– in printed form, device: – in the form of an electronic document.

When carrying out the procedure for assessing the learning outcomes of disabled people and persons with limited health capabilities in the discipline, it ensures the fulfillment of the following additional requirements depending on the individual characteristics of the students:

a) instructions on the procedure for conducting the assessment procedure are provided in an accessible form (orally, in writing);

b) an accessible form for submitting assignments of assessment tools (in printed form, in printed form in enlarged font, in the form of an electronic document, assignments are read out by the teacher);

c) an accessible form of providing answers to assignments (written on paper, typing answers on a computer, orally).

If necessary, for students with disabilities and people with disabilities, the procedure for assessing learning outcomes in the discipline can be carried out in several stages.

The procedure for assessing the learning outcomes of disabled people and persons with limited health capabilities is permitted using distance learning technologies.