

AL-FARABI KAZAKH NATIONAL UNIVERSITY
Faculty of chemistry and chemical technology
Department of Analytical, colloid chemistry and technology of rare
elements

Final exam program for the discipline
IA 2221 Instrumental Analysis

Educational program:
6B07202 “Food chemistry and technology (NKU)”

Almaty 2022

Final exam program the discipline is compiled by Madi Abilev, PhD, senior lecturer of the department of analytical, colloid chemistry and technology of rare elements.

Reviewed and recommended at the meeting of the department of analytical, colloid chemistry and technology of rare elements
« 23 » September 2022, Protocol #2

Head of the department _____ A.M. Argymbayeva
(signature)

Introduction

Exam formats: synchronous.

Exam form: Written.

Exam platform: Univer.

Exam type: offline

Exam control – Lecturer.

The exam lasts: 120 minutes for 3 questions, 1 attempt.

On the exam in this discipline, the following types of questions are encountered

Questions on the application of knowledge, combined questions.

Topics for which tasks will be drawn up

1. Classification of instrumental methods of analysis
2. Spectroscopic methods. Atomic spectroscopy
3. The phenomenon of interference in atomic spectroscopy
4. Atomic fluorescence spectroscopy
5. X-ray spectroscopy.
6. Electronic spectroscopy
7. Molecular spectroscopy. Molecular absorption spectroscopy in the ultraviolet and visible regions
8. Infrared and Raman spectroscopy
9. Nephelometry and turbidimetry
10. Radioscopic methods of analysis
11. Chromatographic methods of analysis
12. Sensors
13. Mass spectrometry
14. Electrochemical methods. Potentiometry
15. Ammetry, voltammetry
16. Coulometry
17. Conductometry
18. Miniaturization and automation of chemical analysis
19. Hybrid methods of analysis
20. Modern trends in the development of instrumental analysis

Rules for conducting the exam form

The exam is scheduled. The lecturer uploads the developed examination questions to the Univer IS questionnaire (univer.kaznu.kz).

Lecturer:

1. Places in the Univer system, in the “Program of the final control on the discipline” tab, the document “Final control on the discipline” in PDF format, in which the following should be stated:

- rules for conducting the exam;
- evaluation policy;
- timetable;
- examination platform

2. The lecturer, without fail, informs the students where the rules of the final exam are located after the date of the exam is set in the schedule.

3. Provides time during the exam to prepare an answer.

4. Warns the student about the ban on the use of cheat sheets, telephones and other means.

5. Controls the process of preparing the student, making comments, if necessary, or canceling the student's answer (in case of gross violations of the rules of conduct on the exam, with the preparation of an act of violation). It is allowed for students to use a draft for compiling a summary of the answer.

6. After completing the scheduled exam, collect student responses and send them to the registrar's office.

Student instruction

1. 30 minutes before the start of the exam, all students enter the classroom. They show an identity card and sign in the exam attendance sheet, an exam ticket is obtained.

2. Before the start of the exam, they check the availability of a draft, a pen and other necessary items.

3. At the beginning of the exam, turn over the exam sheet and fill in the spine.

4. Students write down their answers to the exam questions on the provided answer sheet.

5. After completing the exam, they submit the completed examination sheet with answers to the lecturer on duty.

Evaluation policy

A student maximum scores 100 points for the exam. The maximum number of points for the first question is 30, for the second - 35, for the third - 35. Within 48 hours, the points scored by the students are put into the attestation sheet.

Recommended Literature Sources for Exam Preparation

1. S. S. Mahajan. Instrumental Methods of Analysis. - Popular Prakashan Limited, 2010 – 458 p.

2. D. Muralidhara Rao, A. V. N. Swamy, D. Dharaneeswara Reddy. Instrumental Methods of Analysis. - CBS Publishers & Distributors, 2020. – 384 p.

3. D. A. Skoog, F.J. Holler, S.R. Crouch. Principles of Instrumental Analysis. – Cengage, 2017.

4. F. Rouessac, A. Rouessac. Chemical Analysis: Modern Instrumentation Methods and Techniques. – Wiley, 2013.