Oral exam - the student takes an exam in the building in front of the examination committee according to the exam schedule by answering the questions on the ticket. The exam is monitored by a video camera.

TRADITIONAL ORAL EXAMINATION – ANSWERS TO QUESTIONS.
Conducted offline. The exam format is synchronous.

The process of passing an oral examination by a student involves **the creation of an examination paper for the student,** which must be answered before the examination committee.

EXAMINATION REGULATIONS

IMPORTANT – the exam is conducted according to a schedule that must be known to students and teachers in advance. This is the responsibility of the departments and faculty.

STUDENT

1. It is necessary to come to the building in advance and find an audience to take the exam.
2. Provide identification and sign the appearance form.
3. Enter according to your queue.
4. Take a ticket and prepare to answer the questions on the ticket.
5. The duration of preparation is determined by the commission (recommended 10 minutes preparation and 5 minutes response).
6. After preparation, the student defends his answers before the commission.

List of topics for the final exam in the discipline

1	Sets and basic operations on them. Power of the set. Finite and infinite sets.
2	Binary relations. Applying operations to binary relations.
3	Principles of counting. Inclusion-exclusion formula. Placements and combinations.
4	Number of injections, surjections, bijections on finite sets. Definitions. Method of mathematical induction.
5	Simple properties of divisibility. Integers modulo comparable. Chinese remainder theorem.
6	Multiplicative functions. Euler's and Fermat's theorems.
7	Basic concepts of graph theory. Metric characteristics of graphs.
8	Operations on graphs.
9	Internal graphs. Cycles. Bound graphs. Trees.
10	Matrices corresponding to graphs.
11	Planar graphs. Coloring graphs. Eulerian graphs.
12	Logic algebra functions. Basic equivalences. SKNF and SDNF.
13	Zhegalkin polynomials. Closed classes. Examples. Duality. Self-dual functions.

LIST OF RECOMMENDED BOOKS

1.   Kenneth Rosen: "Discrete Mathematics and Its Applications", 7th edition, 2012, McGrawHill. Press, 2009.

2.   Seymour Lipschutz, Marc Lipson: Discrete Mathematics. (Shaum's Outline), 4th edition, 2009, McGraw-Hill.

3.   David Guichard: "An Introduction to Combinatorics and Graph Theory", 2023

Internet resources

Available online: Additional educational material is available on your page on the website univer.kaznu.kz in the EMCD section.

Evaluation Criteria (Rating Scale):

«excellent» -	A	4,0	95-100
	A-	3,67	90-94
«good» -	B+	3,33	85-89
	B	3,0	80-84
	B-	2,67	75-79
	C+	2,33	70-74
«satisfactory» -	C	2,0	65-69
	C-	1,67	60-64
	D+	1,33	55-59
	D-	1,0	50-54
«unsatisfactory» -	FX	0,5	25-49

GRADING POLICY BAK/MAG/DOC STANDARD EXAM: ORAL

№	Criterion/score	Дескрипторы				
		Excellent	**Good**	**Satisfactory**	**Unsatisfactory**	
		90–100% (27-30 points))	**70–89% (21-26 points))**	**50–69% (15-20 points))**	**25–49% (8-14 points))**	**0–24% (0-7 points)**
1 question **30 point**	**Knowledge and understanding theories and concepts course**	An "excellent" grade is given for an answer that contains an exhaustive explanation of the question, a detailed argumentation for each conclusion and statement, is constructed logically and consistently, and is supported by examples from the developed classroom topics.	The grade "is given well for an answer that contains a complete but not exhaustive coverage of the issue, an abbreviated argumentation of the main provisions, and allows for a violation of the logic and sequence of presentation of the material. The answer contains inaccurate use of terms.	A "satisfactory" grade is given for an answer that contains incomplete coverage of the questions proposed in the ticket, superficially argues the main points, in the presentation allows for violations of the logic and sequence of presentation of the material, and does not illustrate theoretical points with examples from the developed class notes.	Incorrect coverage of the questions posed, erroneous argumentation, factual and verbal errors, assumption of an incorrect conclusion.	Ignorance of basic concepts, theories...; Violation of the Rules for final control.
2 question **30 point**	**Application of favorites methods and technologies to specific practical tasks**	Complete completion of the educational assignment, a detailed, reasoned answer to the question posed, followed by solving practical problems of the course;	Partial completion of the educational assignment, incomplete, sometimes reasoned answer to the question posed with an incomplete solution to the practical problems of the course; illiterate use of scientific language norms in the course;	The material is presented in fragments, in violation of logical sequence, factual and semantic inaccuracies are made, and theoretical knowledge of the course is used superficially.	An irrational method of solving a task or an insufficiently thought-out answer plan; inability to solve problems, perform tasks in general; making mistakes and omissions that exceeds the norm.	Inability to apply knowledge and algorithms to solve tasks; inability to draw conclusions and generalizations. Violation of the Rules for final control.

Exam papers consist of 3 questions. For correctly completed tasks, the maximum is 100 points, of which 30 points for the first question, 30 points for the second question, and 40 points for the third question.