APPROVED
at a meeting of the
Scientific Council
NJSC «Al-Farabi KazNU».
Minutes No.10 dated
May 23, 2022.

The program of the entrance exam for applicants to the PhD for the group of educational programs D130 – «Standardization and certification (by industry)»

1. General provisions.

1. The program was drawn up in accordance with the Order of the Minister of Education and Science of the Republic of Kazakhstan dated October 31, 2018 No. 600 "On Approval of the Model Rules for Admission to Education in Educational Organizations Implementing Educational Programs of Higher and Postgraduate Education" (hereinafter referred to as the Model Rules).

2. The entrance exam for doctoral studies consists of writing an essay, passing a test for readiness for doctoral studies (hereinafter referred to as TRDS), an exam in the profile of a group of educational programs and an interview.

Block	Points
1. Essay	10
2. Test for readiness for doctoral studies	30
3. Exam according to the profile of the group of the educational program	40
4. Interview	20
Total admission score	100/75

3. The duration of the entrance exam is 4 hours, during which the applicant writes an essay, passes a test for readiness for doctoral studies, and answers an electronic examination. The interview is conducted on the basis of the university separately.

2. Procedure for the entrance examination.

1. Applicants for doctoral studies in the group of educational programs D130 - «Standardization and certification (by industry)» write a problematic / thematic essay. The volume of the essay is at least 250-300 words.

2. The electronic examination card consists of 3 questions.

Topics for exam preparation according to the profile of the group of the educational program.

Discipline **1. «Quality management systems»**

Topic 1.1. Main objectives and goals of product quality management
Sub-topics 1.1.
The concept of quality.
The value of product quality for the consumer and the manufacturer.
Product quality indicators and the principles of their formation.
The problem of product quality and its connection with other problems of the market economy.
Topic 1.2. General principles of building quality management systems.
Sub-topics 1. 2.
Basic principles of managing various systems.
Stages of quality improvement as the basis for the formation of the principles of the quality management system.
Basic principles of building quality management systems.
The postulates of the concept of quality and the development of the company's policy in the field of quality.
Topic 1.3. Criteria for the effectiveness of quality management systems
Sub-topics 1.3.
General issues of evaluating the effectiveness of quality management systems.
Economic criteria for evaluating the effectiveness of quality management systems.
Methodology for evaluating the effectiveness of quality management systems of an enterprise (organization).
Assessment of the quality of innovative projects.
Topic 1.4. Composition of quality management subsystems and their formation.
Sub-topics 1.4.
Quality management system as a subsystem of enterprise management.
Product life cycle and the basic concepts of a quality management system.
Formation of quality management subsystems within the framework of comprehensive quality management.
Topic 1.5. Organization, verification, analysis, evaluation and certification of quality systems.
Sub-topics 1.5.
International standards ISO 9000 as the basis for the creation and development of quality management systems of organizations.
Organization of work on the creation of a quality system.
Development and implementation of the QMS.
Checking quality systems.

Discipline **2. «Statistical methods of control and management»**

Topic 2.1. Statistical methods of product quality control and management
Sub-topics 2.1.
Fundamentals of statistical analysis.
Statistical quality control.
Assessment of the level of product quality.
Ishikawa's causal diagram.
Pareto analysis.
Histograms.
Quality management by methods of statistical regulation of technological processes. Types and methods of statistical regulation of the quality of technological processes.

Statistical acceptance control based on an alternative attribute.
Statistical acceptance control on a quantitative basis.

Discipline **3. «Standardization and certification of products»**

Topic 3.1. Fundamentals of standardization. Methodological foundations of standardization.
Sub-topics 3.1.
The subject, objectives and structure of standardization.
Standardization in the conditions of developed market relations and the deepening of the processes of economic globalization.
Methodological foundations of standardization.Standardization theory.
Mathematical models and methods used in standardization theory.
The main goals, objects and methods of classification and coding in standardization.
Principles and functions of standardization.
Topic 3.2. Standardization tools.
Sub-topics 3.2.
National standards. Technical regulations.
Application of documents in the field of standardization. Types of standards.
Technical conditions.
Topic 3.3. Standard systems.
Sub-topics 3.3.
The system of legislative and regulatory acts in the field of technical regulation.
Economic and legal basis of standardization.
Structure of the standard technical regulations.
State control and supervision of compliance with technical regulations.
Topic 3.4. Economic aspects of standardization. Fundamentals of economic Metrology.
Sub-topics 3.4.
Economic and organizational bases of product quality management.
Economic bases of standardization.
Economic aspects of metrology.
Economic aspects of certification
Assessment of the competitiveness and technical and economic level of products.
Topic 3.5. International and regional cooperation in the field of standardization.
Sub-topics 3.5.
International Organization for Standardization Cooperation.
Regional standardization system of the European Economic Co-operation (EEC) countries.
International cooperation of the EEC countries. Directions of standardization development in the EEC.
Ensuring quality guarantees, safety of the traded goods and proper protection of consumer rights.
The use of interstate standards (GOST) developed at the site of the Interstate Council for Standardization, Metrology and Certification of the Commonwealth of Independent States countries for the implementation of the technical legislation of the EEMA.

Discipline **4. «Standardization and conformity assessment of technological processes»**

Topic 4. 1. Technical regulation
Sub-topics 4. 1.
Principles of technical regulation.
Legal basis of technical regulation. Technical regulations.
State control (supervision) of compliance with technical regulations.
Basic concepts in the field of conformity assessment. Objectives and principles of conformity assessment.

Voluntary confirmation of compliance. Mandatory confirmation of compliance.

Topic 4.2. Theoretical foundations of metrology.

Sub-topics 4.2.

Goals and objectives of metrology.
Physical quantities, their classification.
Measurement scales.
The system of units of physical quantities.
Measurement characteristics. Classification of measurements.
The method of performing measurements.
Measuring instruments. Classification of measuring instruments.
Standards. Metrological characteristics of measuring instruments.
Regulation of ensuring the uniformity of measurements. Forms of state regulation of ensuring the uniformity of measurements.
Verification of measuring instruments.
Calibration of measuring instruments.
Testing of reference materials or measuring instruments.
Metrological support.
Metrological organizations.

1. List of references

Main:

1. Тебекин, А.В. Управление качеством. - М.: Изд. Юрайт, 2011. – 371 с.
2. Ефимов В.В. Средства и методы управления качеством .- М.: КНОРУС, 2010. – 232 с.
3. Гугелев А.В. Стандартизация, метрология и сертификация: конспект лекций.- М.: Высшее образование, 2007.-210 с.
4. Аскаров Е.С. Стандартизация, метрология и сертификация: Учебное пособие. - Алматы: Экономика, 2011, 321 с.
5. Исследование систем управления: Михайлов Л.М., Мишин В. М., Сисюк А.Я. - М.: Издательство «Экзамен», 2009.- 189 с. (Серия «Учебное пособие для вузов»)
6. Леонов О.А., Темасова Г.Н.,Шкаруба Н.Ж, Экономика качества, стандартизации и сертификации. – М.: ИНФРА – М. 2014. 251с.
7. Райкова, Е.Ю. Стандартизация, подтверждение соответствия, метрология. М.: учебник, - М.: Издательство Юрайт, 2014. – 349с.
8. Метрология и технические измерения / Э.Г. Миронов, Н.П. Бессонов. - М.: КНОРУС, 2015. - 422 с.
9. Крохин В.В. Метрология: Учеб. Пособие для вузов. - М.: Логос, 2001. – 408 с.
10. Лифиц И.М. Основы стандартизации, метрологии, сертификации: Учебник.- М.: Издательство Юрайт, 2000. – 285 с.
11. Экономика качества, стандартизации и сертификации: Учебник. - М.: ИНФРА – М, 2014. - 251 с. + Доп. материалы {Электронный ресурс. Режим доступа http://www.znanium.com}- (Высшее образование).

Additional:

1. Аскаров Е.С. Управление качеством: учебное пособие. - Алматы: Юрист, 2009, 3-е изд.– 292с.
2. Агарков А.П. Управление качеством: Учебное пособие. - М.: Издательско-торговая корпорация «Дашков и К°», 2007. – 218 с.
3. Инновационный менеджмент предприятия: учебное пособие для студентов вузов / Базилевич, А.И.; под ред. Б.Я. Горфинкеля. - М.: ЮНИТИ – ДАНА, 2009.- 231 с.

4. Новиков А.М., Новиков Д.А. Методология научного исследования. - М.: Книжный дом, «ЛИБРИКОМ», 2010. – 280 с.

5. Фархутдинов Р.А. Производственный менеджмент: Учебник для вузов. 6-е изд.- СПб.: 2011. -496 с. – (Серия «Учебник для вузов»).

6. Стандарты качества окружающей среды: учеб. пособие/ Н.С. Шевцова и др.; под ред. проф. М.Г. Яковлева. - Минск: Новое знание; М.: ИНФРА – М, 2014. -156. (Высшее образование).