

AL-FARABI KAZAKH NATIONAL UNIVERSITY

**Approved by at the meeting
Scientific and Methodological Council
Kazakh National University
named Al-Farabi
Protocol № 6 from
« 22 » 06 2020 year.**

**PROGRAM
ENTRANCE EXAMINATIONS ON SPECIALTY
FOR ADMISSION TO DOCTORAL PHD OF SPECIALTY**

«8D05108- GEOBOTANIST»

ALMATY 2020

The program in accordance with the state standard of general education in the specialty «8D05108-Geobotany." The program constituted dr., professor N.M. Mukhitdinov, c.b. executive of assistant docent N.Z. Akhtayeva.

Программа рассмотрена на заседании кафедры биоразнообразия и биоресурсов
The program discussed at a meeting of the Department of Biodiversity and bioresources
Protocol № _____ from _____ 2020y.
Head of the Department _____ M.S.Kurmanbaeva

Endorsed by meeting of the bureau of the method of the Faculty of Biology and Biotechnology
Protocol № _____ from _____ 2020y.
The chairman method bureau _____ Urikova O.U.

Approved at a meeting of the Academic Council
Protocol № _____ from _____ 2020y.

The chairman of the Scientific Council,
Dean of the Faculty _____ B.K.Zayadan

CONTENT

1. Aims and objectives of the entrance examination in the specialty - deepening theoretical and practical knowledge in areas related to botanical research (geobotany, agriculture and forestry, environmental protection, etc.), due to the needs of the state and the market, scientific, practical and pedagogical activities institutions that train doctors by specialty - training of specialists with a high level of professional culture, including the culture of professional dialogue with civil position, ability to formulate and solve modern scientific and practical problems in science and industry, to teach in schools, successfully implement research and management activities in various organizations related to geobotanical research, conservation and the environment - providing basic knowledge and practical skills at the intersection of biology, chemistry, physics, mathematics, guaranteeing their professional mobility in the developing world live.

Form of entrance examination - combined written-oral examination. Examinees write their answers to the questions of the examination tickets for the answer sheets, answer oral examination committee. In the case of an appeal the basis for consideration are written records on the answer sheet.

2. Competence requirements for persons entering doctoral PhD

Preceding the minimum level of education for those wishing to learn educational doctoral programs - Masters.

The procedure for admission to doctoral citizens established in accordance with the Model Rules of admission to the organization of education, implementing professional training programs of postgraduate education. According to SES RK 7.10.028-2009.

3. Prerequisites educational program

Prerequisites:

1. Phytocenology
2. Biodiversity conservation and rational use of plant cover

4. The list of examination theme Discipline "Phytocenology"

1. The phytoceonosis as biological system, some features of the systems phytocenological level.
2. The phytoceonosis biocenosis, biogeocenosis facies ecosystems.
3. Bioenergy phytocenosis. Productivity of the community.
4. The cycles of batteries. Systematic approach to the analysis of phytocenosis. Classification phytocenoses.
5. Formation phytocenosis and relationships of its components. Environmental factors that determine the life of plants and plant communities. Classification of environmental factors. General regularities of the environmental factors on living organisms. Aus- and synecological optimum amplitude and range of the species. The interaction of environmental factors.
6. Laws of formation phytocenoses. Types of relationships of plants with each other (classification V. N. Sukachev, V. S. Ipatova and L. N. Kirikova, B. M. Mirkin). Competition. The role of competitive interactions in the formation of plant communities.
7. Interference of plants in phytocenosis. Amensalism: unilateral and mutual negative sredoobrazovanie, allelopathy.
8. Environmental and phytocenotic optimum form.
9. The study of relationships in the plant community. The influence of herbivores and parasites on plants and plant communities. Mutualistic relationship between plants and their consorts. Consorts role in shaping plant vegetation.
10. Cenopopulations. Coenopopulations density, methods of its determination. Accommodation species of plants on the territory. Of vitality (vitality) coenopopulations, methods of its determination. The age structure of populations. Developmental (or age) of herbaceous and woody plants as part cenopopulations. Types cenopopulations on their ontogenetic composition. The concept of

polnochlennosti and nepolnochlennosti cenopopulations.

11. Population (s) of saturation phytocenosis, quantitative saturation phytocenosis, the proportion cenopopulations.
12. The age structure cenopopulations.
13. Fitotsenotipy.
14. Structure phytocenoses (sinmorfologiya).
15. Longline phytocenosis mosaicism. The vertical structure phytocenosis. Causes of tiers.
16. Changes in the structure of phytocenoses time, seasonal variability.
17. Differentyear variability
18. Functional elements of structure phytocoenosis. (Synusia. Consortium). Sinuzialnaya phytocenoses structure. Principles and methods synusial. Horizontal structure (addition) phytocenoses. Types of addition phytocenoses. Variation pattern of vegetation V.I Vasilevich. Mosaicism phytocenoses its cause and severity in different types phytocenoses. Complexity of vegetation. The boundaries between phytocenoses. Phytotsenotichesky properties ecotones.
19. The essence of the concept of a continuum.
20. Leading factors distribution of plant communities.
21. On the main methodological approaches of studying the relationship of vegetation and environment.
22. Assess the environment for individual indicator species.
23. Evaluation of the environment on plant associations on - indicators.
24. Assess the environment in relation indicator groups phytocenoses classification.
25. biogeocenology - the science of biogeotsenozah their totality in the biosphere or biogeocentical land cover.
26. The object and purpose of biogeocenology, the history of ideas about biogeocoenose.
27. Geologic shell and the Biosphere lands on V.I. Vernadsky.
28. Concepts: biogeocentical cover (Sukacheva) epigenema (Abolin) fitogeosfera (Lavrenko) biogeocoenosis.
29. Biogeosphere, its properties and characteristics.
30. Biogeocoenosis - the unit cell of the biosphere.
31. The composition and interaction of the components biogeocoenose.
32. Structural and functional organization biogeotsenologicheskikh systems and its analysis.
33. Structure and function of the major components of land ecosystems, the mechanism of their relations and the results of the action in the overall system.
34. Vegetation as a component biogeocoenose.
35. Of autotrophic biota in ecosystems.
36. Phototrophic, their functions and features.

Discipline "Biodiversity conservation and rational use of plant cover"

1. Basics biocenotic relationships within ecosystems. Biocenosis. Autotrophic part of the biota in ecosystems. Phototrophs, their functions and features. Hemotrofy, their functions and features.
2. The vegetation, animals and micro-organisms as components of ecosystems. Vegetation as a component of the ecosystem (biogeocoenose). Animal population as a component of the ecosystem (biogeocoenose). Microorganisms as participants biogeocentical systems. Algae, bacteria, fungi, protozoa and their role in the ecosystem (biogeocoenose).
3. The atmosphere, hydrosphere and lithosphere as components of ecosystems. The soil as a component of the ecosystem (biogeocoenose) sushy. The main objectives of the study of soils in biogeocentical purposes. Features of the motion, the thermal regime and soil aeration. Interaction with other components of the soil ecosystem.
4. Problems of conservation of biological diversity.
5. Principles of monitoring studies on the conservation of biological diversity. Environmental assessment of the current state of biodiversity. Inventory of flora of a given region and protected areas

(national parks, nature reserves, wildlife sanctuaries, birezervaty). Protection of rare and endangered species. Red Data Book of Kazakhstan. Protection of the centers of origin of cultivated plants. Human activities and biodiversity.

6. National Strategy on the sustainable use of biological diversity. Aims and objectives of the strategy. Balanced use of biological resources. Organization of biological monitoring system. National Plan of Action for the Conservation and Sustainable Use of Biological Diversity.

7. Forest as the most important plant resources of the planet, measures for the protection, rational use and reproduction of forests, increase forest productivity.

8. Dendroflora and forest resources of Kazakhstan.

9. Household group of forest exploitation.

10. Features steppe biocenosis. Programs to combat desertification.

11. Pastures as producing ecosystems.

12. Rational use of arid rangelands.

13. Operation of pastures in Kazakhstan.

14. The reasons for the low stability of desert ecosystems.

15. Fundamentals of rational exploitation of desert phytocenoses worldwide.

16. Biosphere role, protecting and managing the meadows, wetlands, vegetation, mountainous countries.

17. Protected areas and biodiversity.

18. Convention of biological diversity.

19. Legislative Basics RK conservation of biological diversity.

20. Rational use of vegetation in Kazakhstan.

21. Protection of rare and endangered species.

22. Features of the Kazakhstan flora, the most valuable species.

23. Protection of the centers of origin of cultivated plants.

24. Exploitation of resources of wild useful plants (food, medicine, engineering), introducing them to the culture and the introduction. Repatriation.

25. Higher plants as a component biogeocoenose.

26. Animal population as a component biogeocoenose microorganisms as a component biogeocoenose.

27. The atmosphere as a component biogeocoenose sushi.

28. Soil as component biogeocoenoses sushi.

29. Stability of different ecosystems.

30. Dynamics biogeonezov, mezhbiogeotsenoznye communication and their mechanisms.

31. Problems biogeocenotic classification systems.

32. Types of ecosystems according to their origins.

33. Biogeocenosis variety of land.

34. biogeocentical basis for the creation of natural reserves.

35. Problems of protection and management of the individual components izpolzovaniya ecosystems.

36. Prospects for the development of Biosphere and Environmental Studies until 2015.

5. The list recommended literature

The basic literature:

1. Balandin S.A., Abramova L.I., Berezin N. Overall the basics of botany geobotany. M. Akademkniga. In 2006.
2. Lemeza N.A., Juice M.A Geobotany. .M. Acad High School, 2008. 258 P.
3. Mukhitdinov N.M Geobotany. Almaty, 2011 - 384 P.
4. Mirkin B.M., Naumova L.G., Solomech AI The Modern Science of vegetation. Textbook. Lotus M., 2001, 264.
5. B.A Bykov Geobotany. Alma-Ata. Science, 1978, 288.
6. Rabotnov G.A phytocenology. M. MSU, 1992, 3rd. Edition 352s.
7. Bigaliyev A.B Environmental and biodiversity conservation. Textbook. Almaty. In 2005.
8. Serebriakova TI, Voronin NS, Yelenevskaya AG, Bytychina TB, Shorin NI Savinyh NP Botany with the basics phytocenology, anatomy and morphology of plants. M., ICU "Akademkniga" 2006. 544 p.
9. M.M Gilyarov Population ecology of M. MSU, 1990.
10. Krasilov V.A Environment: Principles, Problems and Priorities. M. 1992.
11. National Action Programme to Combat Desertification in the Republic of Kazakhstan. MENR ENEP, Almaty, 1997.
12. Biodiversity Conservation in Central Asia. Kazakhstan. Ed. Bragina TM, Pereladova OB Almaty, 1997.
- 13 AS Stepanovskikh General ecology textbook for high schools M. UNITY. 2003 510c.
- 14 Mukhitdinov NM Biogeocenology negizderi. Оқу қыралы. Almaty. Publ. "Kazakh university." 2007. 140 P.
15. Anapa IM Course of lectures on "General Ecology" (Electronic resource). Karaganda State University. 13, 2008 lecture.
16. Pogosyan GP Lectures on "Environmental Biology (RE. Resources) Karaganda University 2008 25 Lecture
17. Atikeeva RI Course of lectures on biogeocenology (electronic resource) Karaganda State University 2009 15 lecture.
18. Pogosyan GP Course of lectures on the subject "Environment and Sustainable Development" (Elect resource) Karaganda State University 2009 15 lecture.

Supplementary literature:

1. Mirkin B.M., Naumov L.G Ecology. Textbook. UFA. Eastern University, 2004. 308 p.
2. Ipatov V.S Lirina DM Descriptions phytocenosis. Guidelines. St. Petersburg. 2008 71 p.
3. Mirkin B.M., Rosenberg GS phytocenology: principles and methods. Publishing House "Nauka". Moscow. 1978. 212 s.
4. Emelyanov LG., Ogureva GN Biogeographical mapping. Textbook. M. 2006. 132 p.
5. Mirkin B.M., Naumov LG Fundamentals of General Ecology. Textbook, 2005. 263 p.
6. Gilyarov MM Population ecology of M. MSU, 1990.
7. Odum Yu Ecology. M. 1986.
8. Dylis N.V Fundamentals biogeocenology. M. 1978.
9. Biosphere. M.1972.
10. M M Kamshilov Evolution of the Biosphere. M. 1974.
11. National Action Programme to Combat Desertification in the Republic of Kazakhstan. MENR ENEP, Almaty, 1997.
12. Ipatov V S, Mirin DM Descriptions phytocenosis. Guidelines. St. Petersburg. 2008 71 p.
13. Ponomareva II Plant ecology with the basics biogeocenology. M A, Education, 1978. 207 p.
14. A. Saltykov Bioecology. Textbook. Ulyanovsk, 2000.
15. I A Shilov Ecology. M. Graduate School. 2003. 512 s.

**EVALUATION CRITERIA ENTRANCE EXAMINATIONS
FOR ADMISSION TO DOCTORAL PHD OF SPECIALTY
8D05108 – GEOBOTANIST**

According to the program the ticket contains 3 questions, of which the first and the second - the theoretical and the third involves the solution of any problem. An evaluation of all of the stacks of points for each question. Maximum -100 points, the minimum (continuous) - 51 points.

1 question (theoretical) estimated as follows:

Excellent - 30 points (maximum)

Well - 26 points (maximum)

Satisfactory - 23 points (maximum)

Unsatisfactory - 15 points (maximum)

2 question (theoretical) estimated as follows:

Excellent - 30 points (maximum)

Well - 26 points (maximum)

Satisfactory - 23 points (maximum)

Unsatisfactory - 15 points (maximum)

3 question (practical) estimated as follows:

Excellent - 40 points (maximum)

Well - 35 points (maximum)

Satisfactory - 30 points (maximum)

Unsatisfactory - 20 points (maximum)

assessment	criteria for assessing:
Excellent	1 Dana competent, reasonable and complete answers to all theoretical questions 2 Practice fully implemented 3 Demonstrated horizons and creativity of the student 4 Theoretical postulates are supported by examples.
Well	1 The answers to all theoretical questions literate and correct inaccuracies is irrelevant or not supported by examples 2 Practical task is executed but there may be technical mistakes in the calculations.
Satisfactory	1 Dana substantially correct answers to all theoretical questions, but inaccuracies or in a logical sequence-of, no examples with errors in the wording 2 Practical task is executed correctly, or is not in full.
Unsatisfactory	1 The answer is not given, or contains serious errors. 2 Disrupted the logical sequence. 3 Practical task has been done.