

**Faculty of Ecology and Soil Science, specialty "Ecology" department full-time
**Questions of the Final State Examination for 2017/2018 on the subject
"General Ecology"****

Easy questions:

1. Properties of complex systems
2. The main characteristics of the levels of ecological systems (population, biocenosis, biogeocenosis, biosphere)
3. Terrestrial and aquatic ecosystems (comparative analysis)
4. Freshwater ecosystems (lentic and lotic ecosystems)
5. Marine ecosystems
6. The main factors of the environment and adaptation to them of organisms (climatic, edaphic, physical, chemical, biotic)
7. Basic living environments (terrestrial-air, water)
8. Basic living environments (soil, organism)
9. Population as a biological system (concept)
10. Homeostasis and population dynamics (population dynamics, demographic structure, density regulation)

More difficult questions:

1. Population properties and types of survival curves
2. The structure of the population (features of distribution, aggregation, isolation, territoriality)
3. Biocenosis as a biological system (concept, trophic and spatial structure)
4. Ecological niche and the Gause principle (concept, fundamental and realized ecological niche)
5. Ecological diversification (space, food, activity)
6. Numerical fluctuations and the main signs of r- and K-selection
7. Nutritional interactions in ecosystems (trophic structure)
8. Pyramids of numbers, biomass and energy in ecosystems
9. Types of interrelations between organisms (trophic, topical, phoretic, fabric)
10. The life forms of organisms (plants, animals)

Complicated questions:

1. The laws of Yu. Libikh and V. Shelford (the concept of limiting factors and ranges of tolerance)
2. Characteristics of the main limiting physical factors (temperature, light, ionizing radiation, water, biogenic elements, soil)
3. General classification of biotic interactions of organisms
4. Positive interactions of organisms (commensalism, cooperation, mutualism)
5. Predation, parasitism, allelopathy
6. Competition and coexistence of species
7. Ecotones and the concept of edge effect
8. Energy and material flow in ecosystems (primary and secondary productivity)
9. Characteristics of the main biomes of the planet
10. Ecosystem dynamics, development strategy (succession and climax)

Dean of the faculty:

Chairman of the Methodological Council:

Head of the department:

prof. N.T.Shamilov

assoc. prof. A.G.Huseynli

prof. N.A.Sadigova

**Faculty of Ecology and Soil Science specialty "Ecology" department full-time
Questions of the Final State Examination for 2017/2018 on the subject
"Human, environment and sustainable development"**

Easy questions:

1. Evolution of society in its relation to nature. Ecological niches of man
2. Demographic behavior and types of human migration
3. The ability to manage the demographic process
4. The concept of "eco-city" or city of the future
5. The concept of a biopositive country. Urban-ecological design program of the country and city
6. Harmful habits or diseases of civilization
7. Classification and definition of environmental disasters and crises
8. The effect of synergies and the integrated nature of environmental problems
9. Ecology of nutrition and food ration
10. Ecological and economic relationships in society

More difficult questions:

1. Characteristics of modern energy and the prognosis of energy of the future
2. Food security and the problem of hunger
3. Security problems in human ecology
4. Strategies for reducing waste and consuming goods
5. Human heredity, gene pool and the environment
6. Lifestyle and quality of life
7. Anthropogenic factors and public health
8. The concept of human adaptation and acclimatization
9. The impact of agricultural activities on the environment
10. Classification of human needs (social, biological, vital)

Difficult questions:

1. Natural - endemic diseases
2. The concept of sustainable development of society and modern directions
3. Differences in rural and urban lifestyles
4. Typology of the main types of pollution of the urban environment
5. Indicators of the health status of the population - mortality, malignant neoplasms, reproductive health, children's health
6. Public health and factors affecting it
7. Types and nature of environmental quality standards in human ecology
8. Epidemiological consequences of different forms of nature transformation
9. Regional patterns of the spread of disease. Natural - endemic diseases
10. Development of economic and legal mechanisms of rational nature management (ecosystem services)

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**Faculty of Ecology and Soil Science specialty "Ecology" department full-time
Questions of the Final State Examination for 2017/2018 on the subject
"Basics of geographical ecology"**

Light

1. The composition and cycle of water and its eco-geographic changes
2. The role of eco-geographic science in stable development
3. Climate significance and eco-geographic problems related to climate
4. Eco-geographic aspects of the use of resources of the Earth's crust
5. Eco-geographical aspects and dependencies of men's spread from nature
6. The point of the World Ocean in eco-geographical processes
7. Eco-geographic assessment of anthropogenic impact
8. Features of the biosphere and its eco-geographic content
9. The subject of geographical ecology and communications to the other sciences
10. Eco-geographic results of solar activity and its influence on the geographical envelope

Average

1. The place of productive forces in eco-geographical processes
2. Eco-geographical features of Biosphere Theory of V.Vernadsky
3. Geographical nature and structure of the environment
4. The role of the geographical environment in the development of society
5. Ecological essence of natural conditions and resources
6. Global and Regional Impacts to the World Ocean
7. Eco-geographical features of the Earth's spheres.
8. Eco-geographical values of the landscape and the results of its change
9. The role of atmospheric engineering and technology in changing and regulating of environmental processes
10. Eco-geographical assessments of geochemical dissemination of the Earth's crust

Complex

1. The place of the environment and its optimization in geography
2. Philosophical and ecological essence of the interaction of society and nature
3. Analysis of the ecological essence of systems and in the systematic approach
4. The eco-geographical essence and ideas of Chizhevsky in interaction of the Solar Activations
5. Eco-geographic essence in the use of natural resources
6. The organic world of land and its economic significance
7. Determination of the definition of common and distinctive features of natural conditions and resources
8. Analysis of the influence of natural conditions in ethno genetic processes
9. Ecological results of the impact of geological processes on ecological systems
10. What is a living matter, what is its ecological and eco-geographical essence?

Dean of the Faculty of Ecology and Soil sciences
Chairman of the Methodological Council:
Head of the department of Geoecology:
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prof.N.Shamilov
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**Faculty of Ecology and Soil Science specialty "Ecology" department full-time
Questions of the Final State Examination for 2017/2018 on the subject
"Ecological Chemistry"**

Easy

1. Subject and tasks of Ecological Chemistry
2. Pollution. Chemical pollutants of anthropogenic origin
3. Classification of chemical substances according to the effect on living organisms
4. Toxicity and carcinogenicity. Molar toxicity
5. Mechanism of toxic effects of chemicals. Metabolism and detoxification
6. Mechanism of carcinogenic effects. Organic carcinogens
7. The concept of the maximum permissible concentration and the maximum permissible level
8. Principles of normalizing the quality of the environment
9. Maximum allowable concentrations for air and water environments
10. Maximum permissible concentration of heavy metals in soil

Average

1. Chemical elements in living organisms. Distinctive features of macro- and microelements
2. Classification of chemical elements by V.I.Vernadsky and V.V.Kovalsky
3. The main chemical compounds of living organisms (water, organic and inorganic compounds)
4. Biochemical migration cycles of chemical elements. Anthropogenic migration
5. Migratory schemes of pollutants (first, second, third, fourth and fifth stages)
6. Biochemical role and toxic properties of the subgroup IA elements (Li, Na, K, Rb, Cs, Fr)
7. Biochemical role and toxic properties of the subgroup IIA elements (Be, Mg, Ca, Sr, Ba, Ra)
8. Biochemical role and toxic properties of the subgroup IIIA elements (B, Al, Ga, In, Tl)
9. Biochemical role and toxic properties of the subgroups IVA elements (C, Si, Ge, Sn, Pb)
10. Biochemical role and toxic properties of elements of the subgroup VA (N, P, As, Sb, Bi)

Difficult

1. Biochemical role and toxic properties of elements of the subgroup VIA (O, S, Se, Te, Po)
2. Biochemical role and toxic properties of elements of the subgroup VIIA (F, Cl, Br, I, At)
3. Biochemical role and toxic properties of the subgroup IIB elements (Zn, Cd, Hg)
4. Biochemical role and toxic properties of the subgroup VIB elements (Cr, Mo, W)
5. Biochemical role and toxic properties of the subgroup VIIB elements (Fe, Co, Ni)
6. Classification of organic compounds and the dependence of their toxic properties on the chemical composition and structure
7. Environmental problems caused by dioxins
8. Toxic properties of alcohols
9. Toxic properties of carboxylic acids and ethers
10. Toxic properties of amines, nitro compounds and alkylhydrazines

**Dean of the Faculty of Ecology and Soil Science
Head of the Department of Ecological Chemistry
Chairman of Methodol. Council**

**prof. N.T.Shamilov
prof. S.R.Hajiyeva
dos. A.G.Huseyinli**

**Faculty of Ecology and Soil Science specialty "Ecology" department full-time
Questions of the Final State Examination for 2017/2018 on the subject
"Industrial ecology"**

Easy

1. Purification of waters from radionuclides and heavy metals.
2. Classification of production and consumption wastes. Methods of neutralization of solid household waste.
3. Burial, thermal utilization and composting of solid household waste.
4. Cooling with open and closed cycle in heat power engineering. Impact on the environment.
5. Methods of liquidation of oil spills.
6. Deposits of natural gases. The problem of utilization of associated gases.
7. Wastes from the production of metallurgical and mining industries. Recycling.
8. The impact of vehicles on the environment. Traffic fumes.
9. Dependence of the composition of exhaust gases on the combustion of fuel. Norms are the maximum permissible concentrations.
10. Anti-knock additives, their influence on the environment.

Average

1. Principles of non-waste production. Resource-saving technologies.
2. Absorption - as a method for purification of waste gases. Cleaning of exhaust gases from solid particles.
3. Physicochemical methods of wastewater treatment
4. Solid and gaseous waste from thermal power stations. Recycling.
5. Classification of radioactive waste. Methods of their utilization.
6. Sources of radioactive contamination of the environment. Methods for the development of uranium deposits.
7. The impact of the extraction and transportation of hydrocarbons on the environment.
8. Assessing the environmental friendliness of technology. The coefficient of wastelessness.
9. The impact of the mining industry on the environment.
10. The impact of ferrous and non-ferrous metallurgy on the environment. Use of sludge

Difficult

1. Biochemical behavior of oil in an aquatic environment. Processes of self-purification of aquatic ecosystems.
2. Gas technogenic emissions, their physical and chemical transformations in the atmosphere.
3. Ozone, its kinds. Photochemical reactions in the atmosphere.
4. Reagent methods for purification of waste gases. Purification of gases from sulfur and nitrogen compounds.
5. Mechanical, biochemical and chemical methods of wastewater treatment.
6. Waste oil refining industry.
7. Characteristics of the petrochemical industry. Its impact on the environment.
8. The environmental impact of the nitrogen industry.
9. The environmental impact of the production of sulfuric acid. Waste production.
10. Wastes from the production of potassium and phosphorus fertilizers and their utilization.

**Dean of the Faculty of Ecology and Soil Science
Head of the Department of Ecological Chemistry
Chairman of the Teaching Methodological Council**

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