

Entrance tests

1. Ecology as a science. The place of ecology in the structure of human knowledge.
2. The principle of systematicity as a method of research in ecology.
3. Ecological systems, a subject of ecology. A definition and characteristics.
4. Classification of ecological systems.
5. The theory of stress and its importance for the analysis of environmental interactions.
6. Sustainability of ecological systems. Types of sustainability.
7. Biotic and abiotic factors of the environment. Limiting factors of the environment in the conditions of anthropogenic impact on ecological systems.
8. Biocenosis, species and spatial composition. The relationship of organisms in biocenoses. Ecological niches.
9. The concept of populations. Intraspecific and interspecific interactions. Homeostasis and ecological strategy of populations.
10. Ecological systems, structure, dynamics. Homeostasis of ecosystems. The impact of human activities on the development of ecosystems.
11. Circuits of substances in ecosystems; a cycle of carbon, oxygen, nitrogen, phosphorus. The consequences of the anthropogenic interference in natural cycles.
12. Energy flows in ecosystems. Trophic chains and levels. Ecological pyramids.
13. Chemical processes in the stratosphere. Formation and destruction of ozone. Ozone holes, causes of occurrence and consequences for the biosphere.
14. Chemical processes in the troposphere. Photochemical smog, causes and the building mechanism, the consequences for the biosphere.
15. Pollution of air by sulphur and nitrogen compounds. Acid rain. Consequences for the biosphere.
16. The role of soil in biospheric processes. Composition, structure and properties of mineral and organic substances of soil.
17. Ecological problems of the use of mineral fertilizers and pesticides.
18. The chemical composition of natural waters and the processes of its formation. The main components of the chemical composition of natural waters. Carbon dioxide balance of water.
19. Tasks and the structure of environmental monitoring. Organization of observations and monitoring of the state of the OS in the Russian Federation.
20. Environmental quality estimation. The main groups of standards and their content.
21. Air pollution observations organization in human settlements. Programs, methods and means of observation.
22. Water quality indicators and standards. Methods for the integrated assessment of the surface water pollution. The surface water pollution monitoring system, observational programs.
23. Features of programs and tasks of soil-ecological monitoring. Field and laboratory studies of soils.
24. Principles of selection of methods for neutralizing industrial wastes.
25. Construction of a landfill for solid waste disposal.
26. Ways to purify industrial emissions from suspended solids and aerosols.
27. Ways to purify industrial emissions from gaseous pollutants.
28. Physicochemical methods of wastewater treatment.
29. Biological methods of wastewater treatment.

30. The inventory of emission sources and pollutant emissions, methods of conducting.
31. Rules for the establishment and calculation of MPE of hazardous substances of industrial enterprises.
32. Calculation of the dispersion of pollutants. Taking account of the influence of various factors on the transport and dispersion of pollutants in the atmosphere.
33. Rules for the establishment and calculation of pollutant MPDs in water bodies.
34. Inventory of wastes. Principles of calculating the volume of waste products generation.
35. The environmental impact audit of the proposed activity, its legal framework, principles and the procedure.
36. Industrial environmental control of industrial enterprises, its tasks and content.
37. Culture formation and the increase of population.
38. Ecology and development of the human society.
39. The concept of human health and the possibility of using this concept in the analysis of the environmental situation.
40. The history of mankind and the history of the environmental management.
41. The concept of Russia's transition to sustainable development. The Doctrine of Ecological Safety of Russia.
42. The noospheric paradigm.