

LIST OF EXAMINATION QUESTIONS

Master's degree program 18.04.02 "Industrial Ecology and Cleaner Production"

1. Hypotheses of the origin of life on the Earth. The evolution of life.
2. Natural ecosystems' balance and its mechanisms. Homeostasis, succession and its types.
3. Types of ecosystems. Simplified anthropogenic ecosystems.
4. Global and regional environmental issues.
5. Environmental crisis and its origins. Scenarios to overcome the environmental crisis.
6. Sustainable development of the biosphere.
7. Influence of different economic activities to the environment. Classification of environmental pollutants.
8. General requirements in the field of environmental protection in the operation of enterprises. Industrial environmental monitoring.
9. Air pollutant emission inventory.
10. The main terms of industrial impact: pollutant, source of pollutants, source of emissions of pollutants. Classification of emission sources of pollutants.
11. Norming of pollutants in the ambient air. The concept of "maximum permissible concentration (MPC)". Types of MPC.
12. Dispersion of pollutants in the ambient air. The main factors affecting the dispersion.
13. The concept of maximum permissible emission of pollutants into the ambient air.
14. Management of water consumption at the enterprises.
15. Environmental protection in waste management. The waste management hierarchy.
16. Principles and tasks of monitoring ambient air quality and natural waters.
17. Monitoring of soil pollution by harmful substances of industrial origin.
18. Environmental management. Environmental mission, policy, and aims of a company/enterprise. Planning its environmental activities.
19. The family of international standards ISO 14000 in environmental management.
20. Requirements for the audit of environmental management systems in accordance with the international standard ISO 19011.
21. Environmental audit as an element of the environmental management system and its types.

22. Feasibility study of environmental projects.
23. Ecological taxes and fees.
24. The principle of continuous improvement in the environmental management system.
25. Facilities, installations and apparatus for the separation of coarse-dispersed impurities and suspensions from wastewaters.
26. Physico-chemical methods of wastewater treatment.
27. Aerobic biological wastewater treatment. The influence of external factors on the biological treatment process.
28. Anaerobic biological wastewater treatment. The influence of external factors on the process of biological treatment.
29. Purification of industrial gaseous emissions from harmful vapors and gaseous components. Adsorption method.
30. Ion exchange purification of natural and waste waters and installations for their implementation.
31. Baromembrane separation of contaminated liquids. Hyper and ultrafiltration separation mechanisms.
32. Water purification by membrane method.
33. Destructive methods of wastewater treatment: water treatment with various oxidizing agents, liquid-phase oxidation, electrochemical destruction.
34. Wastewater sludge treatment: general treatment methods and equipment.
35. Utilization and recycling of solid industrial and household waste.
36. Waste recycling and incineration plants, the main equipment of these enterprises.
37. Recycling of valuable components from solid industrial and household waste: the main methods
38. Installations and apparatuses for dry and wet gas cleaning from dust particles.
39. Thermal method of purification of industrial gaseous emissions from harmful vapors and gaseous components.
40. Concept of Zero waste.