Examination topics (Bioinorganic chemistry)

1. Classification of the elements according to their role in biological systems
2. The factors that determined the natural selection of essential elements
3. The basis of coordination chemistry; chelate effect
4. The hard-soft theory
5. The crystal field theory
6. Analytical metods for investigation of metal ion in biological system (the list of applied methods without details)
7. Amino acids, peptides and other small biomolecules as ligands
8. Membrane transport process: diffusion, passive and active transport
9. The role of potassium and sodium in the biological systems
10. The role of magnesium in human body and in the photosynthesis
11. The main roles of calcium in biological systems (with examples)
12. The role of iron in the transport and storage of oxygen
13. The role of iron in catalysis of redox processes: cytochromes and iron-sulphur proteins
14. The role of copper ion in the biological systems
15. Disorder of copper metabolism. Wilson and Menkes diseases.
16. The role of zinc in catalysis of acid-base processes (with examples).
17. The role of zinc in determination of protein structures (Cu,Zn-superoxide dismutase, zinc-finger proteins)
18. The role of metal ions in the brain
19. Application of metals in medicine
20. Application of metals in environment