1. Give the equilibrium constant for the reaction: $O_3 \leftrightarrow O_2$.
2. Characterize strong electrolytes and give 2 examples.
3. Approximate pH of the solution after dissolution of KCN in water. Explain by chemical reaction.
4. Write Nernst equation for the redox system Cu^{2+}/Cu^{+}.
5. Write the both: the components of phosphate buffer system and Henderson-Hasselbalch equation for this buffer system.
6. Write (by the formula) the reaction between methanol and acetic acid and give the name of the products.
7. Write the formulas of individual heterocycles:

   a) thiazole b) adenine
8. Using the Haworth formula of mannose explain term mutarotation.
9. Write the Haworth formulas of glucose 6-phosphate and D-galactosamine.
10. Describe the inulin and chitin (the linkage and monosaccharide composition).
11. Give at least two examples (with structures) of glycosaminoglycans.
12. Give the structure of at least 2 essential fatty acids. Specify, if they are ω-3 or ω-6 fatty acids.
13. Write the structure of eicosanoids precursor. Explain biomedical importance of eicosanoids.
14. Write the formula and name of two sulphur containing amino acids.
15. Write the formula of the amino acids:

    a) Tyr at pH>13 b) Lys at pH<3
16. Draw the structure of tripeptide Phe-Asp-Ala. What is the name of it?
17. Name at least two different examples of hemoprotein.
18. Write the structure of nitrogenous base that is complementary to guanine.
19. Give the structures of at least 2 pyrimidine bases present in RNA molecule.
20. Draw the general scheme of tRNA. Specify the nucleotide sequence of 3'- end.
21. Find the stoichiometric coefficients for the reaction: $Au + H_2SeO_4 \rightarrow Au_2(SeO_4)_3 + H_2SeO_3 + H_2O$, and write half reactions of oxidation and reduction.
22. Calculate the concentration of NaOH in mol/L if for the titration of 15 mL of sodium hydroxide solution was used 7.5 mL of hydrochloric acid with a concentration of 0.2 mol/L.
23. Calculate pH and pOH of the solution that contain 15 g HCl and 25 g HNO_3 in total volume of 5.4 L.
24. Calculate the molar concentration of 28 % KCl solution with density of $\rho = 1.12\ g.cm^{-3}$.
25. Calculate the molar ratio of component units of bicarbonate buffer if pH=7.38 and pK_A=6.1.