Subject closing topic list for pharmacy students

*In the oral exam two topics are randomly selected, one from the first (**1-13**) and the other from the second (**14-27**) part of the list. During preparation one topic (of your choice) needs to be written in detail while the other will be the subject of an oral exam. The final mark will be determined by the results of the two topics.*

1. Inorganic chemical considerations for the classification of Group I cations. Separation scheme for Group IA and B cations, chemical equations of reactions for the separation and identification of individual cations in this group.

2. Inorganic chemical considerations for the classification of Group II cations. Separation scheme for Group II cations, chemical equations of reactions for the separation and identification of individual cations in this group.

3. Inorganic chemical considerations for the classification of Group III cations. Separation scheme for Group III cations, chemical equations of reactions for the separation and identification of individual cations in this group.

4. Inorganic chemical considerations for the classification of Group IV cations. Separation scheme for Group IV cations, chemical equations of reactions for the separation and identification of individual cations in this group. Chemical equations of reactions for the identification of individual cations in Group V.

5. Classification of anions. Characterization of anions by their reactivity in acid-base, precipitation, complex formation and redox reactions. Chemical equations of anion identification reactions.

6. Chemical reactions in qualitative analysis. Selective, specific and group reactions. Identification tests, purity tests, content analysis. Ways of reporting the sensitivity of test reactions. Masking.

7. Rules of sampling for general and pharmaceutical analysis. Sample preparation for inorganic and organic analysis.

8. Statistical evaluation of the experimental data. Experimental errors. S/N. Statistical tests. Evaluation of the experimental results (types and possible errors of the calibration). Analytical performance parameters.

9. Quantitative description of acid-base equilibria. The Brönsted equation and its use.

10. Complex formation equilibria, apparent stability constants.

11. Precipitation equilibria. Factors influencing the solubility of precipitates.

12. Redox equilibria and redox titration curves.

13. Titration curves and their significant points: equivalent volume, end point, titration errors. Chemical end point detection in titrimetric analysis. Chemical requirements for reagents and standard solutions in titrimetric analysis.

14. Practice of acid-base titrations, possibilities of application.

15. Theoretical background and practice of complexometric titrations. The chelate effect.

16. Permanganometry.

17. Bromatometry and iodometry.

18. Analytical applications of precipitation reactions. Argentometric titration curves. Practice of argentometry.

19. Gravimetry (theoretical background, practical steps, examples).

20. Background of separation methods based on extraction. pH dependence of solute partitioning processes. Determination of metal ions by extraction. Distillation.

21. Theoretical basis of the formation of molecular and atomic spectra. Main application fields of the spectroscopic methods.

22. Construction of the UV-Vis spectrometers (constructions, main parts, principles).

23. The practice of UV-Vis spectroscopy (analytical procedures, application areas, basic law).

24. Theoretical basis of atomic spectroscopy. Main methods and applications of atomic spectroscopy.

25. Potentiometry and its application in analytical chemistry.

26. Conductometry and its application in analytical chemistry.

27. Theoretical basis of chromatography (types, principles, instrumentation (injection, separation, detection), band spreading, separation efficiency, evaluation of chromatograms).