

**Exam questions sub-questions for students of the Bachelor of Pharmacy program
in the Toxicological Chemistry II**

- 1** The specific features of chemical-toxicological analysis of narcotic and other psychotropic drugs. The main steps of analysis, the demands to this analysis, reference standard, basic solution, standard solution, working solutions, control and placebo samples, internal standards, the causes of error.
- 2** The general description of “Medicinal poisons”, their physical-chemical characteristics, ways of introduction in human body, absorption, distribution, accumulation, metabolism, elimination, toxicity, usage.
- 3** The general and specific methods of extraction of “Medicinal poisons”: Vasilieva’s, Stass-otto’s, Sshedzinskij’s, Kartashov’s, Valova’s, Popova’s, Kramarenko’s, Solomatin’s, Izotov’s methods. Possible compounds in Acid-chloroform and basic-chloroform extracts. The extraction steps, and factors affecting on extraction efficacy. Purification and concentration of received samples.
- 4** Principal chart of qualitative and quantitative determination of “Medicinal poisons”. Screening of “Medicinal poisons”. Chemical, physical-chemical and pharmacological methods of analysis. Qualitative methods of analysis.
- 5** Acid, neutral and weak basic “Medicinal poisons”. The chemical-toxicological analysis of the agents of acid character. The derivative of Salicylic acid, their physical-chemical properties, usage, toxicity, toxicokinetic, the specific features of extraction, identification and qualitative determination.
- 6** The derivative of Barbituric acid, their physical-chemical properties, usage, toxicity, toxicokinetic, the specific features of extraction, methods of analysis.
- 7** The sample selection and preparation, description of biological materials, interpretation of received data.
- 8** Synthetic compounds of basic character, “Medicinal poisons”. 1.4-benzodiazepines, para-aminobenzoic acid and phenothiazines derivatives’ usage and toxicity. Extraction, and methods of analysis.
- 9** Natural compounds of basic character, “Medicinal poisons”. Chemical-toxicological analysis of alkaloids. Alkaloids’ usage, physical-chemical properties, toxicokinetic and toxicity. Direct chemical-toxicological analysis of alkaloids.
- 10** Immunoassay method in analytical toxicology.
- 11** Opiates – Morphine, Codeine, Dionine, Heroin. Their description and chemical toxicological analysis.
- 12** The express analysis of narcotic and other psychotropic drugs
- 13** Opioids – Methadone, Tramadol, Buprenorphine, Fentanyl. Their description and chemical toxicological analysis.
- 14** Chromatographic methods of analysis in chemical-toxicological analysis. Their importance in separation, identification and quantitative determination of narcotic, other psychotropic agents and “Medicinal poisons” analysis.

- 15 The principles of Good Laboratory Practice (GLP) and its importance in chemical-toxicological laboratory work. Determination of the quality of laboratory reagents.
- 16 "Medicinal poisons" the group of agents the isolation of which are done with polar solvents. The general methods of extraction. Vasileva's method of extraction with acidized (oxalic acid) water.
- 17 "Medicinal poisons" the group of agents the isolation of which are done with polar solvents.
- 18 The general methods of extraction. Stass-Otto's method of extraction with acidized (oxalic acid) ethanol.
- 19 The direct and indirect methods of analysis of acid -chloroform extract: determination of Salicylic acid
- 20 Thin Layer Chromatography screening of Salicylic acid
- 21 The direct and indirect methods of analysis of the acid-chloroform extract: determination of Barbituric acid derivatives.
- 22 The direct and indirect methods of analysis of the acid -chloroform extract: determination of pyrazolone derivatives (antipyrine, amidopyrine, analgene).
- 23 The 1.4-benzodiazepines test of the basic-chloroform extract by spectral methods of analysis.
- 24 The alkaloids test of the basic-chloroform extract:
Caffeine determination
- 25 The alkaloids test of the basic-chloroform extract:
 1. Identification of chinoline derivatives
 2. Identification of isochinoline derivatives
- 26 The phenothiazine test of the basic-chloroform extract by direct and indirect methods of analysis.
- 27 Quantitative analysis of "Medicinal poisons" (aminasine and novocaine) in biological material.
- 28 Final discussion of the done practical works