

№	Exam questions sub-questions for students of the Bachelor of Pharmacy program in the Pharmaceutical Chemistry I
1	The goals and objectives of pharmaceutical chemistry. The place of pharmaceutical chemistry among the complex of pharmaceutical sciences. The main historical stages of the development of pharmaceutical chemistry; methodological backgrounds and principals of the classification of medicinal products.
2	The development of the chemistry of medicinal substances. The sources and methods of obtaining medicinal substances; standardization of medicinal products. GMP, ISO and quality of medicinal products. The validation of medicines` quality assurance processes; influence of packaging materials on the medicinal products.
3	The rules of the state registration and expertise of the medicinal products. The State regulations and principles of the quality regulation of the medicinal products. The organization of the quality control of the medicinal products. Pharmaceutical analysis - physical and chemical methods of the analysis of the medicinal products.
4	Pharmaceutical analysis. Optical, chromatographic, electrochemical, spectrometric methods of analysis of medicinal products.
5	Stability and shelf-life of the medicinal products. The concept of the pharmacokinetics.
6	Inorganic medicinal products, distilled water, water for injection, medicinal oxygen. Preparations of hydrogen peroxide.
7	Halogens and their compounds with alkali metals. Sodium hydrocarbonate. Lithium carbonate.
8	Sodium thiosulfate, sodium nitrite. Sodium fluoride. Calcium and magnesium compounds
9	Barium sulfate, boron compounds, aluminum, bismuth, zinc, silver and copper compounds.
10	Iron compounds, complex compounds of platinum, complex compounds of gadolinium, radiopharmaceutical preparations.
11	Organic medicinal products. Methods of analysis and particularities of standardization of organic medicinal products.
12	Acyclic alkanes, their halogen and oxygen containing compounds; alcohols, simple ethers.
13	Complex ethers, carbohydrates, monosaccharides and polysaccharides.
14	Carboxylic acids and their derivatives; lactones of unsaturated polyoxy carboxylic acids. Urethanes, ureides. Aliphatic amino acids.

15	Introduction of the rules of working in the laboratory of pharmaceutical chemistry, safety techniques, laboratory vessels and equipment
16	Identification reactions of inorganic medicinal products (ion reactions)
17	Preparation of etalon solutions of ions. Determination of permissible limits of impurities
18	Preparation of etalon solutions for color and transparency determination, study of comparative methods
19	Preparation of titration solutions, installation of the titer
20	Analysis of distilled water
21	Analysis of hydrogen peroxide
22	Analysis of sodium hydrocarbonate or lithium carbonate
23	Analysis of sodium chloride, sodium bromide or potassium iodide
24	Analysis of magnesium sulfate
25	Analysis of calcium chloride solution for injections
26	Analysis of ethyl alcohol
27	Analysis of glucose
28	Analysis of calcium lactate or calcium gluconate
29	Analysis of ascorbic acid