MINISTRY OF EDUCATION AND SCIENCE OF THE KYRGYZ REPUBLIC

MINISTRY OF HEALTH OF THE KYRGYZ REPUBLIC

I. K. AKHUNBAYEV KYRGYZ STATE MEDICAL ACADEMY

«Approved»

Rector of KSMA, doc. of med. sciences, prof.

_____Kudaibergenova I.O.

«_____»_____2018

WORKING PROGRAM

GRADUATES STATE FINAL CERTIFICATION (ATTESTATION)

Direction of training (specialty) 560005 “Pharmacy”

Graduate qualification (degree) - Specialist (Pharmacist)

Form of study - full-time

The complexity of the MEP – 300 credits

Bishkek 2018

compiled on the basis of	State Educational Standard of Higher Professional Education in the specialty "Pharmacy" №1179 approved on 15.09.2015 and the approved curriculum	
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The program was discussed and approved at the meeting	EMPC in specialty "Pharmacy" Protocol № from _____ 2018	
The program was approved at the meeting	MEMC Protocol №_____from 18.12.2018	

Abbreviations and designations.

In this program of the state final attestation, the following abbreviations are used:

HPE - Higher professional education;

SC(A)C – State Certification (Attestation) Commission

SFC(A) –State Final Certification (Attestation)

SES – State Educational Standard;

MEMC – Main educational and methodological committee

DDS and ME – Department of Drug Supply and Medical Equipment

IC – Instrumental competencies;

SCC – Students' choice courses

MP – Medicinal product

MD – Medical devices

ND – Normative document

GSC (SC) – General scientific competencies;

MEP – Main educational program;

PC – Professional competencies;

SPGCC – Socio-personal and general cultural competencies.

EMD – Educational and methodological department;

EMPC – Educational and methodological profile committee

EFF – Evaluation funds fund

FP – Pharmaceutical products

CDCS and and PP – Center for the development of clinical skills and prod. practice

1. GENERAL PROVISIONS

The final certification tests are designed to determine the graduate practical and theoretical readiness to perform professional tasks set by the state educational standard.
The certification tests, which are part of the graduate state final certification, fully correspond to the main educational program in the specialty 560005 "Pharmacy", which the graduate mastered during the training.

1.1. **The aim** of the I. K. Akhunbayev State Medical Academy (KSMA) graduate SFC is to establish the compliance of knowledge formation, skills and abilities level achieved as a result of mastering the educational professional program with the requirements of the state educational standard.

The SFC is for determining the theoretical and practical readiness of a graduate to perform professional tasks and types of professional activities, to assess the formation of general cultural competencies (OC), social and personal (SPC), instrumental (IC) and professional competencies (PC) provided by the State Educational Standard of Higher Education and the main educational program in the specialty "Pharmacy".

1.2. The SFC goals are:

- determination of the graduate training with the requirements compliance of the educational standard in specialty of "Pharmacy»;
- making a decision on the qualifications assignment based on the state final certification results and the corresponding state diploma issuance of higher professional education to the graduate;
- development of recommendations for improving the training of graduates.

1.3. The State final certification is guided in its activities:

- The Law of the Kyrgyz Republic"About Education" of April 30, 2003 (with subsequent amendments);
- The Regulation on the educational organization of Higher Professional education of the Kyrgyz Republic, approved by the Kyrgyz Republic Government Resolution #53 of February 3, 2004;
- The Regulation on the final state certification of higher educational institutions graduates of the Kyrgyz Republic, approved by the Kyrgyz Republic Government Resolution of 29.12.2012 #346;
- The State Educational standard of higher professional education in the field of training (specialty) 560005 "Pharmacy", approved by the order of the Ministry of Education and Science of the Kyrgyz Republic dated September 15, 2015 No. 1179/1.
- Regulations on the final state certification of KSMA graduates, approved by Order #137 of 24.05. 2018.

2. MEMBERS OF THE STATE ATTESTATION COMMISSION

The SFC is conducted by the State Attestation Commission (SAC), which ensures that each of its stages is carried out.

2.1. The SAC consists of the chairman and at least 4 members of commission. The chairman, who organizes and controls the activities of all examination committees, ensures the unity of the requirements for graduates, heads the SAC. The chairman of the SAC is a person who does not work in the KSMA, from among the leading specialists (professors, doctors of science) of the corresponding profile, and in their absence – candidates of science or major specialists of organizations, institutions that are consumers of personnel in this profile.

The SAC is formed from the teaching staff of the KSMA, as well as persons invited from health organizations. Members of the SAC can be: the head of the department and employees of the graduating departments with a degree; chief specialists of the Ministry of Health of the Kyrgyz Republic, the Mandatory Health Insurance Fund under the Government of the Kyrgyz Republic, the Department of Drug Supply and Medical Equipment of the Ministry of Health of the Kyrgyz Republic, practitioners of the pharmaceutical sector with experience.

2.2. The main functions of the State Attestation Commission are:

- control over the preparation of examination, test and practical questions, which are approved by the EMD and the MEMC of the KSMA;
- comprehensive assessment of the level of graduate training and the compliance of his training with the requirements of the state educational standard of higher education and qualification characteristics in the specialty 560005 " Pharmacy»;
- making a decision on the assignment of qualifications based on the results of the SFC and the issuance of a corresponding diploma of higher education to the graduate;

- development of recommendations for improving the quality of professional training of specialists based on the analysis of the results of graduates certification.

2.3. For the period of the SFC, to ensure the work of the state attestation commission, the rector appoints the secretary of the commission from the teaching staff, researchers or administrative employees of the KSMA. The secretary of the SAC keeps the documents of meetings, submits the necessary materials to the appeal commission.

2.4. The staff of the appeal commission is formed from KSMA teaching staff and that are not included in the state attestation commissions.

The graduate can file an appeal application addressed to the SAC chairman on the certification test passing day, if:

- there are incorrect questions, their going beyond the scope of the program, errors in the answers of the tasks and test questions;
- violation of the SAC of the established procedure for conducting State certification;
- circumstances that prevent an objective assessment of the SAC work.

Dissatisfaction with the graduate level of the received assessment can not be the basis for an appeal.

The Appeal Commission, at the discretion of the chairman or deputy, holds a meeting of the KSMA SAC members in the presence of the graduate. If the graduate does not appear without a documented valid reason, the application is rejected.

An additional test of the graduate on the work materials and the exam is not provided. As a result of the appeal, the assessment can be changed (increased or decreased) by a commission and is drawn up by a protocol signed by the chairman and members of the SAC.

3. THE PROCEDURE FOR STATE FINAL CERTIFICATION CONDUCTING

The procedure for state certification tests conducting is developed by the issuing departments on the basis of the above regulatory documents (p.1. 3.) and students should be informed no later than six months before the start of the SFC.

The state exam is conducted according to the program approved by the rector of KSMA, which contains a list of questions to be submitted for the state exam, and recommendations for students to prepare for the state exam, including a list of recommended literature for preparing.

Students should be informed about the program of the state final certification, including the programs of the state examinations, the criteria for evaluating the results of passing the state examinations approved by the rector of the KSMA, as well as the procedure for filing and considering appeals no later than six months before the start of the state final certification.

Before the state exam, students are informed on the issues included in the program of the state exam.

Persons who have successfully completed the full development of the main educational program in the specialty are allowed to the final state tests, which are part of the state final certification.

Examination, test and practical questions are submitted to the EMD 30 days before the start of the SFC.

Students should be informed about the schedule of state examinations is approved by the rector no later than one month before the start of the state certification.

After the students complete the theoretical training in the main educational program, the dean's office prepares the following documents:

- order on graduates admitted to state exams – no later than two weeks before the exams are held;
- the credit book of each student (submitted to the executive secretary of the SAC);

All results of the state certification tests are announced on the day of its implementation.

Students who do not pass the SFC due to non-attendance at the state certification test for a disrespectful reason or in connection with the "unsatisfactory" rating are expelled from the KSMA with the issuance of an academic certificate.
Repeated passage of the SFC is allowed no earlier than three months and no more than five years after passing the final state certification for the first time.
A graduate who has not passed the SFC for a valid reason (for medical reasons or in other documented exceptional cases) is given the opportunity to pass the final certification tests without being expelled from the university.
All decisions of the SAC are formalized by protocols. The commissions meetings protocols are signed by the chairman, members of the SAC and the secretary of the State Attestation Commission. The commissions' meetings protocols are kept in the archive of the KSMA.
Subject to successful completion of all the established types of final certification tests included in the state final certification, the graduate is assigned the appropriate professional qualification and is issued a state-issued diploma of higher pharmaceutical education. The result of the SFC work is annually reported to the Academic Council of the KSMA.
In connection with the implementation of the continuous higher, postgraduate and additional professional education concept, the SFC should take into account that the graduate is a specialist who has a high-quality fundamental training, but at the same time has only the initial experience of its application in practice. Therefore, the quality criterion of higher pharmaceutical education is to determine the ability of a graduate to apply the basic concepts, provisions of all disciplines of the curriculum as a methodological, theoretical and technological means of substantiating and performing targeted types of cognitive and professional activities at the stages of his further study and work.

4.0 PROFESSIONAL READINESS OF A UNIVERSITY GRADUATE IN THE SPECIALTY 560005 " PHARMACY»

4.1. A graduate who has mastered the main educational professional program in the specialty 560005 "Pharmacy"should know:

Pharmacy Management and Economics

To know:
- the structure of the health care organization and financing modern system in the Kyrgyz Republic;
- fundamentals of the Kyrgyz Republic legislation on the protection of citizens ' health and ensuring sanitary and epidemiological well-being in the country;
- principles of relations legal and state regulation in the field of medicines circulation;
- the main regulatory and legal documents in the field of medicines circulation;
- the state system structure and functioning of medicines quality control, effectiveness and safety;
- legal, legislative and administrative procedures and policies related to all aspects of pharmaceutical activities;
- the system of works and services public procurement;
- fundamentals of good pharmaceutical practice standards – GxP-Standards;
- fundamentals of foreign economic activity and organization of pharmaceutical products wholesale trade;
- fundamentals of the organization of insurance medicine in the Kyrgyz Republic, the principles of pharmaceutical organizations work for the implementation of state programs to provide health care to the population, including preferential categories of citizens;
- the basic principles of state regulation and the pricing process for pharmaceutical products at all stages of the goods movement;

- the procedure for forming a distribution network (retail and wholesale) in the pharmaceutical market;
- principles of pharmaceutical organizations business processes audit and management;
- fundamentals of the drug provision organization for outpatient and inpatient patients, including on preferential terms;
- fundamentals of pharmacoeconomics, methods of ABC-VEN and ABC-XYZ-analyses in the pharmaceutical organizations activities;
- organization of medicines various groups storage in pharmaceutical organizations, medical products and other products of the pharmacy range;
- the procedure for the medicines release from the pharmacy to the population and health care organizations (PH);
- rules for conducting pharmaceutical expertise of prescriptions and requirements from the PH;
- organization of manufacturing in the form of intra-apical preparations and according to the PH requirements of medicines in pharmacy organizations;
- maintenance by pharmaceutical organizations accounting records of the wholesale and retail level;
- reporting methods for internal and external users of accounting information;
- basic principles of accounting for inventory items, cash and settlements;
- rules for accrual, deduction and deduction from wages;
- the main forms of non-cash payments for goods and services;
- tax systems of pharmaceutical organizations;
- methods of pharmaceutical organizations (accounting, statistical, tax) drawing up external reports;
- methods of pharmaceutical organizations main performance indicators financial analysis;
- fundamentals of analysis and planning of the pharmaceutical organizations financial and economic activities main economic indicators;
- fundamentals of the pharmaceutical organizations economy;
- methods and techniques of conducting information work among various groups of pharmaceutical information consumers;
- basics of promoting a healthy lifestyle;
- methods and techniques of conducting sanitary and educational work;
- approaches to solving professional problems, taking into account the bioethical aspects of the pharmacist's activity;
- fundamentals of pharmaceutical ethics and deontology.

Be able to:
- use the provisions of regulatory and legal documentation in the field of medicines circulation and the data of reference and scientific literature to solve professional problems;
- to carry out information, educational and sanitary-educational work;
- organize wholesale and retail trade of medicines and pharmacy products;
- organize the medicines production and quality control in the conditions of pharmaceutical production and pharmacies, taking into account the requirements of good pharmaceutical practices;
- follow the rules for handling toxic, narcotic, psychotropic substances, ethyl alcohol and properly draw up documentation on their subject-quantitative accounting;
- develop accounting policies, keep records of inventory items, cash and settlements, and prepare reports for internal and external users of accounting information;
- conduct inventory of inventory items, cash and settlements;

- conduct financial and economic analysis, analysis of the main performance indicators of pharmaceutical organizations;

- conduct an analysis of the state of the property and obligations of the pharmaceutical organization, assess the degree of risk of entrepreneurial activity;

- carry out pharmaceutical assessment of prescriptions and requirements-invoices, to dispense medicines to outpatient and inpatient patients;

- determine the cost of finished medicines and medicines of individual manufacture;

- keep accounting of the recipe in the relevant documentation;

- conduct subject-quantitative accounting of medicines in pharmaceutical organizations;

- keep accounting of preferential and free provision of medicines to the population;

- arrange documents for conducting of laboratory and packaging work;

- select a supplier, enter into supply contracts taking into account the methods of franking and draw up documentation on the claim work;

- register orders for the supply of pharmacy products;

- forecast and plan the economic indicators of the pharmacy;

- analyze inventory items and determine the sources of their financing;

-navigate the information flows of professional information about medicines;

- organize the storage in pharmaceutical organizations of various groups of medicines, medical products and other products of the pharmacy range;

- organize the storage of medicines manufactured in pharmacy organizations in accordance with their physical and chemical properties and period of storage;

- use ABC-VEN and ABC-VZ analyses in the activities of medical and pharmaceutical organizations;

- implement measures to comply with the sanitary regime and pharmaceutical order in the pharmacy organization;

- observe the principles of ethics and deontology, bioethics in dealing with medical and pharmaceutical workers, consumers.

To master:

- regulatory and legal documentation regulating the circulation of medicines;

- normative, reference and scientific literature for solving professional problems;

- the principles of rational organization of workplaces of pharmacy workers, including the use of equipment and facilities;

- rules and procedures for conducting pharmaceutical expertise of prescriptions and requirements-invoices, dispensation of medicines to outpatient and inpatient patient

- methods of organizing intra-pharmacy quality control of medicines;

- the rules and procedure for conducting pharmaceutical expertise of prescriptions for programs of preferential drug provision and distribution of medicines under preferential prescriptions;

- skills of organizing subject-quantitative accounting in a pharmacy organization;

- skills of registration of medicines for release, including those made extemporally;

- the basics and principles of compliance with the procedure for conducting and documenting inventory;

- skills of compliance and control of the pharmaceutical order and sanitary regime in the pharmacy organization;

- methods and techniques of accounting of inventory items;

- skills in organizing and conducting accounting of various operations in a pharmacy organization: accounting for labor and wages, conducting cash transactions, the procedure for non-cash payments with organizations, settlements with customers, accounting for circulation costs;

- methods of financial and economic analysis of the main indicators of pharmacies;

skills in the formation of prices for medicines and other pharmaceutical products;

the skills of organizing the proper storage, accounting of drugs, including narcotic, psychotropic drugs and precursors;

- the procedure for carrying out work in the field of licensing, conformity assessment, registration of medicines and pharmaceutical products;

- ABC/VEN and ABC/XYZ analysis methods;

- rules and procedures for participation in public procurement;

- rules and procedures for the organization of public procurement of medicines in healthcare organizations;

- rules and procedures for the organization of wholesale and retail sales of medicines and pharmaceutical products**.**

Drug technology

To know:

- achievements of pharmaceutical science and practice, concepts of pharmacy and medicine development at the present stage**,**

- the biopharmaceutical concept of drug technology, the influence of pharmaceutical factors (the type of dosage form, the particle size of drugs, the physical and chemical properties of drugs and excipients, the technological operations used, etc.) on the bioavailability of drugs,

-fundamentals of optimizing the technology of finished dosage forms based on the biopharmaceutical concept;

- information sources of reference, scientific, and normative nature, **- pharmaceutical procedure in accordance with the applicable tax laws,**

- the main regulatory documents related to the production, quality control, distribution, storage and use of medicines, medicines and medical products,

- the main provisions of the standards of good pharmaceutical practices - GxP-standards (international, domestic, standards in the territory of the Customs Union: GLP, GCP, GPP, GMP, etc.);

- structure and significance of pharmacopoeia in the technology of dosage forms;

- rules and norms of the sanitary and hygienic regime, methods of sterilization,
- rules for ensuring aseptic conditions for the manufacture of medicines,

- pharmaceutical procedure in accordance with the applicable tax laws,

- general principles for the selection, evaluation of the quality and operation of technological equipment (filtration plants, grinding machines and machines, sieving plants, plants and devices for sterilization, etc.),

- fundamentals of environmental safety of production and use of medicines, safety regulations, labor protection rules.

Be able to:

- independently work with scientific and technical literature, regulatory documents, pharmacopoeia articles, reference materials for solving professional problems;

- organize and ensure sanitary conditions, aseptic manufacturing conditions, obtaining purified water and for injection, its collection, storage and use;

-carry out technological expertise of the recipe, identify physical-chemical, chemical incompatibility, suggest solutions and solve the problem of incompatibility, use rational ways to prevent undesirable interactions;

-check the dose, taking into account the age and weight of the patient, as well as the compliance of the prescribed amounts of narcotic substances with the permissible norms of distribution;

- equip technologists ' workplaces and production facilities with modern devices and equipment and ensure their proper operation;

-choose the most effective and rational dosage forms and therapeutic systems based on the modern biopharmaceutical concept;

- take into account the influence of pharmaceutical factors (the type of drug therapy, the particle size of medicinal substances, the qualitative and quantitative composition of explosives, the technological process and devices, etc.) on the quality and bioavailability of the dosage form;

- to make LP according to individual prescriptions, industrial regulations and other regulatory documentation in the conditions of pharmacies, small-scale production;

- produce concentrates, semi-finished products and preparations in the form of intra-pharmacy preparation and evaluate their quality;

- solve the problems of physico-chemical, structural-mechanical, antimicrobial stability of dosage forms;

- to implement in practice the types of intra-pharmacyl control;

- conduct research on the improvement of medical devices and their manufacturing technology, work in contact with doctors;

- analyze the identified cases of unsatisfactory manufacturing of LF, determine the cause and take measures to eliminate errors;

- draw up technological and hardware schemes for the production of medicines;

- register the technological process and the results of quality control in the appropriate journals;

to identify frequently repeated prescriptions, to carry out intra-pharmacy preparation of medicines, to study the possibility of transferring them to production;

- take into account the influence of storage conditions and the type of packaging on the stability of the LF;

to carry out step-by-step control of technological processes and quality of medicines (forms) in pharmacies, in pharmaceutical industries;

make working prescriptions for obtaining a given amount of medicines;

- observe the rules of occupational health and safety;

observe the deontological principles of relations with the teams of pharmaceutical organizations, doctors, and patients.

To master:

- the use of materials from Pharmacopoeias and other normative literature in the manufacture and production of medicines.

- carrying out technological calculations of the manufacture and production of drugs.

- drawing up technological and hardware schemes for the production of drugs.

-finding the optimal approach to solving practical issues.

-practical skills in providing sanitary conditions, aseptic manufacturing conditions; equipping technologists ' workplaces and production facilities with equipment and ensuring their proper operation;

- practical skills in the implementation of technological expertise of the recipe, detection and prevention of pharmaceutical incompatibility.

-practical skills in the manufacture of dosage forms according to individual prescriptions, industrial regulations and other regulatory documents in the conditions of pharmacies, small-scale production; production of concentrates, semi-finished products and preparations in the form of an intra-pharmaceutical preparation.

- competencies in the field of pharmaceutical technology for the implementation of professional activities of a pharmacist - production, control and licensing, information and educational and research.

- bibliographic search using modern information technologies.

Pharmacognosy

- the basic concepts of pharmacognosy, methods of pharmacognostic analysis, tasks of pharmacognosy at the present stage and its importance for the practical activity of a pharmacist;

- the main stages of the development of pharmacognosy, modern directions of scientific research in the field of medicinal plants;

-organization of preparations medicinal plant materials; procurement organizations and their functions;

-system of state measures for the rational use and protection of medicinal plants;

-methods of resource research to establish natural reserves of medicinal plant materials;

- general principles of rational procurement of medicinal raw materials and measures for the protection of natural exploited thickets of medicinal plants;

-nomenclature of cultivated medicinal plants; basic techniques for their cultivation;

-system for standardization of medicinal plant materials (chemical, pharmacological, botanical, morphological);

-nomenclature of medicinal plant raw materials and medicinal products of plant and animal origin, permitted for use in medical practice and for use in industrial production;

- basic information about the distribution and habitat of medicinal plants used in scientific medicine;

- the influence of environmental factors on the development of the raw material mass of medicinal plants and the accumulation of biologically active substances;

-methods of macro- and microscopic analyzes of whole medicinal raw materials

-analysis of fees;

-morphological and anatomical signs of medicinal raw materials approved for use in medical practice, possible impurities;

- the main groups of biologically active substances of natural origin and their most important physical and chemical properties;

ways of biosynthesis of the main groups of biologically active substances - methods of isolation and purification of the main biologically active substances from medicinal plant raw materials;

- basic methods of qualitative and quantitative determination of biologically active substances in medicinal plant raw materials; biological standardization of medicinal raw materials;

- raw material quality indicators and methods of their determination;

- requirements for packaging, labeling, transportation and storage of medicinal plant raw materials in accordance with the ND;

- requirements for the results of the analysis of medicinal plant raw materials;

- rights and obligations of specialists working in the field of standardization of medicinal plant raw materials;

- the main ways and forms of using medicinal plant raw materials in pharmaceutical practice and industrial production;

- basic information about the use of herbal medicines in medicine;

-safety regulations when working with medicinal plants and medicinal raw materials;

- know the basic concepts of modern ecology, the structure of macroecology, methods, global problems and tasks of ecology;

- know the development of environmental monitoring of medicinal plant raw materials and phytopreparations and the improvement of analytical methods and their metrological assessment in relation to phytopreparations;

- know the main anthropogenic factors affecting the quality of natural medicinal plant raw materials;

- the system of rational using natural resources of medicinal plants and their protection;

- the system of procurement medicinal plant raw materials in Kyrgyzstan;

- the system of complex resource research of medicinal plants;

- the system of standardization of medicinal plant raw materials and medicinal products of plant origin.

Be able to

: - determine the morphological characteristics of medicinal plants in live and herbalized form;

- use macroscopic analysis to determine the authenticity of medicinal plant raw materials;

- use microscopic analysis to determine the authenticity of medicinal plant raw materials;

- determine the medicinal plant raw materials in their whole form with the help of appropriate determinants;

-determine the composition of official fees;

- recognize the impurities of foreign plants when collecting, accepting and analyzing medicinal plant raw materials, as well as when determining it in whole, cut and powdered form;

- conduct qualitative and microchemical reactions to the main biologically active substances contained in medicinal plants and raw materials (polysaccharides, essential oils, vitamins, cardiac glycosides, saponins, anthracene derivatives, coumarins, flavanoids, tannins, alkaloids, etc.);

- select chromatography methods for the analysis of medicinal plant raw materials;

- analyze medicinal plant raw materials for the content of essential oils, cardiac glycosides, saponins, alkaloids, anthracene derivatives, tannins, flavonoids, coumarins, vitamins, etc. according to the methods of quantitative determination provided for by the relevant ND.;

- determine the moisture content, ash content, and pulverization by the methods provided for by the GF XI;

- to carry out acceptance of medicinal plant raw materials, to take the samples necessary for its analysis according to GF XI;

- perform statistical processing and registration of the results of pharmacognostic analysis.

- determine extractive substances in medicinal plant raw materials according to GF XI;

- recognize foreign plant impurities in medicinal plant raw materials;

- carry out the determination of radioactivity and heavy metals in medicinal plant raw materials;

- conduct a test for the content of pesticides of medicinal plant raw materials;

- to determine the microbiological purity of medicinal plant raw materials;

- determine the operational reserve, the possible volume of annual procurement;

- to carry out the preparation of medicinal raw materials of various morphological groups;

- to carry out acceptance, reduction of raw materials to the standard condition, analysis, processing, storage and release of medicinal raw materials and medicinal products of plant origin.

To master

- morphological characteristics to recognize medicinal plants in living and herbalized form;

- the technique of macro-and microscopic analysis for determining the authenticity of medicinal plant raw materials and recognizing foreign plant impurities during the collection, acceptance and analysis of raw materials;

- determination of LRS in whole and crushed form with the help of appropriate determinants;

- determination of stocks and possible volumes of LRS procurement;

-high quality and micro chemical reactions to the main biologically active substances contained in medicinal plants and raw materials (polysaccharides, essential oils, vitamins, cardiac glycosides, saponins, anthracenedione, coumarins, flavonoids, tannins, alkaloids, etc.);

-the methods of quantitative determination provided for in the relevant regulatory documents, LRS for the content of polysaccharides, essential oils, vitamins, cardiac glycosides, saponins, anthracenedione, coumarins, flavonoids, tannins, alkaloids, etc.);

- methods for determining numerical indicators by the methods provided for in the Tax Code;

- acceptance of LRS according to the pharmacopoeia;

- conducting statistical processing of the results of the analysis, to make a conclusion about the good quality of the LRS in accordance with the current requirements.

- the technique of conducting qualitative and micro chemical reactions;

-the use of chemical, titrimetric, gravimetric methods of analysis

- to recognize medicinal plants in live and herbalized form by morphological features;

to determine stocks and possible volumes of LRS procurement;

- make a conclusion about the good quality of LRS in accordance with the current requirements.

- the technique of conducting qualitative and micro chemical reactions; the use of chemical, titrimetric, gravimetric and chromatographic methods of analysis

- provide information and consulting services for the procurement and storage of raw materials and herbal medicines

- qualitative and micro chemical reactions to the main biologically active substances contained in medicinal plants and raw materials (polysaccharides, essential oils, vitamins, cardiac glycosides, saponins, anthracene derivatives, coumarins, flavonoids, tannins, alkaloids, etc.);

-metric characteristics that determine the regulatory documentation, medicinal product for the content of polysaccharides, essential oils, vitamins, cardiac glycosides, saponins, anthracene derivatives, coumarins, flavonoids, tannins, alkalo, etc.);

-the methods of numerical indicators of the methods established by the pharmacopoeia;

-reception of medicinal product in accordance with the pharmacopoeia;

-the skills of conducting a chemical-toxicological study in order to diagnose acute poisoning with medicinal plants containing poisonous and potent substances

- the skills of creating storage conditions, using medicinal products of plant origin for various diseases

Pharmaceutical chemistry

To know:

-safety rules and procedures for working in chemical laboratories with reagents and devices;

- theoretical foundations of chemical sciences, the current level of their development, methods and methods of performing qualitative analysis, methods, techniques and methods of performing chemical and physico-chemical analysis to establish the qualitative state and quantitative definitions;

- methods of separation of substances (chemical, chromatographic, extraction);

- the nomenclature of drugs of industrial production;

- methods of isolation and purification of the main biologically active substances from medicinal plant raw materials;
- design and operation of modern laboratory and production equipment
- features of the analysis of individual dosage forms;
- chemical constants of medicinal substances, methods for determining the melting point, rotation angle, specific absorption index, boiling point;
- the concept of validation; validation characteristics of methods of qualitative and quantitative analysis;

- chemical methods used as the basis for the qualitative analysis of medicines;

- the main structural fragments of medicinal substances, according to which the identification of inorganic and organic medicinal substances is carried out;

- general and specific reactions to individual cations, anions, and functional groups;

- chemical methods used as the basis for the quantitative analysis of medicinal products;

- equations of chemical reactions occurring during acid-base, redox, precipitation, complexometric titration;

- the principles underlying the physico-chemical methods of drug analysis.

Be able to:

- determine the general indicators of the quality of medicinal substances: solubility, melting point, density, acidity and alkalinity, transparency, color, ash, loss in mass upon drying;

- based on the technology of obtaining and purifying medicines, predict the presence of impurities in medicines and medicines;

- establish the quantitative content of medicinal substances in the substance and dosage forms by titrimetric methods;

- plan the analysis of medicinal products in accordance with their form according to regulatory documents and assess their quality according to the results obtained;

- prepare reagents, standard, titrated and test solutions;

- to carry out control, to establish the authenticity of medicinal substances by reactions to their structural fragments.

- to establish the quantitative content of medicinal substances in the substance of dosage forms by physicochemical methods;

- carry out tests for the purity of medicinal substances and set the limits for the content of impurities by chemical and physicochemical methods;

To master:

-the skills of stepwise quality control in the production and manufacture of medicines, the simplest operations when performing qualitative and quantitative analysis;

-technique of work on physical devices used for qualitative and quantitative analysis (photocolorimeter, spectrophotometer, pH meter);

- the skills of interpreting the results of the analysis of medicinal products to assess their quality;

- standard operating procedures for determining the order and execution of documents for the declaration of conformity of the finished product to the requirements of regulatory documents.

4.3. The objects of professional activity of a graduate who has mastered the specialty program are:

-medicines ;

- a set of tools and technologies aimed at creating conditions for the development, production, quality control, circulation of medicines and control in the field of circulation of medicines in accordance with the established requirements and standards in the field of healthcare;

-Individuals and legal entities;

-population.

4.4. Graduates of the "Pharmacy" faculty of the KSMA on the educational program in the direction of training in the specialty 560005 "Pharmacy" should be prepared for the following types of professional activities:

-organizationand managementl;

-control and permissive;

-industrial;

-sales of medicines and other goods of the pharmacy range;

-marketing;

-information-advisory and educational;

-chemical and toxicological;

-scientific research.

4.5. Tasks of the professional activity of the graduate

A graduate who has mastered the specialty program in the specialty 560005 "Pharmacy" is ready to solve the following professional tasks in accordance with the types of professional activities that the program is focused on:

Pharmaceutical activities:

-Production and manufacture of medicines; sale of medicines;

-provision of conditions for storage and transportation of medicines;

-participation in carrying out procedures related to the circulation of medicines;

-participation in quality control of medicines;

-providing information about medicinal products within the limits established by the current legislation;

-conducting sanitary and educational work with the population;

- formation of motivation of citizens to maintain health;

Organizational and managerial activities:

-participation in the organization of production and manufacture of medicines; organization and implementation of measures for the storage, transportation, seizure and destruction of medicines;

-participation in the organization and management of the activities of organizations involved in the circulation of medicines, and (or) their structural units;

-participation in the organization of measures for labor protection and safety, prevention of occupational diseases, monitoring compliance and ensuring environmental safety;

-maintaining accounting and reporting documentation in a pharmaceutical organization;

-compliance with the basic requirements of information security;

Research activities:

-Analysis of scientific literature and official statistical reviews, participation in statistical analysis and public presentation of the results;

-participation in the solution of individual research and scientific-applied problems in the field of drug circulation.

4.6. Competencies of a university graduate as the cumulative expected result of education upon completion of the development of OEP HPE, verified at the State Academy of Arts

A graduate who has mastered OE HPE in the specialty 560005 "Pharmacy" must have the following competencies:

Universal competences:

General scientific competence (GC)

GC-1 - Able and ready to analyze socially significant problems and processes, to use in practice the methods of the humanities, natural sciences, biomedical and clinical sciences in various types of professional and social activities;

GC-2 - Able and ready to analyze significant political events and trends, to master the basic concepts and laws of the world historical process, to respectful and careful attitude to the historical heritage and traditions, to assess the state policy, to form a civil position;

GC-3 - Able and ready to assess morphofunctional, physiological conditions, pathophysiological processes in the human body, identify clinical syndromes of socially significant and most common diseases and emergency conditions for solving professional problems;

GC-4 - Able and ready to use the methods and means of physical culture to ensure full-fledged social and professional activity;

GC-5 - Able and ready to use the techniques of providing first emergency first aid.

Social and personal competencies (SLC)

SLC-1 - Able and ready to implement ethical, deontological and bioethical principles in professional activities;

SLC-2 - Able and ready to analyze worldview, socially and personally significant philosophical problems, basic philosophical categories, to self-improvement;

SLC-3 - Able and ready to carry out its activities taking into account the moral and legal norms adopted in society, to comply with laws and regulations on working with confidential information, to bear social and ethical responsibility for decisions made;

SLC-4 - Able and ready to work in a team, tolerantly perceive social, ethical, confessional and cultural differences;

SLC-5 - Able and ready to analyze the results of his own activities to prevent professional mistakes, while realizing disciplinary, administrative, civil and criminal responsibility.

Instrumental Competencies (IC)

IC-1 - Able and ready to solve standard tasks of professional activity using information, bibliographic resources, biomedical and pharmaceutical terminology, information and communication technologies and taking into account the basic requirements of information security;

IC-2 - Capable and ready for written and oral communication in the state, official, foreign and Latin languages for solving professional problems;

IC-3- Able and ready to use basic physical and chemical, mathematical and other natural science concepts and methods in solving professional problems;

IC-4 - Capable and ready to use specialized equipment and medical devices intended for use in the professional field;

IC-5 - Able and ready to work with computer hardware and software for system and applied purposes for solving professional problems;

IC-6 - Able and ready to apply the basic methods, methods and means of obtaining, storing, processing, transferring scientific and professional information using modern information and communication technologies.

Professional competencies (PC):

Pharmaceutical activities:

Organizational and management, control and permitting:

PC-1 - Able and ready to participate in the implementation of the main provisions of the State Drug Policy of the Kyrgyz Republic;

PC-2 - Able and ready to participate in organizing the activities of pharmaceutical organizations;

PC-3- Able and ready to apply the basic principles of management in the pharmaceutical industry, including in pharmaceutical organizations and their structural divisions;

PC-4 - Able and ready to use the basics of economic and legal knowledge in professional activities;

PC-5 - Able and ready to participate in the development and improvement of drugs, their production, examination, registration, preclinical, clinical trials in accordance with the requirements of international and national standards (GLP, GCP, GMP, GDP, etc.);

PC-6 - Able and willing to participate in the implementation of an appropriate pharmacovigilance system;

PC-7 - Able and ready to organize quality control of medicines in the conditions of pharmaceutical organizations.

Production:

PC-8 - Able and ready to carry out quality control of drugs during the period of their circulation on the market, including control of the drug in the process of its improvement and monitoring of undesirable effects ;;

PC-9 - Able and ready to support the activities of pharmaceutical organizations in occupational health and safety, prevention of occupational diseases, monitoring compliance and ensuring environmental safety;

PC-10 - Able and ready to assess the quality of medicinal plant materials (used plant organs, histological structure, chemical composition of active and other groups of biologically active substances);

PC-11 - Capable and ready to ensure quality control of medicines in the conditions of pharmaceutical organizations;

PC-12 - Able and ready to carry out technological processes in the production and manufacture of medicines in compliance with the requirements of international and national standards;

PC-13 - Able and ready to organize the procurement of medicinal plant materials, taking into account the rational use of medicinal plant resources.

Sale of medicines and other goods of the pharmacy range, information and advisory and educational:

PC-14 - Able and ready to implement the sale of medicines in accordance with the rules of wholesale trade, the procedure for retail sale;

PC-15 - Capable and ready to provide storage of medicines and medical devices;

PC-16 - Able and ready to carry out the transportation of medicines, taking into account the principles of transport logistics and compliance with the requirements of the cold chain;

PC-17 - Able and ready to participate in the procedures for the import of medicines into the Kyrgyz Republic and the export of medicines from the Kyrgyz Republic;

PC-18 - Able and ready to participate in the implementation of state programs of preferential drug provision at the outpatient and inpatient levels;

PC-19 - Able and ready to take measures for the timely identification of expired drugs, expired drugs, counterfeit, counterfeit and substandard drugs, withdrawing them from circulation for further destruction in accordance with applicable law;

PC-20 - Able and ready to use communicative processes in management, communication with specialists of healthcare organizations, personnel of pharmaceutical organizations, patients, their relatives and carers, the population;

PC-21 - Able and ready to provide information and advisory assistance to healthcare professionals and drug consumers in accordance with the rules of good pharmacy practice;

PC-22 - Able and ready to carry out sanitary and educational work and motivate the population to maintain health and a healthy lifestyle;

PC-23 - The ability and willingness to take part in the organization of the first pre-medical care for patients and victims in extreme, urgent and life-threatening situations;

PC-24 - The ability and willingness to take part in providing assistance to the population in emergency situations at the stages of evacuation, including in organizing the supply of drugs and medical devices;

PC-25 - Capable and ready to participate in pharmacoeconomic analysis and pharmacoepidemiological research.

Chemical and toxicological:

PC-26 - Able and ready to participate in carrying out a chemical and toxicological study in order to diagnose acute poisoning with drugs, poisons, etc., narcotic and alcoholic intoxication.

Research:

PC-27 - Capable and ready for the analysis and public presentation of scientific pharmaceutical information;

PC-28 - Able and ready to participate in the formulation of scientific problems and their experimental implementation;

PC-29 - Able and ready to work with scientific literature, analyze information, conduct a search, turn what I read into a tool for solving professional problems (highlight the main provisions, consequences and proposals).

4.7. Learning outcomes verified by GIA:

PO1: Able to use basic knowledge of mathematical, natural, humanitarian, economic sciences in professional work and independently acquire new knowledge;

PO2: Able to carry out business communication, reasonably and clearly express his thoughts in the state and official languages. (OK5, OK6, IK2)

PO3: Possesses the basic methods and skills of using computer programs to obtain, store and process information;

PO4: Knows how to work in a team, guided by moral and ethical norms based on tolerance, the desire for cooperation, strengthening mutual understanding between representatives of various social groups, ideological positions, national cultures;

PO5: Knows how to apply professional knowledge and personal qualities for the purpose of self-realization, including in the latest fields of knowledge, the most significant areas of professional activity and social life;

PO6: Able to organize the processes of manufacturing and production of medicines in accordance with approved regulatory documents while ensuring a high level of quality, including sanitary and microbiological requirements;

PO7: Knows how to determine the reserves of medicinal plant raw materials in nature, organize their preparation and drying;

PO8: Able to carry out activities in the field of drug circulation, in the formation of budgetary and social policies in the health care system in accordance with the laws of the Kyrgyz Republic;

PO9: Able to be aware of the responsibility for the results of his professional and scientific activities before the country and humanity, has an active civic position based on democratic convictions and humanistic values;

PO10: Able to organize administrative and economic activities in the field of drug circulation and management of their structural units;

PO11: Is able to perform all types of pharmaceutical analysis of all types of medicinal products, including medicinal plant materials and excipients, in accordance with the requirements of regulatory documents;

PO12: Able to carry out research, advisory and outreach programs in the field of pharmacy;

PO13: Able to plan and organize the work of pharmaceutical organizations in conjunction with healthcare organizations to provide medical care to the population;

PO14: Knows how to conduct chemical and toxicological studies in the forensic medical examination system and other research institutions;

RO15: Knows how to provide the first pre-hospital medical aid to the population.

5 STRUCTURE, VOLUME AND CONTENT OF THE STATE FINAL CERTIFICATION

The total labor intensity of all stages of the final state certification is one credit (30 hours).

State final certification of students in the specialty 560005 "Pharmacy" is carried out on schedule and includes several mandatory certification tests:

1. State exam in the discipline "History of Kyrgyzstan" (end of the 4th semester)

2. State interdisciplinary comprehensive examination in the specialty "Pharmacy" (end of the 10th semester).

The state interdisciplinary exam in the discipline "History of Kyrgyzstan" is carried out in the form of computer testing and controls the following competencies: GC3, SLC1, SLC2, IC2.

The state comprehensive interdisciplinary final exam in the specialty is carried out in stages and includes a test control of knowledge in the subjects "Management and Economics of Pharmacy", "Technology of Medicines," Pharmacognosy and "Pharmaceutical Chemistry", a practical exam and an interview. The purpose of this exam is to control OC1, OC2, OC3, OC4, OC5, SLC1, SLC 2, SLC 3, SLC 4, SLC 5 and PC 1,2,3,4,5,6,7,8,9,10 , 11,12,13,14,15,16,17,18,19,20,21,23,25,27,28,29.

5.1. State Exam Program on the History of Kyrgyzstan

5.1.1. The form of the State examination is computer testing. Computer testing is carried out according to the schedule with the technical support of TsRKNOZ and PP KSMA. The exam is carried out according to standard test items, compiled on the basis of a single bank of attestation assignments, covering the content of the subject "History of Kyrgyzstan".

The exam is conducted in a computer lab. When passing the test, each examinee using a special computer program by the method of random sampling from the bank of tests receives an individual task containing 50 questions. Within 45 minutes without a break, the student solves the test tasks, noting the correct answer option. The criterion for assessing knowledge is the number of correct answers to test items. The threshold score is considered to be 60 or more points. Evaluation criteria for test items: up to 59 points inclusive - "unsatisfactory", from 60 to 75 - "satisfactory", from 76 to 85 - "good" and from 86 to 100 - "excellent". The results of checking the level of theoretical training are communicated to students on the day of testing after the registration of the relevant documents.

The student is obliged to appear for testing at the time specified in the schedule.

During testing, it is not allowed to use materials that are not intended for use during the exam, namely, phones, cheat sheets, an attempt to communicate with other students or other persons, including using electronic means of communication, unauthorized movement of students, etc. These actions are the basis for removing the student from the classroom and then putting the mark "unsatisfactory" on the list.

An example of the material for certification testing is in Appendix No. 1.

5.1.2. The list of control questions submitted to the State Historical Agency on the History of Kyrgyzstan:

1. The oldest traces of man in the Tien Shan.

2. Stone Age and Bronze Age on the territory of Kyrgyzstan.

3. Saki and Usun periods in the history of Kyrgyzstan.

4. Kyrgyzstan during the period of the Turkic Kaganate.

5. Kyrgyz great power: education, development, reasons for the collapse of the state.

6. Karakhanid Kaganate in the Tien Shan and his heirs (X-XIII centuries).

7. Kyrgyzstan during the period of domination of Karluks and Karakhanids.

8. Kyrgyz and Kyrgyzstan in the Chingizid state (XIII-XIV centuries).

9. Kyrgyz of the state of Mogolistan.

10. Ethnogenesis of the Kyrgyz people: stages, factors, theories.

11. The struggle of the Kyrgyz for national independence (XVI-XIX centuries).

12. Kyrgyzstan as part of the Kokand Khanate.

13. The relationship of the Kyrgyz with Russia: from the first embassies to accession.

14. Accession of Northern Kyrgyzstan to Russia.

15. Accession of Southern Kyrgyzstan to Russia.

16. Kyrgyzstan within the Russian Empire: changes in social, political and economic life.

17. Uprising of 1916 in Kyrgyzstan: causes, nature, consequences.

18. Features of the establishment of Soviet power in Kyrgyzstan. The essence of the Basmach movement.

19. Socio-economic transformations in Kyrgyzstan in the 20-30s.

20. Features of land and water reforms in Kyrgyzstan.

21. Attempts to create the Kyrgyz mountain region in 1922 and its reasons.

22. From the Kirghiz Autonomous Region (KAO) to the Kirghiz SSR: the formation and development of the Kirghiz Soviet statehood.

23. Socio-economic development of Kyrgyzstan within the USSR.

24. Kyrgyzstan during the Second World War. Heroes of Kyrgyzstan.

25. Kyrgyzstan during the years of "thaw" and years of "stagnation"

26. Development of science, culture and education in Kyrgyzstan in the twentieth century.

27. Kyrgyzstan in the years of perestroika and glasnost.

28. Sovereign Kyrgyzstan: stages of formation, problems and development prospects.

29. State and political structure of modern Kyrgyzstan.

30. The main parties and political movements in Kyrgyzstan at the present stage.

31. The oldest traces of man in the Tien Shan. Paleolithic.

32. Stone tools.

33. Primitive beliefs.

34. Saki in the history of the ancient world.
35. The struggle of the Sakas with the Persian kings.
36. In the struggle against the conquests of Alexander the Great.
37. The culture of the Saka tribes.
38. The origin of the Usun people and the formation of the state.
39. Journey of Zhan Tsan and the discovery of the Great Silk Road.
40. The city of Chigu on Issyk-Kul is the headquarters of the Usun ruler.
41. The formation of the union of the Xiongnu tribes.
42. The first mention of the ethnonym "Kyrgyz" (201 BC).
43. Resettlement of the Kyrgyz from Mongolia to the Yenisei.
44. Organization of the state of Davan.
45. Orkhon-Yenisei runic written monuments.
46. Ancient Turks.
47. Formation of the Turkic state.
48. The conquest of the Kyrgyz by the Turks of the Yenisei and Central Asia.
49. Istemi-kagan.
50. Embassy of Maniah to Iran (567) and Constantinople (568).
51. Rise of the Western Turkish Kaganate - “the state of ten arrows”.
52. Arab conquests in Central Asia.
53. The state of the Turgesh. Tribes of Karluks.
54. Talas battle of the Arabs with the Chinese in 751.
55. Kagan of the Kyrgyz Bars-beg.
56. Great power of the Kyrgyz.
57. Stone statues.
58. Ancient Kyrgyz and other types of writing.
59. Ideological views. Zoroastrianism, Tengrianism, Christianity, Buddhism, Islam.
60. Karakhanid Kaganate (X - early XIII centuries)
61. “Kutadgu Bilik” by Yusup Balasaguni.
62. “Divan lugat at-Turk” by Mahmud Barskhani (Kashgari).
63. Kyrgyz and Kyrgyzstan in the state of Chingizids. XIII - XIV centuries
64. Conquest by the Mongols of the Kyrgyz of the Yenisei and Tien Shan.
65. Kyrgyz in the Chagatai ulus.

66. Formation of the state of Haidu.

67. Tatar-Mongols in Asia.

68. State of Mogolistan.

69. Ethnic origins of the Kyrgyz people.

70. Muhammad-Kyrgyz.

71. Dzungar Khanate.

72. The struggle of the Kyrgyz against the Kalmaks and its reflection in the epic "Manas".

73. The movement of the Khoja in East Turkestan and the participation of the Kyrgyz in it.

74. Kyrgyz embassies to China.

75. Formation of the Kokand Khanate.

76. Kubat-biy - the leader of the Kyrgyz.

77. The role of Kyrgyz biys in palace intrigues. Kokand

78. Alymbek and Kurmanjan-datka.

79. Land relations and the problem of nomadic feudalism.

80. Spiritual culture: oral folk art, religion and beliefs.

81. Kalygul, Arstanbek, Moldo Kilich, Moldo Niyaz.

82. Embassy of I. Unkovsky (1722 - 1724).

83. The first Kyrgyz embassy to Russia (1785).

84. Attack-bey. Abdrakhman Kuchakov and Shergazy are the first Kyrgyz ambassadors.

85. Embassy of Zibberstein F.K. to Issyk-Kul in 1825

86. The uprising of the Kyrgyz ser. XVIII century - 70s. XIX century.

87. Tailak-batyr, Atantai, Dzhantai, Baytik-batyr.

88. The rise and fall of Ormon Khan.

89. Borombay and Kachibek.

90. P.P. Semenov-Tyan-Shansky and Ch.Ch. Valikhanov in Kyrgyzstan.

91. "Military-scientific" expedition of MD Skobelev to Alai (1875 - 1876).

92. Shabdan Dzhantaev.

93. Kurmanjan-datha is the queen of Alai.

94. Kyrgyzstan is a colony of the Russian Empire.

95. Resettlement of Russian-Ukrainian peasants to Kyrgyzstan.

96. Emigration of Dungans and Uighurs from China to Kyrgyzstan.

97. Andijan uprising.

98. Russian scientists and travelers in Kyrgyzstan: Severtsov I.A., Fedchenko A.P., Radlov V.V., Mushketov I.V., Przhevalsky N.M., Bartold V.V.

99. The first changes in culture and public education. Toktogul Satylganov and Togolok Moldo

100. Shvets-Bazaar.

101. Basmak movement.

102. Attempts to create the Mountain Kyrgyz region in 1922

103. New economic policy in Kyrgyzstan.

104. The origin of professional fiction and science.

105. Kasym Tynystanov and Ishenaly Arabaev.

106. Repressions of prominent figures in politics, science and culture of Kyrgyzstan in the 20-30s.

107. Political opposition to the totalitarian Stalinist regime.

108. Abdykerim Sydykov, Yusuf Abdrakhmanov, Bayaly Isakeev, Torokul Aitmatov and others.

109. Heroic deeds of the Kyrgyz people on the battlefields.

110. The Constitution of the Kirghiz SSR 1977. slogans, declarations and life

truth.

111. The objective necessity of restructuring the entire social life of the country. Moscow putsch. GKChP and its reflection in Kyrgyzstan. Prohibition of the Communist Party of the Republic. The Belovezhskaya Agreement of the leaders of Russia, Ukraine and Belarus on the denunciation of the Union Treaty. The collapse of the USSR.

112. Recognition of the independent Kyrgyz Republic by the international community. Formation of parliamentarism and the institution of the president.

113. Consequences of the collapse of the traditional economic ties of the CIS states.

114. The formation of a multi-party system.

115. Kyrgyzstan on the world stage.

116. Establishment of diplomatic relations with foreign countries: Turkey, China, USA, Russia, etc.

117. Science, culture and education in market conditions.

118. Kyrgyzstan in the system of international relations.

119. Relations with Russia, USA and China.

120. Problems of national security of Kyrgyzstan in the context of globalization.

5.1.3. List of literature for the preparation for the SFA- "History of Kyrgyzstan"

Main literature:

1. Nurbol Dos uulu Chotonov. National history. - B., 2009.

2. Osmonov O.Zh. History of Kyrgyzstan .. - B., 2000.

3. Osmonov O.Zh., Myrzakmatova A.Zh. Kyrgyzstan tarykhy. - B., 2000.

Additional literature:

1. Asankanov A.A., History of Kyrgyzstan. - Bishkek 2009.

2. Anwar Baitur. Kyrgyz tarykhynyn lectures. 1-2- kitep. - Bishkek, 1992.

3. Bartold V.V. Ibranny works on the history of the Kyrgyz and Kyrgyzstan. - Bishkek, 1996.

4. Introduction to the history of Kyrgyz statehood. A course of lectures for universities. - B., 2004.

5. Voropaeva V., Dzhunushaliev D., Ploskikh V. History of the Fatherland. A short course of lectures on the history of Kyrgyzstan - B., 2005

6. Voropaeva V., Dzhunushaliev D., Kemelbaev N., Ploskikh V. Introduction to the history of Kyrgyz-Russian relations: A course of lectures. - B., 2001

7. Voropaeva V., Dzhunushaliev D., Ploskikh V. From the history of Kyrgyz-Russian relations (XVIII - XX centuries). A short course of lectures and a methodological manual. - B., 2001

8. History of the Kyrgyz and Kyrgyzstan. Uch. manual for universities. - B., 2000.

9. Koichuev T., Mokrynin V., Ploskikh V. Kyrgyz and their ancestors. - B.1994.

10. Osmonov O. Zh., History of Kyrgyzstan (from ancient times to the present day) –Bishkek 2013, 2014., 2015.

Electronic resources

1. Site of KSMA named after I.K. Akhunbaeva https://www.kgma.kg/index.php/ru/

2. Kyrgyz Virtual Scientific Library www.kyrgyzstanvsl.org

3. Electronic resource "Electronic Library" KSMA (library.kgma.kg)

4. Electronic resources of the eIFL project. http://bik.org.kg/ru/eifl_resources/

5.www.nlkrgov.kg (National Library of the Kyrgyz Republic)

6.www.istok.net.kg (website of the National Academy of Sciences of the Kyrgyz Republic)

5.2. The program of the State final interdisciplinary complex examination in the specialty "Pharmacy".

GIA graduate includes the State final comprehensive interdisciplinary three-stage exam.

I stage of the SFA - interdisciplinary testing, which is carried out in a computer center using personal computers, and is aimed at checking the level of theoretical preparedness through a test exam on a computer basis.

II stage of SFA- practical stage

III stage of the SFA - oral interview in the disciplines "Management and Economics of Pharmacy", "Technology of Medicines," Pharmacognosy "and" Pharmaceutical Chemistry ".

5.2.1. Computer testing is carried out according to the schedule with the technical support of testing center KSMA. The test material covers the content of the disciplines "Management and Economics of Pharmacy", "Technology of Medicines," Pharmacognosy "and" Pharmaceutical Chemistry ".

The exam is conducted according to standard test items, compiled on the basis of a single bank of interdisciplinary certification assignments. The exam to determine the level of theoretical training of graduates is held simultaneously in a computer class. When passing the test with the help of a special computer program that allows to prepare individual test tasks by random sampling from a bank of test tasks, each examinee receives an individual task containing 100 questions. Within 90 minutes without a break, the graduate solves the test tasks, marking the correct answer. The criterion for assessing the knowledge of graduates is the number of correct answers to test tasks. The threshold score is considered to be 60 or more points. Evaluation criteria for test items: up to 59 points - "unsatisfactory", from 60 to 75 - "satisfactory", from 76 to 85 - "good" and from 86 to 100 - "excellent". A student who answers 60% or more of the questions correctly is allowed to the next stage. In case of violation of the procedure for conducting testing or refusal to comply with it, the chairman of the SJSC has the right to remove the student from testing, about which an appropriate act is drawn up. During the period of students' work on test assignments, members of the state examination committee are present in the audience.

The results of checking the level of theoretical training are reported to graduates on the day of testing after the registration of the relevant documents.

An example of the material for proficiency testing is in Appendix No. 2.

5.2.2. The practical stage is designed to test professional competencies. At this stage, the graduate is given the opportunity to demonstrate the consistent implementation of the volume of skills and abilities necessary for professional activity. In addition, at this stage, an assessment of the effectiveness of the teaching activities of the departments and courses responsible for the practical training of students is given.

The practical state exam is taken on the basis of the graduating departments of pharmacognosy and chemistry of drugs and management and economics of pharmacy, technology of drugs.

The tasks of this stage are issued in the form of an examination card. Each ticket contains four tasks, one from each discipline submitted to the GIA: "Management and Economics of Pharmacy", "Pharmaceutical Chemistry", "Pharmaceutical Technology", "Pharmacognosy".

The graduate receives a ticket, the necessary additional materials and is certified directly at the workplace in specialized educational laboratories and classrooms.

The time for preparation at the II stage of the interdisciplinary exam is 45 minutes, the time for the answer is 10-15 minutes.

A list of basic practical skills to be tested at stage II of the state exam.

A student who has shown positive results is admitted to the third stage of the final interdisciplinary exam.

Evaluation criteria for the practical part of the exam:

The answer is assessed as "excellent" if the graduate: fully demonstrates practical skills, avoiding mistakes. Exhaustively interprets the results obtained, complies with ethical and deontological principles.

The answer is assessed as “good” if the graduate fulfills most of the demonstrated practical skills, but there are minor errors. The student is able to interpret the received data with little difficulty, follows ethical and deontological principles.

The answer is assessed as “satisfactory” if the graduate demonstrates partial fulfillment of practical skills. The task was completed by no more than half, a large number of mistakes were made. The student is not able to interpret the results obtained; he observes ethical and deontological principles.

The answer is assessed as "unsatisfactory" if the graduate either does not perform practical skills at all, or performs them completely incorrectly.

5.2.3. The theoretical oral exam on the card is the third final stage and is passed after passing the testing and practical state exam. Tickets are drawn up by issuing departments, reviewed and approved by the UMPK of the Faculty of Pharmacy, KSMA named after I.K. Akhunbaeva. The structure of the examination card includes questions on academic disciplines, the results of which are of decisive importance for the professional activities of graduates:

Pharmacy Management and Economics

Drug technology

Pharmacognosy

Pharmaceutical chemistry

Achievement of “satisfactory”, “good” and “excellent” marks means successful completion of the stage. This stage is final.

Time is given to prepare for answering situational tasks 40 minutes, for answers 10 minutes.

During the interview, the members of the examination committee assess the integrity of the graduate's professional training, that is, the level of his competence in using the theoretical basis for solving professional situations. The final grade is given to the graduate after discussion of his answers by the members of the examination committee on a five-point system. The decisions of the state examination commission are made at a closed meeting by a majority of votes of the members of the commission participating in the meeting, with the obligatory presence of the chairman of the commission or his deputy. In case of an equal number of votes, the chairman of the commission has a casting vote. The results of certification are announced to graduates on the same day after the registration and approval of the minutes of the meeting of the State Examination Commission. The results of the state attestation of graduates are drawn up in the form of the Chairman's Report on the work of the state examination commission. The report is heard at the Academic Council of the KSMA. The decision of the state examination commission on the assignment of qualifications to graduates who have passed the state final attestation and the issuance of a corresponding diploma of higher professional education is announced by the order of the rector of the KSMA.

Criteria for assessing the final interview:

The answer is assessed as "excellent" if the graduate: has deeply, fully and firmly mastered the program material, expresses it exhaustively, consistently, competently and logically

harmoniously, theory and practice are closely linked in the answer; does not find it difficult to answer when modifying the assignment, shows familiarity with the monographic literature, correctly justifies the decisions made, answers all the questions of the ticket, as well as additional questions from the members of the commission.

The answer is assessed as "good" if the graduate: firmly knows the program material, expresses it competently and to the point, does not allow significant inaccuracies in answering the question, correctly applies theoretical provisions to solve practical issues, tasks, has the necessary skills and techniques for their implementation, and answers 80% of the questions posed to him.

The answer is assessed as "satisfactory" if the graduate: knows only the basic material, makes inaccuracies, insufficiently correct formulations, disruptions in the sequence of presentation of the program material and answers 70% of the questions.

The answer is assessed "unsatisfactory" if the graduate: does not know a significant part of the program material, makes significant mistakes in answering questions, is not oriented in the main questions of the specialty.

Criteria for the overall assessment of the final interdisciplinary exam.

“Excellent” if the average score for the previous stages is higher than or equal to 4.5. “Good” if there is an average score for the previous stages from 3.5 to 4.4. “Satisfactory” if there is an average score for the previous stages from 3.0 to 3.4. Retaking the final interdisciplinary exam in order to increase the positive mark is not allowed. The results of the SIA are announced to the graduate on the same day after the minutes of the meeting of the state examination commission are drawn up. Based on the results of the three stages, the state examination commission gives the final mark for the interdisciplinary exam. Grades "excellent", "good", "satisfactory" mean successful completion of the state exam.

At all stages of the SFA, the student is prohibited from carrying and using communications and electronic computing equipment, with the exception of non-programmable calculators, in addition, it is not allowed to use his own reference materials, including those made independently. In the course of answering to the examination committee, the student has the right to use a sheet for preparing answers (draft), which, after answering, is handed over to the secretary of the SCC (including if the student has not made any notes on it).

A separate protocol for passing the state exam is drawn up for each group of students. In the minutes of the SFA meeting for the reception of the final interdisciplinary exam, marks are given for the practical and theoretical (testing and oral questioning) preparation of the student. The minutes of the meetings of the commissions are signed by the chairman, members and the secretary of the SAC. The minutes of the meetings of the commissions are stitched together and stored in the archives of the KSMA named after I.K. Akhunbaev

The list of questions submitted for the state interdisciplinary comprehensive examination in the specialty "Pharmacy"

Pharmacognosy

Theoretical stage.

1. Basic methods of pharmacognostic analysis of medicinal plant materials.

2. Chemical composition and properties of mucus and mucus-containing plants. The role of mucus in plants. The use of mucus and mucus-containing plants in medicine.

3. Basic conditions for the procurement, drying and storage of medicinal plant materials containing mucus.

4. The concept of vitamins and their classification. Distribution of vitamins in the plant kingdom.

5. Physicochemical properties of water-soluble and fat-soluble vitamins. Qualitative and chemical analysis of medicinal plant materials containing vitamins.

6. Basic conditions for the procurement, drying and storage of medicinal plant materials containing vitamins.

7. General information about terpenoids and their classification.

8. Classification of essential oils and essential oil raw materials. Physical and chemical properties of essential oils.

9. Localization of essential oils in plants. The importance of essential oils for plants and patterns in the dynamics of their accumulation.

10. Methods for obtaining essential oils in plants. Biochemical processes occurring in medicinal plant raw materials before obtaining essential oils.

11. Research and standardization of essential oils.

12. Basic conditions for the procurement, drying and storage of medicinal plant materials containing essential oils.

13. The concept of alkaloids and their classification. Physicochemical properties of alkaloids.

14. Distribution of alkaloids in the plant kingdom. Localization of alkaloids in plants.

15. Dynamics of alkaloid content of plants in the process of their ontogenetic development. The influence of external factors on the content of alkaloids in plants.

16. Methods for the isolation of alkaloids from medicinal plant materials.

17. Phytochemical analysis of medicinal plant materials containing alkaloids.

18. Basic conditions for the procurement, drying and storage of medicinal plant materials containing alkaloids.

19. The concept of phenolic compounds and their classification. Distribution of phenolic compounds in the plant kingdom.

20. General characteristics of simple phenols and their classification. Physicochemical properties of simple phenols. Distribution, localization of simple phenols.

21. Methods for the isolation of simple phenols from medicinal plant materials. Phytochemical analysis of medicinal plant materials containing simple phenols.

22. Basic conditions for the procurement, drying and storage of medicinal plant materials containing simple phenols.

23. The concept of flavanoids and their classification. Physicochemical properties of flavanoids. Flavanoid glycosides. Distribution of flavanoids in nature.

24. Isolation of flavanoids from medicinal plants and purification. Phytochemical analysis of medicinal plant materials containing flavanoids.

25. Basic conditions for the procurement, drying and storage of medicinal plant materials containing flavanoids.

26. The concept of tannins and their classification. Physicochemical properties of tannins.

27. Features of the accumulation of tannins in plants. Distribution of tannins in plants and their biological role.

28. Methods of isolation, identification of tannins. Phytochemical analysis of medicinal plant materials containing tannins.

29. Basic conditions for the procurement, drying and storage of medicinal plant materials containing tannins.

30. General information about glycosides and their classification. Glycosides and enzymes.

31. The structure and classification of cardiac glycosides. Distribution of cardiac glycosides in the plant world.

32. Physicochemical, biological properties of cardiac glycosides. Biological methods for the standardization of medicinal plants containing cardiac glycosides.

33. Isolation of cardiac glycosides from medicinal plant materials and the principles of establishing their composition. Phytochemical analysis of medicinal plant materials containing cardiac glycosides.

34. Basic conditions for the procurement, drying and storage of medicinal plant materials containing cardiac glycosides.

35. General information about saponins and their classification. Physicochemical properties of saponins.

36. Methods for the isolation of saponins. Phytochemical analysis of medicinal plant materials containing saponins.

37. Basic conditions for the procurement, drying and storage of medicinal plant materials containing saponins.

38. The structure and classification of quinones. Physicochemical properties of anthracene derivatives.

39. Methods for the isolation of anthraglycosides from medicinal plant materials and the principles of establishing their composition. Phytochemical analysis of medicinal plant materials containing anthraglycosides.

40. Basic conditions for the procurement, drying and storage of medicinal plant materials containing anthraglycosides.

Practical stage

Conduct a pharmacognostic analysis of medicinal plant raw materials(MPRM)

1. Foxglove leaf

2.Spring adonis grass

3Llily of the valley herb

4.Kelp thallus - seaweed

5.Nettle leaf

6.Grass shepherd's purse

7.Peppermint leaf

8.Large plantain leaf

9.Eucalyptus leaf

10.Fruits of rose hips

11.Rhizome with valerian roots

12. Calamus rhizome

13.Grass of flat-leaved groundwort

14.Grass of motherwort five-lobed

15.Weed wormwood

16.Chinese tea leaf

17.Grass celandine large

18.Leaf of belladonna ordinary

19.Horsetail ephedra herb

20.Grass of a series of tripartite

21. Leaf and shoot of bearberry

22. Marshmallow root

23.Ephedra herb medium

24. Licorice root

25.Leaf of cassia angustifolia

26. Oak bark

27.Box of poppy sleeping pills

28. paprika fruit

ALGORITHM OF RESPONSE FOR PHARMACOGNOSTIC ANALYSIS OF MPRM

1. Russian, Latin and Kyrgyz names of medicinal plant materials producing plants and families.

2. Morphological characteristics of the plant.

3. The area and ecology of the medicinal plant.

4. Possible types and impurities.

5. Collection, drying and storage of medicinal plant materials.

6. Macroscopic analysis of medicinal plant materials.

7. Microscopic analysis of medicinal plant materials.

8. Qualitative and quantitative analysis of medicinal plant materials.

9. Ways of use, application in modern and traditional medicine.

10. Phytopreparations.

LIST OF MEDICINAL PLANTS AND MEDICINAL PLANT RAW MATERIALS FOR PRACTICAL SKILLS

Raw materials	**Herbarium and** micro-leaflets
MPRM, containing carbohydrates	
Althaea root, plantain leaf, kelp layer	Althaea medicinal, large plantain
MPRM, containing vitamins	
string grass, nettle leaf, shepherd's bag grass, rosehip fruit	• Shepherd's bag, nettle dioecious, rosehip, sea buckthorn, corn stigma
MPRM, containing monoterpenes	
mint leaf, eucalyptus leaf, rhizome with valerian roots	Valerian officinalis, peppermint, eucalyptus ball
MPRM**,**contains essential oils and bitterness	
calamus rhizome, wormwood herb	Wormwood bitter
MPRM, содержащее алкалоиды	
ephedra herb, chinese tea	Horsetail ephedra, capsicum, common belladonna, black henbane, thermopsis lanceolate, yellow cup, common barberry, yellow glaucine, flat-leaved crossberry, ergot, magnificent evergreen, Stephanie smooth, passionflower incarnate
MPRM, ontaining phenologlycosides and lignans	
bearberry leaf	Rhodiola rosea, levzeyasaflorovidnaya, Viburnum vulgaris, Eleutherococcus prickly, peony evasive, Chinese lemongrass, common ginseng
MPRM, containing flavanoids	
motherwort grass	Blood-red hawthorn, five-lobed motherwort, water pepper, sand immortelle
MPRM, containing tannins	
pedunculate oak bark	
MPRM, containing cardiac glycosides, thio-and cyanoglycosides	
lily of the valley grass	Foxglove woolly, foxglove purple, adonis, May lily of the valley , jaundice spreading
MPRM, containing saponins	
licorice root	Dioscorea nippon, licorice naked, aralia manchuria
MPRM, containing anthracene derivatives	
senna leaf	Common buckthorn, Cassia hollyleaf, St. John's wort,aloe tree

CHEMICAL FORMULAS FOR PHARMACOGNOSTIC ANALYSIS

Vitamins	Terpenoids	Alkaloids	Glycosides	Phenolic compounds
- ascorbic acid - vitamin K	menthol - menton - cineol - pinen -borniliso-valerianat - isovalerianic acid - acoron - calamen - calacon – arthabsin - artemazulen	- platyphylline - senecifylline - scopolamine - caffeine - papaverine - atropine -morphine - codeine -ethylmorphine - ephedrine - protopin -berberine -chelidonin - capsaicin	- lanatosides A, B,C -convalloside, - convallotoxin -glycyrrhizin - antrone -anthranol - hypericin	-arbutin -methylarbutin- sennosides A, B -rutin - liquiritin - catechin

Determine the main diagnostic signs of medicinal plant raw materials

Micropreparations

1. Adonis herb

2.Althaea root

3. Foxglove leaf

4.Plantine leaf

5.Lily of the valley herb

6.Eucalyptus leaf

7.Licorice root

8.Nettle leaf

9.Oak bark

10.Grass shepherd's purse

11.Senna leaf

12.Grass streak

13Mmint leaf

14.Rhizome with valerian roots

15. Wormwood herb

16.Sheet of belladonna

17.Grass celandine

18. Rose hip

19.Grass grass

20.Grass motherwort

21. Tea leaf

22. Kelp thallus

23.Box of poppy sleeping pills

24.Ephedra herb

25. Bearberry leaf

26. Calamus rhizome

27.The fruit of the capsicum

28. Bearberry leaf

Literature

1. Muravyova D.A. "Pharmacognosy" 1981

2. Muravyova D.A. "Pharmacognosy" 1991

3. Muravyova D.A., Samylina I.A., Yakovlev G.P. "Pharmacognosy", 2002 pp. 159-195.

4. Pharmacognosy "Atlas". 1989

5. Lecture materials for the course "Pharmacognosy"

6. Dolgova A.A., Ladygina E.Ya. "Guide to Practical Exercises in Pharmacognosy" 1977.

7. "Pharmacognosy" "Atlas" 1989.

8. Kuznetsova M.A. "Pharmacognosy"

9. State Pharmacopoeia XI edition, issue 1,2

10. Guide to practical exercises in pharmacognosy: Textbook / Ed. I.A. Samylina, A.A. Sorokina - M: Medical Information Agency, 2007.

11. Muravyova D.A., Samylina I.A., Yakovlev G.P. "Pharmacognosy" 2002

12. Samylina I.A., Anosova O.G. Pharmacognosy. Atlas "I, II volume 2007.

13. Yakovlev G.P. Pharmacognosy. Medicinal raw materials of plant and animal origin ". - St. Petersburg. - Special Lite., 2010, 862s.

Pharmaceutical chemistry

Theoretical stage

1. Sources of obtaining medicinal substances. Mineral, organic, synthetic, medicinal plant raw materials, raw materials of animal origin.

2. The main directions of the creation of new medicinal substances.

3. Obtaining medicinal substances from plant and animal raw materials; based on the use of biological synthesis; organic synthesis.

4. Quality standards for medicines. General monograph, monograph, monograph of the enterprise. Rules for the construction and presentation of quality standards for medicines.

5.State Pharmacopoeia. History, structure, meaning.

6. Regional and national pharmacopoeias. European Pharmacopoeia, Pharmacopoeia of the USA, Britain, Russian Federation, Republic of Kazakhstan, Republic of Belarus, Ukraine.

7. The role of analytical methods in the process of creating and researching new medicinal substances. Physical, physicochemical, chemical and biological methods of analysis.

8. Quality control system in the conditions of chemical and pharmaceutical production. The relationship of quality control with the technological process. The role of the quality control department (technical control department) in the quality control of medicines.

9. Quality control of medicines manufactured in pharmacies. General provisions on intra-pharmacy control. Preventive measures.

10. Internal pharmacy control: definition, types, requirements for the conduct and its results.

11. Assessment of the quality of dosage forms manufactured in pharmacies.

12. Pharmaceutical analysis, its features, criteria. Requirements for pharmaceutical analysis.

13. Analytical assurance of the quality of medicines in accordance with the requirements of international standards. Validation of methods of analysis.

14. Physical properties used to establish the authenticity of medicinal substances.

15. Sources and causes of poor quality of medicinal substances. The nature and nature of impurities (industrial impurities, intermediate products, feedstock).

16. Influence of impurities on the qualitative and quantitative composition of the medicinal product and the possibility of changing its pharmacological activity (specific and general impurities).

17. General and specific methods for detecting impurities. Techniques for setting the limits of permissible impurities based on the degree of sensitivity of chemical reactions (reference and standard-free methods).

18. General tests for impurities of inorganic ions (chlorides, sulfates, ammonium salts).

19. General tests for impurities of inorganic ions (calcium salts, iron (II) and (III), arsenic).

20. Use of refractometry in pharmaceutical analysis (refractive index, refractive index factor, application for authenticity determination, methods for calculating the quantitative content of medicinal substances in one-, two-, multicomponent dosage forms).

21. Polarimetry in pharmaceutical analysis. The essence of the method, application to determine the authenticity, good quality and quantitative content of medicinal substances. The relationship

of optical isomerism with the pharmacological action of drugs by the example of quinine, quinidine, chloramphenicol, etc.

22. Features of the analysis of dosage forms (single-component, multicomponent dosage forms, finished dosage forms, homeopathic medicines). General methodological techniques in assessing the quality of multicomponent dosage forms: the main ways of analyzing complex dosage forms without separation and with the separation of ingredients with their subsequent determination.

23. Stability as a factor in the quality of medicines. Physical and chemical processes occurring during the storage of drugs (hydrolysis, oxidation, isomerization, polymerization, polycondensation).

24. Factors affecting the stability of drugs (light, temperature, humidity, packaging material).

25. Storage conditions and shelf life of medicines. Objectives and types of stability tests. Conditions for studying the stability of new and commercially available drug media of substances. Ways to improve the stability of drugs.

26. Iodine. Write the chemical formula, its Latin name. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

27.Sodium bromide. Write the chemical formula for its Latin name. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

28. Potassium bromide. Write the chemical formula, its Latin name. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

29.Bismuth nitrate is basic. Magnesium oxide. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

30. Ascorbic acid. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

31. Platyphylline hydrotartrate. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

32. Caffeine-sodium benzoate. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

33. Menthol. Write the chemical formula, its Latin and rational names. Physicochemical properties, methods of qualitative and quantitative analysis, storage and use in medicine and form of release.

34. Papaverine hydrochloride. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

35. Atropine sulfate. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

36. Morphine hydrochloride. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

37. Codeine phosphate. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

38. Ethylmorphine hydrochloride. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

39. Glucose. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

40. Ephedrine hydrochloride. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

41. Phenol, thymol, resorcinol. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

42. Propyphenazone. Phenylbutazone. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

43. Phenoxymethylpenicillin. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

44. Sulfanilamide. Sulfathiazole. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

45. Digitoxin. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

46. Theobromine and theophylline. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

47. Phenobarbital and benzobarbital. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

48 Camphor. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

49. Retinol acetate. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

50. Sulfocamphocaine. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

51. Procaine hydrochloride. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

52. Sulfacyl sodium. Write the chemical formula, its Latin and rational names. Describe the physicochemical properties (appearance, solubility, etc.) and their use for quality assessment, methods of qualitative and quantitative analysis, storage and use in medicine and the form of release.

Practical stage.

Solve the task, write the equation of the chemical reaction:

1. According to ND, quantitative analysis of ephedrine hydrochloride is carried out by alkalimetry with 0.1 mol / l NaOH solution in ethanol. Write the reaction equation. Calculate the titer of correspondence (Mr of ephedrine hydrochloride 201.7).

2. Calculate the specific rotation and evaluate the quality of camphor according to this indicator, if the average angle of rotation of a 10% alcohol solution is + 8.4 °. Cuvette length 200.01mm. Specific rotation should be between +41 and + 44 °.

Select the required reagents and conduct an authenticity test. Confirm the answer with the reaction equations.

Perform an FPP analysis.

Algorithm for the task.

1.From the attached list of reagents, select the reagent required for the test, indicated in the procedure by dots.

2. Write the reaction equation.

3. Conduct an authenticity reaction.

4. Present the results to the commission.

1.Glucose solution 20% - 50.0 ml

To 0.5 ml of the solution add 1 ml of the solution ... and ... ... A blue color is formed, turning into orange, then a brick-red precipitate is formed.

2.A solution of ascorbic acid 5% -10.0 ml

Add 3-5 drops of 0.1 mol / l solution to 1 ml of the drug solution…. Discoloration of the latter occurs.

3.Solution of caffeine-sodium benzoate 10% -100.0 ml

Benzoate ion. 3-4 drops. solution add 1-2 ml of water and 2-3 drops. solution…. A pinkish yellow precipitate is formed.

4.Ethyl alcohol

0.5 ml of the preparation is mixed with 5 ml of solution ... .. Add 2 ml of 0.1 N solution ... ... The smell of iodoform appears and a yellow precipitate of iodoform is gradually formed.

5.Potassium bromide solution 3% - 50.0 ml

Bromide ion. To 0.5 ml of the solution add 3 drops. development nitric acid, 3-5 drops solution ..., a yellowish curdled precipitate is formed, insoluble in ded. nitric acid and hardly soluble in solution….

6.Calcium chloride solution 10% for injection

Calcium ion. Add 3-5 drops of the solution to 1 ml of the solution…. A white precipitate is gradually formed, insoluble in dilute acetic acid and ammonia solution, soluble in dilute mineral acids.

Chloride ion. To 0.5 ml of the solution add 3 drops. development nitric acid, 3-5 drops solution ..., a white cheesy precipitate is formed, insoluble in ded. nitric acid and soluble in solution….

7.Potassium iodide solution 2% -50.0 ml

Potassium ion. To 0.5 ml of the solution add 3-5 drops. diluted acetic acid and solution…. A yellow crystalline precipitate is formed.

8.Sodium thiosulfate solution 30% -10.0 ml

Thiosulfate ion. 3-4 drops. solution add 1 ml of water and 3-4 drops…. Gradually, the solution becomes cloudy and sulfurous anhydride is released, which is detectable by smell.

9.Magnesium sulfate solution for injection 25% -10 ml

Magnesium ion. To 1 ml of the preparation add 1 ml of ammonium chloride solution, 0.5 ml of solution ... and 1 ml of 10% solution .... A white crystalline precipitate is formed, soluble in acetic acid.

Sulfate ion. To 1 ml of the drug solution add 0.5 ml of diluted ... ... acid and 0.5 ml of solution ... ..; a white precipitate is formed, insoluble in dilute acids.

10.Aminophylline solution 0.5%

To 2 ml of 0.5% solution add 1 drop of 5% solution…. A violet color appears.

11.Nicotinic acid solution 1% for injection

A nicotinic acid. 1 ml of solution is added to 1 ml of warm solution ...; a blue precipitate is formed.

12.Epinephrine bitartrate solution 0.18% for injection.

Epinephrine. To 1 ml of solution add 1 drop of solution ...; an emerald green color appears, which from the addition of 1 drop of solution ... turns into cherry red, and then into orange red.

13.A solution of atropine sulfate 0.1% for injection.

Sulfate ion. To 0.5 ml of the drug solution add 0.5 ml of diluted ... ... acid and 0.5 ml of solution ... ..; a white precipitate is formed, insoluble in dilute acids.

14.A solution of calcium gluconate 10% for injection.

Calcium ion. Add 3-5 drops of the solution to 1 ml of the solution…. A white precipitate is gradually formed, insoluble in dilute acetic acid and ammonia solution, soluble in dilute mineral acids.

Gluconate ion. 1 ml of the drug is diluted to 10 ml with water. To 5 ml of the resulting solution add 2 drops of the solution .... ; a light green color appears.

15.Alcohol iodine solution 5%

1 drop of the drug is diluted with 10 ml of water and 1 ml of solution is added… .; a blue-blue coloration appears.

16.Sodium chloride solution 0.9% isotonic for injection

Chloride ion. To 0.5 ml of the solution add 3 drops. development nitric acid, 3-5 drops solution ..., a white cheesy precipitate is formed, insoluble in ded. nitric acid and soluble in solution….

17 Pyridoxine hydrochloride solution 1% for injection

To 1 ml of the drug add 2 drops of solution ... ..; a red color appears, which disappears with the addition of diluted sulfuric acid.

18.Sodium sulfacetamide solution 30%

To 1 ml of solution add 1 ml of solution ...; a bluish-greenish precipitate is formed, which does not change upon standing.

19.Glycerol

To 2-3 drops of drugs add 4-5 drops of solutions ... and ... ... An intense blue coloration appears.

20. Diclofenac sodium solution 2.5% for injection

A. To 1 ml of the solution add 2-3 drops of a 3% solution ... - a yellow-brown precipitate is observed.

B. To 1 ml of solution add 2-3 drops of 3% solution ... - white precipitate is observed.

B. To 1 ml of solution add 2-3 drops of a 3% solution ... - a light green precipitate is observed.

List of reagents

1.ammonia solution

2.Ammonium oxalate solution

3.tartaric acid solution

4.0, 1 N iodine solution

5.copper sulphate solution

6.sodium nitrite solution

7.sodium phosphate solution

8.sodium hexanitrocobaltate solution

9.silver nitrate solution

10.solution of ferric chloride

11.development hydrochloric acid

12.starch solution

13.diluted sulfuric acid

14.sodium hydroxide solution

15.barium chloride solution

Literature

1. Belikov V.G. Pharmaceutical chemistry. Textbook. for universities. - M .: MEDpress-inform, 2009 (25 copies), 2006 (8 copies)

2. Belikov V.G. Pharmaceutical chemistry. At 2 pm: Part 1. General Pharmaceutical Chemistry; Part 2. Special pharmaceutical chemistry: Textbook. for universities.- Pyatigorsk, 2003.- 720 p. (4 copies).

3. Pharmaceutical chemistry: Textbook. allowance / Ed. A.P. Arzamastsev. - 2nd ed., Rev. - M .: GEOTAR - Media, 2005 .-- 640 p. (11 copies)

4. Pharmaceutical chemistry. Textbook for universities, ed. Pletenevoy T.V. M .: GEOTAR, 2017 (20 copies).

5.Aksenova E.N., Andrianova O.P., Arzamastsev A.P. and other Guide to laboratory studies in pharmaceutical chemistry / Ed. A.P. Arzamastseva. - M .: Medicine, 2001 .-- 380s.

6. Belikov V.G. Textbook on pharmaceutical chemistry, M., Medicine, 1979

7. Arzamastsev A.P., Aksenova E.N. Guide to laboratory studies in pharmaceutical chemistry, M., Medicine. 1987 year

8. State Pharmacopoeia of the USSR, X edition. - M .: Medicine, 1968.

9. State Pharmacopoeia of the USSR, XI edition.- M., Medicine, 1989

10. State Pharmacopoeia of the Russian Federation, XII edition. - Publishing house "Scientific Center for Expertise of Medicinal Products", 2008.-704 p.

11. State Pharmacopoeia of the Russian Federation, XIV edition. Electronic resource.

12. Saushkina A.S. Collection of problems in pharmaceutical chemistry: A textbook on pharmaceutical chemistry for students of pharmaceutical universities and pharmaceutical faculties of medical universities / Ed. VG Belikova. - Pyatigorsk: Publishing house of PyatGFA, 2003.-274 p., Ill. 5.

13. Kuleshova M.I. and other Analysis of dosage forms manufactured in pharmacies, M., Medicine, 1989

14. Technical regulation "On the safety of medicines for medical use" (PPKR dated April 6, 2011 No. 137).

15. Technical regulation "On the safety of medicines manufactured in pharmacies" (PPKR dated May 26, 2012 No. 320).

16. Technical regulations "On the safe storage of medicines in pharmaceutical organizations and healthcare organizations and the sanitary regime of pharmaceutical organizations" (PPKR dated May 26, 2012 No. 646).

Electronic resource

Site of KSMA named after I.K. Akhunbaev https://www.kgma.kg/index.php/ru/

Kyrgyz Virtual Scientific Library www.kyrgyzstanvsl.org

Electronic resource "Electronic Library" KSMA (library.kgma.kg)

Electronic resources of the eIFL project. http://bik.org.kg/ru/eifl_resources/

Medicine technology

Theoretical stage

1. Pharmaceutical technology as a science. Goals, objectives of the subject. Terminology: state pharmacopoeia, monographs (general, private, temporary), normative document, pharmacological agent, drug, dosage form, drug.

2. Classification of dosage forms by state of aggregation, by method of application, dispersiological classification and method of dosing.

3. Industrial production of drugs. Conditions for the centralized release of medicinal products. The guild principle of drug production organization.

4. Dosing in the technology of dosage forms. Dosing by weight. Factors Affecting Weight Dosing Accuracy. Devices.

5. Types of scales used in drug technology. Metrological characteristics of scales. Dosing rules for free-flowing solids and liquids with different densities.

6. State regulation of drug production. Admission to the production and manufacture of drugs. Standardization of the composition of drug formulations. Establishment of quality standards for medicinal and auxiliary substances for the manufacture of drugs. Standardization of manufacturing conditions and technological processes for drug production.

7. The system of quality assurance of medicines in production. Good Manufacturing Practice (GMP) regulations. The main requirements of GMP for the production of medicines and for the quality control system.

8. Technological regulations and production instructions. Definition. Characteristic. Classification. Main sections.

9. Thermal processes in the production of pharmaceuticals (thermal conductivity, convection, radiation emission). Heat exchangers.

10. Drying characteristics. Drying methods. Forms and types of connection of moisture with the material. Drying kinetics.

11. Theoretical foundations of dissolution. Methods of intensification of dissolution. Mixing, types of agitators. Methods of cleaning solutions (settling, filtering, centrifugation). Equipment.

12. Cleaning of solutions from mechanical impurities. Filtering and filtering of solutions. Filters and devices used for filtering injectable solutions in pharmacies. Filter materials (cotton wool, gauze, filter paper, glass filters). Requirements for filter media.

13. Asepsis. Sanitary requirements for the premises and equipment of the aseptic unit and the production of medicines under aseptic conditions. Preparation of personnel for work and rules of conduct in the aseptic unit. Rules of operation of bactericidal lamps.

14. Sterilization. Methods of sterilization: thermal (steam and air); chemical (gas and solution sterilization); filtration sterilization; radiation. Application. Equipment. Sterility control.

15. Extraction medicines. Characteristic. Extractants used for the preparation of medicines, their requirements. Theoretical foundations of extraction. The main factors of the technology that affect the extraction process.

16. Alcoholimetry. Definition. Features of preparation of water-alcohol solutions. Methods and devices for determining the concentration of ethanol. Determination of the content of anhydrous alcohol in an aqueous alcohol solution. Alcoholimetric tables.

17. Industrial extraction methods: maceration and variants of its modification, percolation, repercolation. Countercurrent extraction, circulation extraction, extraction with liquefied carbon dioxide. Equipment for extraction.

18. Grinding and sieving in pharmaceutical production. Types and methods of grinding. Sieve classification of the crushed material. Shredding machines. The design of the sieves.

19. Mixing of powdery and rugged materials in industrial conditions. Faucets. Classification.

20. Characteristics of powders as a dosage form. Classification. Advantages and disadvantages. Requirements for powders. Technology of preparation of powders with extracts, coloring and hard-to-grind substances. Quality assessment. Registration for vacation.

21. Complex powders. Technology of preparation of complex powders. Rules for the preparation of powders from ingredients written out in equal or approximately equal quantities (substances have the same physical properties, differ in physical properties, easily dispersible substances). Rules for the preparation of powders from ingredients prescribed in different quantities. Quality assessment. Registration for vacation.

22. Characteristics of powders as a dosage form. Classification. Advantages and disadvantages. Requirements for powders. Technology of preparation of powders with toxic substances. Triturations, their preparation and purpose. Checking the doses of toxic substances in powders. Quality assessment. Registration for vacation.

23. Liquid dosage forms. Characteristic. Classification according to the method of application, the complexity of the composition, the nature of the solvent, and the type of dispersed systems.

24. Water solutions. Characteristics of solutions. Methods of writing out and designating the concentration in solutions. Checking the doses of toxic and potent substances in medicines. Methods of preparation of solutions.

25. General scheme of solution technology. General rules of manufacture, the sequence of dissolution and mixing of medicinal substances in liquid dosage forms. Changes in the total volume in the mass-volume production of solid medicinal substances. The concept of the volume increase coefficient.

26. Features of the preparation of solutions from large-crystal substances that are slowly soluble in water (boric acid, magnesium sulfate, furacilin). Solutions of oxidizing agents (potassium permanganate, silver nitrate). Features of preparation of solutions from substances hardly soluble in water. Solutions of substances that require excipients for dissolution (crystalline iodine, mercury diiodide). Packaging, design, quality assessment.

27. Concentrated solutions. Conditions and technology of preparation of concentrated solutions for the burette plant. Calculation of the dry matter mass. Calculation of the volume of water, taking into account the volume increase factor. Strengthening and dilution of solutions. Quality assessment and storage.

28. Features of the preparation of medicines using concentrated solutions. The procedure for introducing tinctures, liquid extracts, and syrups into the medicine. Packaging, design, quality assessment.

29. Drops as a dosage form. Characteristic. Classification. Advantages and disadvantages. Features of the drip technology. Checking the doses of toxic and potent substances in drops for internal use. Quality assessment.

30. Infusions and decoctions. Requirements for water extractions. Advantages and disadvantages. General rules of the technology. Factors that affect the completeness and speed of extraction of active substances from medicinal plant raw materials: standardness, grinding of raw materials, the ratio of the amount of raw materials and extractant, the kinetics of extraction. Water absorption coefficient. The principle of operation of infundirny devices.

31. Stages of technology of infusions and decoctions from vegetable raw materials. Features of the technology of infusions from medicinal plant raw materials containing alkaloids, tannins, essential oils, mucus, saponins. Introduction to infusions and decoctions of medicinal substances.

32. Liniments. Characteristic. Classification. Requirements for liniments. Technology of preparation of homogeneous, suspension and emulsion liniments. Quality assessment. Packaging, design.

33. Ointments as a dosage form. Characteristic. Classification. Bases for ointments: lipophilic, hydrophilic, lipophilic-hydrophilic. Requirements for ointments and ointment bases.

34. Technological stages of making ointments in pharmacies. Homogeneous ointments. Cooking technology. Assessment of the quality of homogeneous ointments.

34. Technological stages of making ointments in pharmacies. Homogeneous ointments. Cooking technology. Assessment of the quality of homogeneous ointments.

35. Heterogeneous ointments. Features of the technology of suspension ointments with a dry matter content of up to 5% and more than 5%. Features of the technology of emulsion and combined ointments. Quality assessment.

36. Solutions for injection. Technological stages of preparation. Stabilization of solutions for injection: solutions containing salts of weak bases and strong acids, salts of weak acids and strong bases, solutions of easily oxidizing substances (procaine, caffeine-sodium benzoate, ascorbic acid).

37. Plasma-substituting and infusion solutions. Characteristic. Classification. Requirements for plasma-substituting solutions. Isotonicity requirement for infusion solutions, methods for calculating the isotonic concentration (using the isotonic equivalent for sodium chloride).

38. Eye drops. Characteristic. Requirements for eye drops. Features of the technology of manufacturing eye drops by dissolving medicinal substances and using concentrated solutions. Quality assessment.

39. Dosage forms with antibiotics. Classification. General requirements for dosage forms with antibiotics. Features of the technology of ointments, suppositories, powders with antibiotics. Packaging, registration for the holiday. Quality assessment.

40. Tablets. Characteristic. Types and nomenclature of tablets. The positive and negative sides of tablets. Theoretical foundations of tableting (mechanical theory, sintering theory, cold welding theory, capillary-colloidal theory, electrostatic theory).

41. The main groups of excipients used in the production of tablets. Characteristics, requirements. The effect of excipients on the therapeutic effectiveness of medicinal substances of tablets.

42. The technological process of obtaining tablets by direct pressing and with the addition of excipients. Tablet machines. Comparative characteristics of tablet machines, the principle of their operation.

43. Types of medical capsules: hard with caps, soft. The range and properties of excipients used in the production of capsules. Production methods. Filling and sealing of capsules.

44. Microcapsules. The main goals of microencapsulation. Excipients used in the production of microcapsules. Methods of obtaining and applying microcapsules.

45. Aerosols. Characteristic. Classification. Excipients for the production of aerosols. Propellants. Requirements for propellants.

46. Liquid extracts. Characteristic. Nomenclature. Methods of obtaining. The technological process of production. Clearing. Quality assessment. Storage.

47. Thick and dry extracts. Characteristic. Nomenclature. Methods of obtaining. Extractants. The technological process of production. Clearing extracts. Quality assessment.

48. Novogalene preparations. Nomenclature. Extraction methods. Extractants. Cleaning methods for obtaining the most purified preparations. Quality assessment and storage.

49. Preparations of individual substances of plant medicinal raw materials. Classification. Technology of preparation of individual substances.

50. Biopharmaceuticals, as a section of the technology of dosage forms. Pharmaceutical factors: physical state of medicinal substances; chemical modification of the drug; excipients, their nature, quantity; type of dosage form and route of administration; pharmaceutical technology.

Practical stage

A) Situational and computational tasks

1. Instead of 100 kg, 97.5 kg of granulate tablets of morphine sulfate 0.005 g were obtained. Make up the equation of material balance. Find the output, expenditure, and expense ratio.

2. For the preparation of licorice root syrup, the pharmaceutical plant prepared a simple sugar syrup with a sugar content of 59%. Why can't this syrup be used to make licorice root syrup? How to bring this syrup to the norm (sugar content of 64%)?

3. In the production of Ingalipt, 95% alcohol is used. How much 96.3% alcohol will it take to make 150 liters of 95% alcohol?

4. Composition of 1 tablet:

- digitoxin 0.0001 g

- excipients until a tablet weighing 0.100 g is obtained.

Calculate the amount of digitoxin needed to prepare 150,000 tablets. Take into account the consumption coefficient equal to 1.025.

5. To obtain plantaglucide granules, your company received 200 l of rectified alcohol. The glass alcohol meter at + 15 ° C shows a value of 95.0. What is the concentration of the resulting alcohol?

6. How much phenobarbital substance is needed to prepare 250,000 tablets of phenobarbital 0.1? The expense ratio is 1.072.

7. The composition of the tablets "Vikair" includes the following active ingredients: bismuth nitrate basic 0.35 g; magnesium carbonate basic 0.40 g; sodium bicarbonate 0.20 g; buckthorn bark (powder) 0.025 g; calamus rhizomes 0.025 g (powder) and excipients: starch, talc and stearic acid.Calculate how much you will need each active component to prepare 50 tablets of "Vikair".

8. To obtain the ointment "Eucamon", you need a tincture of capsicum. Calculate the required amount of raw materials and extractant for the preparation of 250 liters of tincture of capsicum by percolation.

Note: The absorption coefficient is 2.0.

9. You need to determine the density of the retinol acetate solution. What do you need to do this? What method will you use to conduct the test?

10. Calculate how much you need to take each component to prepare 250 liters of a 10% sulfocamphocaine solution. The expense ratio is 1.012.

Composition:

Sulfocamphoric acid 49.6 (in terms of anhydrous)

Novocaine-base 50.4

Water for injection - up to 1 l.

11. 20 g of thick dandelion extract with a moisture content of 30% was obtained. Determine to what mass this extract should be evaporated to bring it to a moisture content of 25%.

B) for the following recipes:

- make calculations, write the PWC,

- theoretically substantiate the technology of manufacturing these prescriptions,

- perform practical tasks for weighing powders, packing them, preparing them for release,

- perform practical tasks for preparing solutions and medicines.

The practical part. The algorithm for solving recipes for TLC.

Take: Camphor 0.05

Sugar 0.5

Mix to make a powder. Give these doses to №10.

Label: 1 powder 3 times a day.

1. Make calculations and form a passport of written control.

Camphor: $0.05 \times 10 = 0.5$ g

Sugar: $0.5 \times 10 = 5.0$ g

Passport

1. Sugar 5.0 g

2. Camphor 0.5 g

3. Ethyl alcohol 95% 5 drops

General volume 5.5 g

P = 0.55 No. 10

Prepared it:

Checked it out:

Released:

2. Substantiate the manufacturing technology and prepare this recipe.

The powder is complex, dosed, and dispensed by the distribution method. Camphor belongs to hard-to-grind substances, has a strong characteristic smell, and is easily sublimated at normal temperature. Easily soluble in 95% alcohol.

To grind camphor, it is necessary to use an auxiliary liquid-95% ethanol (10 drops per 1 g).

Technology: In a mortar, rub 5 g of sugar, pour it on a paper capsule. In a mortar, put 0.5 g of camphor, 5 drops of 95% ethanol and rub. Add sugar from the capsule in an amount approximately equal to the amount of camphor. Then, in 2-3 steps, add the remaining amount of sugar, rubbing the mixture until smooth.

With the help of hand scales and capsulatorki, we hang the total mass of the powder into doses weighing 0.55 g with the number 10, placing them on parchment capsules (waxed and paraffinized can not be used, since camphor is soluble in oils).

3. Apply for the release of this dosage form.

The pre-packaged powder is placed in a cardboard box or paper bag, we stick a green label "Internal" with the inscription "Powders". On the label, specify the number of the pharmacy, the patient's name, composition, method of use, date of manufacture, expiration date of the dosage form.

Literature

1. Pharmaceutical technology. Manufacturing of medicinal products: textbook / A. S. Gavrilov. - M.: GEOTAR-Media, 2010 – - 624 p.

2. Krasnyuk I. I. Pharmaceutical technology: Technology of dosage forms: Textbook for students. environments. Professor of education, institutions / I. I. Krasnyuk, G. V. Mikhailov, E. T. Chizhov; Under the editorship of I. I. Krasnica and G. V. Mikhailova. — M.: Publishing center "Academy",2004. — 464 p. 2004 (4 copies)

3. I. I. Krasnyuk, G. V. Mikhailov, O. N. Grigoriev, Yu. I. zeligson etc. "Practicum on the technology of dosage forms", Moscow: Akademiya, 2007.

4. Technology of dosage forms. Textbook in 2 volumes. Volume 1, 2/ T. S. Kondratieva, L. A. Ivanova, Yu. I. Zelikson et al.; Edited by T. S. Kondratieva. - M.: Meditsina, 1991. (110 copies.)

5. Industrial medicine technology: [Textbook. In 2 volumes. Volume 1. V. I. Chueshov, O. I. Zaitsev, S. T. Shchebanova, M. Yu. Chernov]; edited by Prof. V. I. Chueshov. - Kharkiv: MTK-Kniga. 2002 – - 560 p.

6. Industrial medicine technology: [Textbook. In 2 volumes. Volume 2. V. I. Chueshov, M. Yu. Chernov, L. M. Khokhlova, etc.]; edited by Prof. V. I. Chueshov. - Kharkiv: MTK-Kniga. 2002.

7. GF-X, GF - XI, GF-XIV editions and other pharmacopoeias.

8. Technical Regulations "On the safety of medicines for medical use" (PPCR No. 137 of 06.04.2011).

9. Technical Regulations "On the safety of medicines manufactured in pharmacies" (PPCR No. 320 of 26.05.2012).

10. The technical regulation "On safe storage of medicines in the pharmaceutical organizations and the organizations of health care and sanitary mode pharmaceutical organizations" (ppkr No. 646 dated 25.09.2012).

11. The resolution of the Government of the KR dated January 5, 2011 # 2 "On approval of the procedure of prescriptions for medicinal products and their vacation in the Kyrgyz Republic".

12. CMS 1251:2013 " Medicines. The procedure for the development and approval of technological regulations of production. Basic provisions".

13. Guide to laboratory classes on pharmacy technology of dosage forms. M: Medicine, 1986.

14. A. I. Tentsova "Guide to laboratory classes on factory technology of dosage forms" M., Meditsina,1986.

15. L. A. Ivanova "Technology of medicinal forms" M., Meditsina, 1991

16. CMS 1256:2013 " Medicines. Packaging, labeling, transportation, and graphic design. Basic provisions".

17. Website of the KSMA named after I. K. Akhunbayev https://www.kgma.kg/index.php/ru/

18. Kyrgyz Virtual Scientific Library www.kyrgyzstanvsl.org

19. Electronic resource "Electronic Library" of KSMA (library.kgma.kg)

20. Electronic resources of the eIFL project. http://bik.org.kg/ru/eifl_resources/

Pharmacy Management and Economics

Theoretical tour.

1. Regulatory and legal support of the healthcare system and the pharmaceutical service. Legislative acts regulating legal relations in the field of pharmaceutical activity. The Law of the Kyrgyz Republic "On the circulation of medicines". Basic principles and provisions.

2. State regulation of relations arising in the sphere of circulation of medicines. Ways of state regulation, brief description.

3. State registration of medicines. Registration objects. Rules and procedure for state registration of medicines. State Register of Medicines of the Kyrgyz Republic.

4. Assessment of the quality of medicines. The procedure for evaluating the quality of medicines. Criteria for exemption from batch control.

5. The Law "On the Licensing and Licensing System". The concept of a license. Types of licenses. Regulatory and legal documents on licensing. The procedure for licensing activities in the field of circulation of medicines. Characteristics of the documents required to obtain a license for pharmaceutical activities.

6. Organizational foundations of entrepreneurship in the pharmaceutical business. Forms of commercial and non-profit organizations. Legal entities. The procedure for their state registration. Entrepreneurship without the formation of a legal entity.

7. Health care financing systems. Factors affecting the amount of health care funding. Sources of healthcare financing. Health care financing system of the Kyrgyz Republic.

8. Formation and development of the "Single Payer" system. The purpose of the introduction and the principles of functioning of the "Single Payer" system. Participants in the "Single Payer" financing system.

9. The program of state guarantees for providing citizens of the Kyrgyz Republic with health care. The purpose of the State Guarantee Program. Free and preferential drug provision for citizens of the Kyrgyz Republic at the outpatient level in certain diseases and in the provision of inpatient care. Categories of citizens who have the right to receive health care under the State Guarantee Program. The concept of co-payment for medical services provided by healthcare organizations operating in the "Single Payer" system.

10. Medical insurance of citizens in the Kyrgyz Republic. The Law "On Medical insurance of citizens in the Kyrgyz Republic". The concept and types of health insurance. Basic state health insurance: purpose, principles, program, subjects, sources of funding.

11. The system of compulsory health insurance (CHI) in the Kyrgyz Republic. The purpose, objectives, principles and program of the MHI. Subjects of compulsory health insurance: persons subject to compulsory health insurance; payers of contributions to compulsory health insurance. Sources of formation of MHI funds.

12. Management of the CHI system. Health Insurance Fund, territorial management bodies of the MHI Fund. The rights and obligations of the subjects of the MHI system (insured persons; policyholder; providers of medical and pharmaceutical services).

13. Preferential medical provision of the population at the outpatient level under the Program of state guarantees and the Additional Program of compulsory medical insurance. The purpose, principles, and subjects of preferential drug provision. The principle and sources of financing of preferential drug provision programs. Medicines that are reimbursed under preferential treatment programs. Principles of the selection of medicines for the formation of the Directory of medicines.

14. Rules for prescribing and dispensing medicines under programs of preferential drug provision. Reimbursement to pharmacies for dispensed medicines under preferential drug provision programs.

15. Requirements for pharmacy organizations participating in the provision of medicines under preferential drug provision programs. Reporting of pharmacies operating under preferential drug supply programs.

16. Public procurement of goods, works and services. The Law of the Kyrgyz Republic "On Public Procurement". Basic principles and provisions. The main participants in the procedures of public procurement of goods, works and services: purchasing organizations, tender commissions of purchasing organizations, suppliers (contractors).

17. Stages of public procurement. Methods of public procurement: one-stage, two-stage, simplified, at a lower price, direct conclusion of the contract. The main provisions of each contest.

18. The procedure for purchasing medicines and medical devices in a medical institution. The purpose of the procurement, the main participants in the procurement procedure, the exclusion from participation in the tender, the list of specific documents, the cycle and main stages of the purchase of medicines and MI.

19. Tax system of the Kyrgyz Republic. The main provisions of the Tax Code. Direct and indirect, national and local taxes. What types of taxes are imposed on pharmaceutical companies when selling medicines, dietary supplements, and MI?

20. Labor Code of the Kyrgyz Republic. The main provisions of the Labor Code of the Kyrgyz Republic. Tasks of the Labor Code. Labor contracts. The emergence, modification and termination of an employment relationship.

21. Organization of labor and wage accounting. Forms of remuneration. Payroll calculation. Payroll taxes.

22. Organization of the activities of the wholesale level of the pharmaceutical market. Classification of wholesale trade enterprises. Application of logistics in the field of drug circulation. Product distribution channels.

23. Rules of good practice for the wholesale sale of medicines. (GDP-Good Distribution Practice). Approximate organizational structure of a pharmacy warehouse. Placement standards, equipment equipment regulations. Personnel of the enterprise of wholesale trade of medicines.

24. Sources of receipt of goods. Criteria for selecting suppliers. Movement of pharmacy products in the warehouse of wholesale pharmaceutical companies. The procedure for documenting the receipt and release of goods from the warehouse.

25. Safety requirements for the process of disposal of medicines. Methods of neutralization and destruction of medicines and medical devices that have fallen into disrepair. Features of the destruction of toxic, narcotic drugs and psychotropic substances.

26. Organization of the retail pharmaceutical market. Rules and procedures for the retail sale of medicines and other products of the pharmacy range. Safety requirements for the retail sale of medicines.

27. Basic Principles and requirements of Good Pharmacy Practice (GPP). The nomenclature of pharmacy organizations. Classification of pharmacy organizations by form of ownership, organizational and legal norms and production activities.

28. Basic requirements for pharmacy organizations (pharmacy, pharmacy point, pharmacy kiosk). Tasks and functions of the pharmacy. Pharmacy of production and non-production type. Approximate organizational structure of a pharmacy. Standards of placement, equipment and regulatory legal acts. Reception, storage and implementation of drugs. Pharmacy staff.

29. Basic requirements for a pharmacy of a medical and preventive organization. Tasks and functions. Placement standards. Equipment with the necessary equipment and regulations. Reception, storage and implementation of drugs. Staff.

30. Safety requirements for the sanitary regime in pharmacy organizations. Sanitary requirements for the premises, equipment and personnel of pharmacies. Sanitary maintenance of premises, equipment, and inventory in the manufacture of non-sterile dosage forms.

31. Organization of the work of the aseptic unit. Sanitary requirements for the premises and equipment of the aseptic unit and the production of medicines under aseptic conditions. Preparation of personnel for work and rules of conduct in the aseptic unit.

32. Organization of the pharmacy's work on receiving prescriptions and dispensing medicines. Rules for prescribing and dispensing medicines. Forms of prescription forms and their registration, registration. The expiration date of the recipes. Pharmaceutical examination of the prescription. Taxing recipes and the order of their registration.

33. Organization of the manufacture of medicines in pharmacies. Functions of the prescription and production department. Intra-apical preparation and packaging. Registration of medicines manufactured in pharmacies. Regulatory legal acts regulating the manufacture of medicines in pharmacies.

34. State control over activities in the field of legal trafficking of narcotic drugs, psychotropic substances and precursors. Rules for the release, storage, and accounting of narcotic, toxic, and psychotropic drugs.

35. Subject-quantitative accounting of drugs in pharmacies. The list of medicines subject to subject-quantitative accounting in pharmacy organizations. Natural decline and accounting procedure.

36. Economic accounting, its role and significance in the management system of pharmacy organizations. Types of accounting (operational, statistical, accounting, financial, management) and accounting meters.

37. Accounting. Regulatory regulation of accounting. Accounting tasks. Objects of accounting, their characteristics. Method and elements of the accounting method

38. The balance sheet, its types. Balance sheet structure: assets, liabilities, equity. Chart of accounts.

39. Non-current assets. Fixed assets. Definition, classification. Features of accounting for fixed assets. Depreciation of fixed assets. Methods for calculating depreciation.

40. Non-current assets. Accounting for intangible assets. Classification. Basic principles of accounting for intangible assets (IA). Trademarks and trade names. Valuation and depreciation of IA. Traffic accounting and inventory of inventory items.

41. Current assets. Accounting of material and production stocks. Documentation of the acceptance of goods from suppliers. Criteria for selecting a supplier. Rules for accepting goods at the pharmacy. Features of obtaining, registering and accounting for alcohol, toxic and narcotic drugs.

42. Current assets. Cash accounting. Documenting the arrival and consumption of goods and materials. Incoming and outgoing cash transactions. Forms of non-cash payments. Registration of primary documents for settlements with the budget, suppliers and buyers.

43. Inventory, inventory tasks. Types of inventory. The general procedure for conducting inventory in a pharmacy organization.

44. Economic characteristics of the price. Types and functions of the price. Classification of factors that affect the price. Basic pricing methods.

45. Product range, its characteristics: width, depth, comparability of the product. Inventory planning methodology. Managing the product range of a pharmaceutical company using ABC and XYZ analyses.

Practical tour

Situational and calculated tasks

1. The pharmacy purchased 10 kg of papaverine hydrochloride during the reporting period. During the monthly inventory, it was revealed that the book balance of papaverine hydrochloride at the end of the month was 3.4 kg, the actual balance was 3.3 kg. According to the outpatient prescription, 2.7 kg were consumed. What calculations need to be made to complete the inventory. What documents need to be issued.

2. Fill in the appropriate accounting log of ethyl alcohol at the end of the month, if at the beginning of the month its balance was 10 kg, the organization purchased 20 kg during the month, 15.3 kg was used for the production of dosage forms according to the extemporal formulation.

3. To obtain purified water in the pharmacy, there is an aquadistillator purchased for 150,000 SOM. The useful life is established by the technical certificate in 10 years. The average annual amount of purified water consumed by the pharmacy is 700l. For 10 years of use, the distiller should produce 700x10= 7000 liters. During the first year of use, 800 liters of purified water were actually obtained. Calculate the annual depreciation amount using the production method.

4.From the head of the pharmacy at the end of the shift, the proceeds in the amount of 50000som were handed over to the cashier. Specify the documents for this operation, by whom they are carried out. At the beginning of the day, the balance in the cash register was 3900 soms. 1000 soms were issued for the report. The proceeds were handed over to the bank in the amount of 20,000 rubles. Calculate the final balance.

5. When creating an LLC, the founders declared the authorized capital in the amount of 1 million rubles.at the same time, contributions were made in the form of: intangible assets - 50 000 soms, fixed assets 200 000, cash deposit to the current account 500 000, the debt of the founders is 250 000 soms. Issue these transactions in the accounting department and enter them in the balance sheet.

6. After the destruction of 12 kg of substandard medicinal products, the commission documented the fact of destruction. The compiled document in one copy was sent to the DLO and MT of the Ministry of Health of the Kyrgyz Republic, and the second one remained with the owner of the destroyed inventory items. Name this document and explain how to fill it out.

7. Calculate the salary and deductions from the salary of the pharmacist for the month worked, if her salary is 14 thousand soms. The accounting department has documents for granting benefits for two children. The number of working days in this month is 26, 26 days worked.

8. Calculate the number of dispensed GLS for the year by the pharmacy, if the average cost of 1 GLS in the 1st quarter was 25.3 soms, in the second quarter 24.4 soms, in the 3rd quarter 27.5

soms, in the 4th quarter 31.2 soms. The total turnover of the pharmacy amounted to 4 million 300 thousand SOM. Turnover of quarters: 27%, 24%, 23%, 26%.

9. The accounting department received a written order from the head of the transfer 100,000 soms to the settlement account of the pharmaceutical plant for the delivery of the goods. How is this operation documented?

10. Calculate the vacation pay to the pharmacist Kasymova A.M. The monthly salary is 14,000 soms, the bonuses received for this period are 9 thousand soms.

11. The pharmaceutical organization under the contract of assignment of rights in April of this year acquired a patent for the manufacture of ointment worth 200 000 SOM. The patent is valid for 28 months. The pharmaceutical organization expects that during this period, 2,800 packages of ointment will be manufactured and sold. Actual production and sales amounted to: in the 1st year, sales for May-December amounted to 960 units, in the 2nd year-1058 units, in the 3rd year-782 units. What will be the annual amount of depreciation and will it change?

12. Calculate the salary and deductions from the salary of the employee of the chemical and pharmaceutical enterprise Ivanov R. T. for the month worked, if his salary is 17,000 soms. The number of working days in this month is 25, 25 days worked.

13. Calculate the natural loss of the powder if:

1) book balance at the end of the month – 10.8 kg

2) the actual balance is 10.6 kg.

3) the consumption for the outpatient formulation and for the production of intra-apical billets was 8.4 kg;

4) 6.8 kg was transferred from the inventory department to the assistant room.

14. A graduate of the Faculty of Pharmacy of KSMAA decided to open a pharmacy organization. What document gives him the right to engage in pharmaceutical activities? What documents must be issued to obtain a permit to engage in this type of activity?

15. An employee of the pharmacy warehouse must fill out a document to send a completed batch of goods on the basis of the order-the buyer's request. Specify what kind of document it is, the order of its filling.

16. Akramova K. T., a graduate of the Faculty of Pharmacy of KSMU, addressed the management of the chemical and pharmaceutical enterprise with an application for employment. After the interview, the manager decided to hire her. Document the employment procedure.

17. Draw up a relevant document for the procedure of dismissal from work of the head of the warehouse of the pharmaceutical organization LLC "Delta-Pharm" on the basis of the submitted application under Article 82 of the Labor Code of the Kyrgyz Republic "At your own request".

18. A medicinal substance was delivered to the railway station in the name of the director of the company. On the basis of what the pharmaceutical company has the right to work with this LV? The director of the company sent a pharmacist to get the accompanying documents and goods. At the station, the pharmacist was refused to issue the goods. Explain the reason for the refusal, which document is required in this case.

19. What documents are issued when the pharmacy receives substances. Give a description of these documents.

Recipes

1. Take: Riboflavin 0.005

Ascorbic acid 0.1

Sugar 0.3

Mix, let the powder be made

Give such doses of the number 5

Label: 1 powder 3 times a day

2. Take: Platyphylline hydrothartrate 0.005

Papaverine hydrochloride 0.04

Aminophylline 0.2

Mix it to make a powder

Give such doses of the number 12

Label: 1 powder 3 times a day

3. Take: Sodium bromide 3.0

Tincture of Valerian

Tinctures of motherwort equally in 10 ml

Mix it. Give . Label : 10-20 drops for pain.

4. Take: Sodium bromide 1.0

Caffeine-Sodium Benzoate 1.0

Purified water 100 ml

Mix it. Give . Label: 1 tablespoon 3 times a day.

5. Take: Iodine 0.25%

Potassium iodide 0.5

Mix 50 ml of purified water

. Give . Label: For greasing the gums.

6. Take: Phenol 0.2

Menthol 0.3

Sunflower oil 20.0

Mix.Give. Label : Rubbing for the hand.

7. Take: Papaverine hydrochloride solution 2 % 2 ml

Give such doses of No. 10 in ampoules.

Label: 2 ml intramuscularly.

8. Take: Atropine sulfate 0.00025

Papaverine hydrochloride 0.01

Sugar 0.2

Mix it to make a powder

Give such doses of the number 10

Label: 1 powder 3 times a day

9. Take: Infusion of rhizomes with valerian roots from 3.0-100ml

Potassium Bromide – 3.0

Mix.Give. Label: 1 tablespoon 3 times a day.

10. Take: 2% potassium bromide solution-200 ml

Sodium bromide-3.0

Tinctures of Lily of the valley – 6 ml

Adonizide – 5 ml

Mix it. Give it to me. Label: 1 tablespoon 3 times a day.

11. Take: Morphine sulfate tablets-0.005

Give these doses № 10.

Label: 1 tablet for pain.

12. Take: Codeine phosphate-0.2

Sodium bromide solution 2% - 200 ml

Valerian tinctures

Tinctures of the lily of the valley equally in 10 ml

Mix . Give. Label: 1 spoon 3 times a day.

13. Take: Ethylmorphine hydrochloride-0.1

Infusion of marshmallow root-180 ml

Sodium Bicarbonate

Sodium benzoate equally by 2.0

Mixt. Give. Label: 1 spoon 3 times a day

14. Take: Glucose solution 5% 10 ml

Ascorbic acid 0.05

Mix . Give . Label : 2 drops 2 times a day in both eyes

List of forms for solving situational tasks in the UEF

1. The order on carrying out the inventory
1. Inventory inventory of inventory items
2. Act of inventory of valuables
3. Employment Order
4. Personal personnel record sheet
5. Specialist Certificate
6. Timesheet
7. Employment contract
8. Dismissal order
9. Power of Attorney
10. Book of issued powers of attorney
11. Invoice
12. Certificate of conformity
13. Liability Agreement
14. Purchase and sale agreement
15. Delivery agreement
16. Business trip certificate
17. Advance report
18. The act of debiting

19. Act of destruction

20. License

21. Certificate of state registration of a legal entity

22. Certificate of acceptance and transfer of fixed assets

23. Inventory card of fixed assets

24. Journal of fixed assets accounting

25. Cash register

26. Cash receipt order

27. Cash withdrawal order

28. Payment request

29. Payment order

30. Payment statement.

31. Invoice to be paid

32. Book of accounting of narcotic drugs, psychotropic, potent, toxic substances

33. The book of subject-quantitative accounting

Algorithm for conducting a pharmaceutical examination of a prescription according to the UEF

1. Compliance with the form of the prescription form of the drug prescription:

a) The form of the drug-1;

b) A special prescription form for a narcotic drug, which has a stamp and a medical device code, serial number and degree of protection;

c) Form 109 of the MHI, PGG for insured citizens.

2. Availability of mandatory and additional banking details:

Mandatory details: the stamp of the medical institution indicating the name of the institution; The patient's full name, age, date of prescription; The doctor's full name, the name of the ingredients, their quantity, method of use, the signature and personal seal of the doctor, the expiration date of the prescription.

Additional details: the seal of the medical institution "For prescriptions", the stamp of the medical institution, the signature of the head of the medical institution; "For a special purpose"; "For a chronic patient".

For the MHI prescription, PGG – form 109 of the MHI: the LPU code, the HS code, the doctor's code, the doctor's full name, the date of prescription, the certificate number, the patient's category, the patient's full name, the date of birth, gender, diagnosis, the ICD-X code(international classification of diseases X), the course dose, the dosage form code, the drug code, the signature and personal seal of the doctor.

3. The authority of the person who wrote the prescription:

For doctors – personal seal, signature;

For private practitioners – personal seal, signature, validity period and license number, date of issue, phone number, in the form of a stamp or printed in a typographic way;

For doctors of the GSV/CSM – the doctor's code, personal seal, signature.

4. The correctness of the registration of the prescription and the method of application.

5. Compatibility of ingredients.

6. Compliance of prescribed doses of toxic and potent substances (VRD, VSD).

7. Compliance with the maximum permissible standards for the release of medicines for one prescription, for which the release rate is established.

8. The validity of the prescription.

9. Taxing the recipe

A prescription written out correctly is taxed, i.e. its retail price is determined. The retail price for extemporal dosage forms and intra-apical preparation consists of the cost of the initial ingredients, the cost of pharmacy utensils and the tariff for the manufacture of the drug (taxalaborum).

For example,

0-87 Take: Aminophylline 0.01

0-62 Sugar 0,2

1-17 Mix to make a powder

14-15 Give such doses No. 15

0-75 Label: 1 powder 2 times a day.

17-56

The cost of the ingredients included in the recipe can be found from the price list set by various pharmacy organizations themselves. By drawing up a simple mathematical proportion (kilograms are converted to grams, and liters to milliliters). For example, 1000 g of sugar costs 50 soms, and according to the recipe, you need 0.2 g of sugar, which means 0.2 soms (unknown). As a result, sugar for this recipe needs 0.01 som. To the sum of the cost of the ingredients (0.87 + 0.62), we add the cost of auxiliary materials. N: capsulatorki, packages or boxes, labels (in the sum is equal to 1s 17t) and the tariff for the manufacture of powders (taxolaborum): 14 with 15t for 10 powders + 15t for each subsequent powder (15*5=75).

Total cost of powders:0,87+0,62 1,17+14,15+0,75= 17 see 56 tiyins

Literature:

1. Lecture material on the UEF course.

2. Management and economics of pharmacy: In 4t. T. 1. Pharmaceutical activity. Organization and regulation: Textbook for students of higher educational institutions. I. V. Kosova, E. E. Loskutova, T. P. Lagutkin, etc. Ed. by E. E. Loskutova-M.: Publishing Center "Academy", 2003-384s.

3. Management and economics of pharmacy: In 4t. t. 2. Accounting in pharmacy organizations: operational, accounting, tax: Textbook for students. higher. studies. Institutions / A. A. Teodorovich, E. E. Loskutova, E. A. Maksimkina, etc.; Ed. by E. E. Loskutova. - M.: Publishing Center "Academy", 2004-448 p.

4. Management and economics of pharmacy: In 4 vols. 3. Economics of pharmacy organizations: textbook for students of higher educational institutions. V. V. Dorofeev et al., ed. by E. E. Loskutova-2nd ed., ster. - M.: Publishing Center "Academy", 2008. - 432 p.

5. Management and economics of pharmacy: Textbook/Ed. by V. L. Bagirova. – M.: JSC "Publishing house "Medicine", 2004.

6. Basic Economics pharmacies: a textbook for students of higher educational institutions. Z. A. Savel'eva, Z. I. Zaitseva, O. V. Kartashov.- M.,2003 – 180.with.

7. The law No. 165 of 02.08.17.g "On circulation of medicines".

8. Technical Regulation " On the safety of medicinal products for medical use "(PPCR No. 137 of 06.04.2011).

9. Resolution of the Government of the Kyrgyz Republic No. 312 of July 5, 2018 "On approval of the Procedure for assessing the quality of medicines"

10. Law of the Kyrgyz Republic No. 66 of 22.05.98. g ." On narcotic drugs, psychotropic substances and precursors".

11. Resolution of the Government of the Kyrgyz Republic of June 13, 2017 No. 362 Temporary Regulation "On Licensing of Activities for the Development, Production, Manufacture, Processing, Storage, Release, Sale, Acquisition, Use, Trade and Distribution of Narcotic Drugs, Psychotropic Substances and Precursors in the Kyrgyz Republic»

12. Law of the Kyrgyz Republic No. 195 of October 19, 2013 "On the Licensing and Licensing System in the Kyrgyz Republic»

13. Law of the Kyrgyz Republic No. 6 of 09.01.2005 "On the protection of the health of citizens of the Kyrgyz Republic".

14. Law of the Kyrgyz Republic No. 112 of 18.10.1999 "On medical insurance of citizens in the Kyrgyz Republic".

15. Law of the Kyrgyz Republic No. 159 of 30.07. 2003 "On the Single payer system in the financing of healthcare in the Kyrgyz Republic"

16. Law of the Kyrgyz Republic No. 72 of 03.04.2015 "On Public Procurement".

17. Law of the Kyrgyz Republic of April 29, 2002 N 76 "On Accounting".

18. The Labor Code of the Kyrgyz Republic (adopted by the Legislative Assembly of the Jogorku Kenesh of the Kyrgyz Republic on 25 May 2004).

19. Tax Code of the Kyrgyz Republic No. 231 of October 17, 2008.

20. Resolution of the Government of the Kyrgyz Republic No. 376 of July 8, 2014 " On approval of the Program of the Government of the Kyrgyz Republic for the Development of the Sphere of circulation of medicines in the Kyrgyz Republic for 2014-2020»

21. Resolution of the Government of the Kyrgyz Republic No. 747 of 11.11.02. "Regulations on the Department of Drug Supply and Medical Equipment under the Ministry of Health of the Kyrgyz Republic".

22. Kyrgyz Accounting Standard (approved by Order of the Ministry of Finance of the Kyrgyz Republic of October 1, 1997 N 268/p)

23. Regulation on the procedure for conducting inspections of pharmaceutical organizations of DLO and MT under the Ministry of Health of the Kyrgyz Republic (PPKR No. 298 of June 10, 2011).

24. Resolution of the Government of the Kyrgyz Republic No. 2 of January 5, 2011 "On approval of the procedure for writing prescriptions for medicines and on their release in the Kyrgyz Republic".

25. Resolution of the Government of the Kyrgyz Republic No. 232 of April 22, 2015 "On Approval of the Procedure for Prescribing medicines and on their release in the Kyrgyz Republic" (amendments).

26. Resolution of the Government of the Kyrgyz Republic No. 242 of May 22, 2018, 2015 "On Amendments to the Resolution of the Government of the Kyrgyz Republic" On Approval of the Procedure for Prescribing Medicines and on their Release in the Kyrgyz Republic " (amendments).

27. PPKR No. 167 of April 19, 2011 "On the standards for the consumption of ethyl alcohol for health, education and social security organizations and on the procedure for its circulation in medical and preventive organizations and pharmacy institutions".

28. Resolution of the Government of the Kyrgyz Republic No. 54 of February 18, 2011 "On the procedure for accounting, storage and use of narcotic drugs, psychotropic substances and precursors in the Kyrgyz Republic".

29. Resolution of the Government of the Kyrgyz Republic No. 22 of January 20, 2011 "On the norms of natural loss of medicines and medical devices in pharmacies, organizations of wholesale trade in medicines and health care organizations of the Kyrgyz Republic".

30. The technical regulation "On safe storage of medicines in the pharmaceutical organizations and the organizations of health care and sanitary mode pharmaceutical organizations" (PPKR from 25.09. 2012 No. 646).

31. Technical regulation "On safety of medicines manufactured in pharmacies" (PPKR from may 26, 2012 No. 320).

32. Ppkr No. 28 of the year 12.01.2012 "regulations on preferential drug provision of the population on an outpatient basis according to the Program of state guarantees and Additional program of compulsory medical insurance".

33. PPKR of 20.11.2015 N 790 "Program of state guarantees for providing citizens of the Kyrgyz Republic with health care".

34. PPKR of 07.09.2018 N 420 "On amendments to some decisions of the Government of the Kyrgyz Republic in the field of health and medical insurance" in the Program of State guarantees

35. Handbook of medicines subject to reimbursement under the Supplementary MHI Program and the State Guarantees Program at the outpatient level (Bishkek-2017).

Electronic resource

Website of the KSMA named after I. K. Akhunbayev https://www.kgma.kg/index.php/ru/

Kyrgyz Virtual Scientific Library www.kyrgyzstanvsl.org

Electronic resource "Electronic Library" of KSMA (library.kgma.kg)

Electronic resources of the eIFL project. http://bik.org.kg/ru/eifl_resources/

Appendix 1

Example of certification testing material

Kyrgyz State Medical Academy named after I. K. Akhunbayev

Faculty of «Pharmacy»

STATE CERTIFICATION

of the History of Kyrgyzstan 2nd year students

Select only one correct answer

1. Тарых–бул … изилдеген илим:		***1. History is a science that studies …***	
А	адамзаттын келечегин / humanity's future	**В**	атмосферанын курамын / atmospheric composition
Б	жаратылыш байлыктарын / natural resources	**Г**	адамзаттын басып өткөн жолун / humanity's past
2. Муундардын келип чыгышын жана адамдардын туугандык байланыштарын, уруусун, аты-жөнүн изилдөөчү илим … деп аталат:		***2. The science that studies the origin and kinship relations of people, genera, surnames, generations is called***	
А	genealogy	**В**	heraldry
Б	numismatics	**Г**	ethnography
3. Тигил же бул мезгилде элдер кандай жашап, эмне окуялар болгону тууралуу “издери” изилдөөнү.. деп атайбз.		***3. Studying the "traces" of the past, of that, how people lived, what events took place at one time or another, we call:***	
А	тарыхый булактар / historical sources	**В**	жазуу булактар / written sources
Б	оозеки булактар/ oral sources	**Г**	санжыра булактары / relational sources
4. Табылган сөөк калдыктарынан адамдын келип чыгышын изилдөөчү илим ... деп аталат		***4. Science that studies human origins from bone remains …***	
А	anthropology	**В**	Geology
Б	archaeology	**Г**	Heraldry

5. Христостун төрөлүшүнө чейинки убакыт … мезгил деп аталат		*5. The time before the birth of Christ is called the period …*	
А	биздин доорго чейинки / before our era	**В**	биздин доордун келечегинин / the future of our era
Б	биздин доор / our era	**Г**	биздин доордон кийинки / after our era

STATE CERTIFICATION

5th year students

Discipline «Technology of medicines»

1. Choose the most complete and correct definition. A regulatory document is:

A. A document that establishes standards, rules, norms, instructions, technical specifications(TU), technological regulations(TR), characteristics related to various types of activities in the field of drug circulation

B. A collection of mandatory national standards and regulations that normalize the quality of drugs

B. A document establishing the quality requirements for medicinal products or medicinal plant raw materials and having the character of a state standard

. Collections of orders, regulations, instructions, CMC, FS, VFS, TR, TU, regulating the conditions and rules for the manufacture of medicinal products

2. For the industrial production of medicines is characterized by:

A. Mass demand of the drug

B. Instability of the starting materials and limited shelf life of the finished product

B. Production according to individual prescriptions

D. Release in small (limited quantities)

3. Conditions for the industrial manufacture of medicines:

A. Limited demand for medicines

B. Production taking into account the individual characteristics of the patient

B. The standard of raw materials and finished medicines

D. Manufactured drugs do not ensure the profitability of the pharmaceutical enterprise

4. Maceration:

A. This is the infusion of the required amount of vegetable raw materials with an extractant at room temperature

B. The process of continuous transmission of the extractant flow through a layer of plant material

C. The process of multi-stage promotion of the extractant from more depleted raw materials to less depleted

D. Infusing plant raw materials with water when heated

5. Percolation:

A. This is the infusion of the required amount of vegetable raw materials with an extractant at room temperature

B. The process of continuously passing the extractant stream through a layer of plant material

C. The process of multi-stage promotion of the extractant from more depleted raw materials to less depleted

6. Select the name of the general pharmacopoeia articles:

A. "Acetylsalicylic acid"

B. "Injectable dosage forms"

C. "Glucose solution 40% for injection"

D. All right

7. Select the name of the private pharmacopoeia articles:

A. " Acetylsalicylic acid”

B. "Injectable dosage forms"

C. "Determination of alcohol in pharmaceutical preparations"

D. " Tablets”

Discipline " Management and economics of pharmacy»

1. Choose the most complete and correct answer. State regulation of relations arising in the field of drug circulation is carried out by:

A. State drug registration and licensing of activities in the sphere of circulation of medicines, the qualification and certification of specialists of state control of production, manufacturing, quality, efficiency and safety.
B. Obtaining a license for pharmaceutical activities of legal and natural persons approved by the authorized state body right.
C. Registration and evaluation of the quality of drugs and medical devices approved by the authorized state body right.
D. the creation of the necessary legal and regulatory framework for pharmaceutical activities of natural and legal persons.

2. Choose the most complete and correct answer. State registration of medicinal products:

A. the System of admission of drugs for medical use on the basis of expert evaluation of the registration dossier and evaluation of the results of testing the samples submitted for compliance with the requirements of the quality, effectiveness and safety for humans.
B. System evaluation of drugs through preclinical, clinical, chemical testing.
C. resolution System tolerance of drugs for medical use through experimental evaluation for compliance with the requirements of ND.
D. System tolerance to drugs wholesale and retail sales on the basis of evidence-based medicine.

3. Choose the most complete and correct answer.
The Law of the Kyrgyz Republic
" On the circulation of Medicines " regulates:
A. the Relations connected with the implementation, disposal, is in the sphere of circulation of medicines.
B. Relations arising in connection with the development, preclinical and clinical studies of medicines, manufacturing, fabrication, assessment of their quality, efficiency, safety, the implementation of medicines and other actions in the sphere of circulation of medicines
C. Relationships that arise between consumers and providers of medical and pharmaceutical services.
D. If all true.

4. The nomenclature of pharmacy institutions includes:
A. Pharmacies; pharmacy points, shops, pharmacy warehouses, pharmacies of medical and preventive institutions;
B. Pharmacy warehouses, medical institutions, state medical institutions;
C. Pharmacies of medical and preventive institutions. LPU, CSM;
D. Pharmacies,FOMS, DLO.

5. License requirements and conditions are:
A. The set of requirements and conditions established by the provisions on licensing of specific types of activities, the fulfillment of which is mandatory for the licensee in the implementation of the licensed type of activity;
B. Placement of the premises in which the licensed activity will be carried out;
C. Compliance of the conditions and place of activity with the established requirements for the provision of medical care and services;
D. Requirements and conditions that comply with the norms and rules in the field of circulation of medicines and medical devices established by the Ministry of Health of the Kyrgyz Republic

Discipline «Pharmaceutical chemistry»

1) In the quantitative determination of sodium bicarbonate
$NaHCO3 + HCl \rightarrow NaCl + H2O + CO2\uparrow$
use the indicator

A) Methyl orange
B) starch
C) iron (III) ammonium sulfate (iron-ammonium alum)

D) potassium chromate

2) By titration with 0.1 M sodium thiosulfate solution, a quantitative determination is carried out
A) sodium chloride

B) alcohol iodine solution 5%
C) sodium tetraborate
D) dilute hydrochloric acid

3) In the quantitative determination of silver nitrate by thiocyanatometry (rhodanometry) $AgNO_3 + NH_4NCS \rightarrow AgNCS\downarrow + NH_4NO_3$ use the indicator

A) iron (III) ammonium sulfate (iron-ammonium alum)
B) Methyl orange
C) Phenolphthalein
D) acid chrome black special

4) By the method of Mor argentometry, a quantitative determination can be carried out

A) potassium iodide
B) calcium chloride
C) magnesium sulfate
D) Zinc sulfate

5) In the quantitative determination of medicinal substances by direct bromatometry, the indicator is used as

A) Crystal violet
B) Phenolphthalein
C) Methyl red
D) ferroin [complex of o-phenanthroline sulfate with iron (II)]

6) In the quantitative determination of medicinal substances by reverse bromatometry, the indicator is used as

A) Crystal violet
B) Phenolphthalein
C) Methyl red
D) starch

Discipline «Pharmacognosy»

1. As a medicinal raw material, dried marshmallow is harvested
A) grass
B) fruits
C) roots
D) flowers

2. As a medicinal raw material, common mountain ash is harvested
A) fruits
B) flowers
C) roots
D) grass
3. Cardiac glycosides are the main group of biologically active substances in the
A) the grass of the spreading jaundice
B) large celandine grass
C) licorice roots
D) Peppermint leaves
4. Saponins are the main group of biologically active substances in
A) licorice roots
B) the grass of the spreading jaundice
C) large celandine grass
D) Peppermint leaves
5. For the leaves of foxglove purple, the leading group of biologically active substances are
A) cardiac glycosides
B) Anthraglycosides
C) alkaloids
D) essential oil

Appendix 2

Examination card of
the state interdisciplinary comprehensive exam
for 5th year students of the «Pharmacy» Faculty
2017-2018 academic year

Card № 1

Take: Riboflavin 0.005

Ascorbic acid 0.1

Sugar 0.3

Mix , let the powder be made

Give such doses of the number 10

Label: 1 powder 3 times a day

Pharmaceutical chemistry:

The theoretical part.

- Write the chemical formula of ascorbic acid, its Latin and rational names;

- describe the physical and chemical properties of ascorbic acid (appearance, solubility, etc.) and use them to evaluate the quality;

- give the methods of qualitative and quantitative analysis of ascorbic acid;

- storage conditions;

- medical application and release form.

The practical part.

Perform the authentication reaction on ascorbic acid. Write the reaction equation.

1) To 1 ml of the drug solution, add 3-5 drops of 0.1 mol / l of the solution .... Discoloration of the latter occurs.

2) To 1 ml of the drug solution, add 0.5 ml of the solution ..., a dark precipitate falls out.

Drug technology.

Theoretical part.

The main technological stages of powder manufacturing. What is "grinding" and "degree of grinding"? What equipment is used for grinding in pharmacy and factory settings?

The practical part.

1. Make calculations and draw up a passport of written control.

2. Describe the manufacturing technology of this recipe?

3. Weigh the calculated amount of ascorbic acid and sugar, mix, divide into doses and issue for release.

Pharmacognosy:

The theoretical part.

- Describe the definition of " vitamins»;

- give the Russian, Latin and Kyrgyz names of the families that produce plants and the types of raw materials used to produce ascorbic acid;

- describe the producing plant;

- specify the conditions for collecting, drying and storage of this type of medicinal plant raw materials;

- specify the chemical composition of medicinal plant raw materials;

- what is the main method of obtaining vitamin C from medicinal plant raw materials?;

- specify the pharmacotherapeutic group of medicines;

- list the herbal remedies.

The practical part.

Choose from the suggested herbarium samples and raw materials the plant that is the source of ascorbic acid production;

- perform a macroscopic analysis of the crushed raw materials "Rosehip fruits" in accordance with the requirements of Article No. 38 of the GF XI;

- prepare a micro-preparation of rosehip fruits, describe the main diagnostic signs.

Pharmacy Management and Economics:

The theoretical part.

What document entitles a pharmacy to manufacture medicines and which authorized state body issues it? List the nomenclature of pharmacy organizations and determine the type of pharmacy for this activity? Sources of raw materials and the procedure for obtaining them.

The practical part.

1. What documents are issued when the pharmacy receives these substances, give a description of these documents.

2. Calculate the retail price of this dosage form.

Approved at the meeting

EMPC in the speciality "Pharmacy»

Protocol No. 19 of February 22, 2018

KYRGYZ STATE MEDICAL ACADEMY NAMED AFTER

I. K. AKHUNBAYEV

Examination card of the state interdisciplinary comprehensive exam

for 5th year students of the « Pharmacy» Faculty

2017-2018 academic year

Card №2

Take: Platyphylline hydrothartrate 0.005

Papaverine hydrochloride 0.04

Aminophylline 0.2

Mix to make a powder

Give such doses of the number 12

Label: 1 powder 3 times a day

Pharmaceutical chemistry:

<u>The theoretical part.</u>

- give the chemical formula of platyphylline hydrothartrate, its Latin and rational names;

- describe the physical and chemical properties of platyphylline hydrothartrate (appearance, solubility, etc.) and its use for quality assessment;

- give the methods of qualitative and quantitative analysis of platyphylline hydrothartrate;

- storage conditions;

- medical application and release form.

The practical part.

Conduct a blood reaction to platyphylline hydrothartrate. Write the reaction equation.

Hydrothartrate. To 1 ml of the solution is added ..... and 0.5 ml of ethanol, a white crystalline precipitate is released, soluble in diluted mineral acids and solutions of caustic alkalis.

Drug technology

<u>Theoretical part.</u>

How is this dosage form prescribed? Describe the order of mixing the ingredients. Define triturations, the technology of their preparation, the rules of storage. Do I need to use trituration in this recipe?

The practical part.

1. Make calculations and draw up a passport of written control.

2. Weigh the calculated amount of platyphylline hydrothartrate, describe the manufacturing technology of this prescription and issue it for vacation.

Pharmacognosy:

The theoretical part.

- Describe the definition of " alkaloids»;

- give the Russian, Latin and Kyrgyz names of the families that produce plants and raw materials used to produce platyphylline hydrotartrate;

- describe the producing plant;

- specify the conditions for collecting, drying and storage of this type of medicinal plant raw materials;

- specify the chemical composition of medicinal plant raw materials;

- what are the main qualitative reactions to alkaloids?;

- specify the pharmacotherapeutic group of medicines;

- list the herbal remedies.

The practical part.

- Choose from the suggested herbarium samples and raw materials the plant that is the source of papaverine hydrochloride production;

- perform a macroscopic analysis of the crushed raw materials "Rhizome and grass of the flat-leaved crossbill" in accordance with the requirements of the ND;

- prepare a micro-preparation of rhizomes and herbs of the flat-leaved krestovnik, describe the main diagnostic signs.

Pharmacy Management and Economics:

The theoretical part.

Do I need a quality certificate for the implementation of this dosage form? Describe the procedure for the certification of medicines. How is the quality of this dosage form evaluated in the pharmacy?

The practical part.

The pharmacy purchased 10 kg of papaverine hydrochloride during the reporting period. During the monthly inventory, it was revealed that the book balance of papaverine hydrochloride at the end of the month was 3.4 kg, the actual balance was 3.3 kg. According to the outpatient prescription, 2.7 kg was consumed. What calculations need to be made to complete the inventory. What documents need to be issued.

Approved at the meeting

EMPC in the specialty "Pharmacy»

Protocol No. 19 of February 22, 2018

KYRGYZ STATE MEDICAL ACADEMY NAMED AFTER

I. K. AKHUNBAYEV

Examination card of the state interdisciplinary comprehensive exam

for 5th year students of the « Pharmacy» Faculty

2017-2018 academic year

Card №3

Take: Sodium Bromide 3.0

Tincture of Valerian

Tincture of motherwort equally in 10 ml

Mix. Give. Label : 10-20 drops for pain.

Pharmaceutical chemistry:

Theoretical part

- give the chemical formula of sodium bromide, its Latin name;

- describe the physical and chemical properties of sodium bromide (appearance, solubility, etc.) and its use for quality assessment;

- give the methods of qualitative and quantitative determination of sodium bromide;

- storage conditions;

- medical application and release form.

The practical part.

Perform the authentication reaction on the sodium bromide. Write the reaction equation.

The bromide ion. To 0.5 ml of the drug, add 3 drops of diluted nitric acid, 3-5 drops of solution ..., a yellowish curd precipitate is formed, insoluble in diluted nitric acid and difficult to dissolve in solution ....

Drug technology

Theoretical part.

Tinctures. General characteristics. Methods for obtaining tinctures. Extractants used to make tinctures. Give the technological scheme for obtaining tinctures in the factory.

The practical part.

1. Make calculations and draw up a passport of written control.

2. Make this prescription and issue it for vacation.

Pharmacognosy:

The theoretical part.

- Describe the definition of " flavonoids»;

- give the Russian, Latin and Kyrgyz names of the families that produce plants and the raw materials used to produce quercetin;

- describe the producing plant;

- specify the conditions for collecting, drying and storage of this type of medicinal plant raw materials;

- specify the chemical composition of medicinal plant raw materials;

- what are the main qualitative reactions to quercetin;

- specify the pharmacotherapeutic group of medicines;

- list the herbal remedies.

The practical part.

- Choose from the suggested herbarium samples and raw materials the plant that is the source of quercetin production;

- perform a macroscopic analysis of the crushed raw material "Motherwort Grass" in accordance with the requirements of Article No. 54 of the GF XI;

- prepare a micro-preparation of motherwort grass, describe the main diagnostic signs.

Pharmacy Management and Economics:

The theoretical part. On what prescription form should the doctor write out this prescription? List the forms of prescription forms and give them a description. For the manufacture of this recipe, ethyl alcohol is used. The procedure for purchasing ethyl alcohol by a pharmaceutical organization, accounting, storage.

The practical part.

Fill in the appropriate accounting log of ethyl alcohol at the end of the month, if at the beginning of the month its balance was 10 kg, the organization purchased 20 kg during the month, 15.3 kg was used for the production of dosage forms according to the extemporal formulation.

Calculate the retail price of this dosage form.

Appendix 3

Maintenance of the assessment fund

№ of testing	**Content**		**Number of sets of n/a (tasks)**
1. History of Kyrgyzstan	Test tasks with standards of answers in the attached electronic holder in the form of a link to the program and in the printed version		250 (electronic version)
2. Final interdisciplinary comprehensive exam in the speciality	2.1. Computer testing	Test tasks with standards of answers in the attached electronic holder in the form of a link to the program and in the printed version	2000 (electronic and printed version)
	2.2. Practical stage	Situational tasks in the attached electronic media in the form of a link to the program and in the printed version	108 (electronic and printed version)
	2.3 Oral questioning of cards	Questions on the Management and economics of pharmacy, drug technology, pharmacognosy and pharmaceutical chemistry for the oral comprehensive exam in the speciality	187 (electronic and printed version)