

**FEDERAL STATE BUDGET EDUCATIONAL  
HIGHER EDUCATION INSTITUTION  
"ROSTOV STATE MEDICAL UNIVERSITY"  
MINISTRY OF HEALTH OF THE RUSSIAN FEDERATION**

**FACULTY OF TREATMENT AND PREVENTION**

Appraisal Fund  
in the discipline "Pharmacology"

Specialty 05/31/01 General Medicine

### 1. Interim certification form.

- Exam

### 2. Type of intermediate certification.

- Interview
- Test control
- Passing practical skills - writing recipes.

### 3. List of competencies formed by the discipline or in formation which discipline is involved

#### 4. general professional (OPK)

Code	Name	Indicator(s)	achievements	general professional competencies
GPC-8	Readiness for medical use of drugs and other substances and their combinations in solving professional problems.	Able to prescribe treatment and monitor its effectiveness and safety.		

### 5. Stages of developing competencies in the process of mastering the discipline

Sections of the discipline	Codes generated competencies
Semester 5	
Section 1. Introduction to pharmacology. General recipe. General pharmacology.	+
Section 2. Chemotherapeutic agents.	+
Section 3. Neurotropic agents.	+
Section 4. Medicines affecting inflammation, allergies and immunity.	+
Section 5. Means with a predominant effect on tissue metabolic processes.	+
Section 6. Medicines affecting the cardiovascular system.	+
Semester 6	
Section 5. Means with a predominant effect on tissue metabolic processes.	+
Section 6. Drugs affecting the cardiovascular system.	+
Section 7. Means affecting the functions of executive bodies.	+
Section 8. Drugs affecting the central nervous system.	+

### 6. Types of assessment materials in accordance with the generated competencies

Name of the competency achievement indicator (ID)	Types of assessment materials	
	Current certification	Interim certification
OPK - 8	<ul style="list-style-type: none"> <li>• Tests</li> <li>• Practical skills (writing prescriptions)</li> </ul>	<ul style="list-style-type: none"> <li>• Tests</li> <li>• Practical skills (writing prescriptions)</li> </ul>

	• Questions for control	• Summary questions for interviews
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## 7. Current control

Types and forms of control from the RPD of discipline	Number of example (standard) tasks for 1 competence
Tests	10 questions
Practical skills (prescription writing)	5 skills
Oral survey, interview	test questions on the topics of the section

### OPK - 8

### Tests

#### 1. Side effects of beta blockers:

1. Tachycardia
2. Increased blood pressure
3. Heart failure
4. Mental excitement
5. Ulcerative lesions of the gastric mucosa

#### 2. Semisynthetic opioid - phenanthrene agonist:

1. Lemoran
2. Promedol
3. Ethylmorphine
4. Fentanyl
5. Dexamoramide

#### 3. The mechanism of antipsychotic action of neuroleptics is mainly due to:

1. Stimulation of dopamine receptors in the central nervous system
2. Blockade of dopamine receptors in the central nervous system
3. Stimulation of serotonin receptors in the central nervous system
4. Stimulation of noradrenergic receptors in the central nervous system
5. Blockade of noradrenergic receptors in the central nervous system

#### 4. What mechanism of anxiolytic action is most likely for diazepam?

1. Blockade of monoamine oxidase
2. Stimulation of benzodiazepine receptors
3. Direct GABA-mimetic action
4. Blockade of dopamine receptors in the central nervous system
5. Inhibition of monoamine reuptake in the central nervous system

#### 5. Indications for the use of glucocorticoids:

1. Arterial hypertension
2. Collagenoses
3. Osteoporosis
4. Immune suppression
5. Long-term non-healing ulcer

#### 6. The leading mechanism of the anti-inflammatory action of NSAIDs is:

1. Blockade of phospholipase A and disruption of the cascade of arachidonic acid transformations
2. Blockade of adenylate cyclase and reduction of cAMP formation
3. Blockade of cyclooxygenase and disruption of the formation of cyclic endoperoxides
4. Antagonism with inflammatory mediators (histamine, serotonin and bradykinin) and cytokines
5. Limiting the bioenergetics of inflammation

#### 7. What is the main mechanism of action of cardiac glycosides associated with:

1. With phosphodiesterase stimulation
2. With Ca blockade<sub>2+</sub>-ATPase
3. With stimulation of adenylate cyclase
4. With Na blockade<sub>+</sub>,K<sub>+</sub>-ATPase
5. With blockade of phospholipase A<sub>2</sub>

#### 8. Which beta blocker is cardioselective?

1. Propranolol
2. Alprenolol
3. Pindolol
4. Nadolol
5. Atenolol

#### 9. Specify a broad-spectrum penicillin preparation:

1. Benzylpenicillin Na salt
2. Phenoxyethylpenicillin
3. Benzylpenicillin novocaine salt
4. Ampicillin
5. Bicillin V

#### 10. Which aminoglycoside has antituberculosis activity?

1. Amikacin
2. Monomycin
3. Dibekacin
4. Sizomycin
5. Netilmicin

**Sample answers .**

- The correct answer is underlined

**Practical skills (prescription writing)**

**Task 1.** A preparation for conduction anesthesia. **Standard answer.**

- Xicaine (Lidocaine) - ampoules
- Rp.: Sol. Xycaini 2% - 2 ml  
Dtd N° 10 in ampull.  
S. For conduction anesthesia.

**Task 2.** A drug used to lower intraocular pressure. **Standard answer.**

- Aceclidine – eye drops
- Rp.: Sol. Aceclidini 3% - 10 ml  
DS Eye drops. 1-2 drops into the conjunctival sac of the affected eye

**Task 3.** A drug that reduces the secretion of the salivary glands, bronchial glands, Gastrointestinal glands.

**Response standard.**

- Atropine sulfate – ampoules
- Rp.: Sol. Atropini sulfatis 0.1% - 1 ml  
Dtd N° 6 in ampull.  
S. 1 ml subcutaneously.

**Task 4.** Analgesic used for myocardial infarction **Standard answer.**

- Morphine hydrochloride – ampoules
- Rp.: Sol. Morphini hydrochloride 1%-1ml  
Dtd N° 10 in ampull.  
S. 1 ml. subcutaneously

**Task 5.** A narcotic analgesic that weakly depresses the respiratory center. **Standard answer.**

- Promedol – ampoules
- Rp.: Rp.: Sol. Promedoli 1%-1ml  
Dtd N° 10 in ampull.  
S. 1 ml. subcutaneously

**1. Write out:** *Paracetamol - tablets*

**Response standard.**

- Rp.: Paracetamol 0.5  
Dtd N° 10 in tab.  
S. 1 table each. for headaches.

**2. Write out:** Adrenaline hydrochloride – ampoules

**Standard answer.**

Rp.: Sol. Adrenalini hydrochloridi 0.1% -1 ml  
Dtd N" 6 in ampull.  
S. 0.5 ml subcutaneously.

**3. Write out:** Nacom - tablets\_

**Standard answer.**

Rp.: Tab. "Nacom" No. 100 S. 2  
tables each. 2 times a day

**4. Write out:** Benzylpenicillin sodium – vials\_

**Standard answer.**

Rp.: Benzylpenicillinum-natrii 250,000 units  
Dtd N" 12  
S. Dilute the contents of the bottle into 2 ml. 0.5% novocaine solution, intramuscularly 4-6 times a day.

**5. Write out:** Nitroglycerin – tablets\_

**Standard answer.**

Rp.: Nitroglycerini 0.0005  
Dtd N" 40 in tab.  
S. 1 table each. under the tongue during an attack of angina.

**Interview, oral questioning**

1. Biotransformation medicinal substances: main sites of transformation medicinal substances, biotransformation phases, biotransformation reactions. Microsomal and non-microsomal biotransformation. Enzymes involved in these processes. Phenomena of induction and inhibition of microsomal liver enzymes.
2. The concept of pharmacodynamics of medicinal substances. Types of action of drugs substances in the body. Concepts about local, resorptive, main, side, reversible and irreversible effects of medicinal substances.
3. Classification drugs acting on cholinergic innervation. M-, N-cholinomimetics. Substances. Mechanism of action, pharmacological effects.
4. Classification of medicinal substances acting on the transmission of excitation in adrenergic synapse.
5. Neuroleptics of the phenothiazine series. Classification. Possible mechanisms of action. Characteristics of groups. Pharmacological effects of aminazine, triflazine, etaparazine, fluorophenazine. Side effects of representatives of the phenothiazine series.
6. Vitamin preparations. Vitamins. General biological properties of vitamins. Kinds vitamin therapy. Ascorbic acid. Chemical structure. Daily requirement. Pharmacodynamics and pharmacokinetics. Indications and contraindications for use. Vitamin P, preparations. Indications for use.
7. Non-steroidal anti-inflammatory drugs. Classification by chemical structure and duration of action. The mechanism of analgesic, antipyretic and anti-inflammatory effects. Para-aminophenol derivatives. Characteristics of the main pharmacological effects. Clinical use, contraindications. Side effects.
8. Hypertensive substances. Classification. The mechanism of action of representatives of different groups. Indications for use.
9. Chemotherapy concept. Basic principles of chemotherapy. Main groups antibacterial agents. Antibiotics. Their classification according to the mechanism of action, the spectrum of antibacterial activity, clinical use, and chemical nature.

10. Antiviral drugs. Classification by influence on the stages of reproduction virus. Interferons: drugs, mechanism of action, clinical use. The concept of interferonogens.

## 8. Interim certification

Types of intermediate certification from the RPD disciplines	number of example (standard) tasks for 1 competency
Tests	10 questions
Practical skills (prescription writing)	10 skills
Interview	All control questions for the discipline (or semester)

### OPK - 8

#### Tests

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Collagenoses  
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 Long-lasting ulcer

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Limiting the bioenergetics of inflammation

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Monomycin  
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Sample answers .

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S. 1 ml. subcutaneously

6. Write out: *Paracetamol - tablets*

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8. **Write out:**Nacom - tablets\_

**Standard answer.**

Rp.: Tab. "Nakom" No. 100 S. 2  
tables each. 2 times a day

9. **Write out:**Benzylpenicillin sodium – vials\_

**Standard answer.**

Rp.: Benzylpenicillinum-natrii 250,000 units  
Dtd N" 12  
S. Dilute the contents of the bottle into 2 ml. 0.5% novocaine solution, intramuscularly 4-6 times a day.

10. **Write out:**Nitroglycerin – tablets\_

**Standard answer.**

Rp.: Nitroglycerini 0.0005  
Dtd N" 40 in tab.  
S. 1 table each. under the tongue during an attack of angina.

### **Interview, oral questioning**

#### **GENERAL PHARMACOLOGY**

1. Subject and tasks of pharmacology. Its place among other medical and biological disciplines.
2. The main historical stages in the development of domestic pharmacology. Works by I.P. Pavlov, N.P. Kravkova, M.N. Nikolaeva, N.V. Vershinina, A.I. Cherkesa, I.S. Tsitovich, S.V. Anichkov, V.V. Zakusova.
3. Definition of the concepts of medicinal product (medicine), medicinal substance, medicinal product, dosage form, medicinal raw materials. What is a prodrug?
4. Methods used in pharmacology to study the physicochemical characteristics and pharmacological properties of medicinal substances.
5. What is the pharmacokinetics of drugs? pharmacokinetic parameters (half-life, basic volume of distribution, clearance). 6. What physicochemical factors determine the penetration of drugs through biological membranes? Passive and active transport, filtration. Accelerated or exchange diffusion.
7. Characteristics of the routes of administration and entry of medicinal substances into the body. Examples of differences in drug absorption. Bioavailability of drugs. Its dependence on the pH of the environment and pK of the drug
8. Distribution of drugs in biological fluids and tissues of the body, their redistribution. Reasons regulating plasma concentrations of drugs. Concept of  $T_{1/2}$  and the value of this pharmacokinetic parameter for the pharmacodynamic characteristics of the substance.
9. Factors that change the effect of medicinal substances. Dose of a medicinal substance, types of doses. Peculiarities of dosing of medicinal substances in children.



10. Elimination of drugs. Concept of  $T_{1/2}$  and the significance of this value for the pharmacokinetic characteristics of the drug. The kidneys are the main eliminating organ. Renal clearance of drugs, its relationship with creatinine clearance. 11. Biotransformation of medicinal substances: main sites of transformation of medicinal substances, phases of biotransformation, biotransformation reactions. Microsomal and non-microsomal biotransformation. Enzymes involved in these processes. Phenomena of induction and inhibition of microsomal liver enzymes. 12. Features of the metabolism of drugs in newborns and infants. Excretion of drugs, routes of drug elimination. 13. The concept of pharmacodynamics of medicinal substances. Types of action of medicinal substances in the body. Concepts about local, resorptive, main, side, reversible and irreversible effects of medicinal substances.

14. Undesirable effects of drugs in children. Negative effects of drugs on the embryo and fetus. The concept of embryotoxicity, teratogenicity and fetotoxicity. Medicines that cause these phenomena.

15. Dependence of the pharmacotherapeutic effect on the properties of drugs and the conditions of their use: dependence on chemical structures, physico-chemical properties.

16. Phenomena observed with repeated use of drugs: accumulation, addiction, tachyphylaxis, sensitization.

17. Combined action of medicinal substances: synergism and its types (summed, potentiated, physiological), examples. Antagonism and its types: physical-chemical, chemical, competitive, physiological, one- and two-sided; examples. The concept of synergy-antagonism, examples.

18. The importance of the individual characteristics of the body and its condition for the manifestation of the effect of drugs (age, gender, genetic factor, circadian rhythms). 19. Types of drug therapy: etiotropic, pathogenetic, symptomatic, preventive, replacement.

20. Interaction of medicinal substances in the body, classification. The concept of pharmacological and pharmaceutical interactions. Examples.

21. General principles of treatment of acute drug poisoning.

### **CHEMOTHERAPEUTIC DRUGS**

22. Antiseptics and disinfectants (non-selective antimicrobial agents). Classification. Basic mechanisms of action of drugs by group. Their application.

23. The concept of chemotherapy. Basic principles of chemotherapy. Main groups of antibacterial agents. Antibiotics. Their classification according to the mechanism of action, the spectrum of antibacterial activity, clinical use, and chemical nature.

24. Beta-lactam antibiotics. Antibiotics of the penicillin series. Classification. Preparations of biosynthetic penicillins. Mechanism of action. Range of antimicrobial activity and their main pharmacokinetic features by group. Application. Side effects.

25. Beta-lactam antibiotics, semisynthetic penicillins. Classification, mechanism of action. Spectrum of antimicrobial activity. Indications for use. Side and toxic effects of penicillins.

26. Beta-lactam antibiotics. Cephalosporins. Classification. Mechanism of action. Spectrum of antimicrobial activity by generation. Application. Side effects.

27. Beta-lactam antibiotics: carbapenems and monobactams. Drugs, mechanism of action, spectrum of activity. Application. Side effects. Thienam (cilastatin). 28. Combined penicillins. Principles of combination. Features of the action. Application. Possible side effects.

29. Macrolides. Classification. Mechanism of action. Spectrum of antimicrobial activity by group. Features of azalides (new macrolides). Application. Side effects.

30. Preparations of biosynthetic and semi-synthetic tetracyclines. Mechanism of action and spectrum of antimicrobial activity. Features of pharmacokinetics. Application. Side effects.

31. Glycopeptides. Drugs. Mechanism of action. Application. Side effects.

32. Levomycetin. Mechanism of action and pharmacokinetic features. Spectrum of antimicrobial activity. Application. Side effects.

33. Antibiotics of the lincosamide group. Mechanism of action. Activity spectrum (give differences in the group). Application. Side effects.

34. Antibiotics of the aminoglycoside group. Classification by generation. Mechanism of action. Spectrum of antimicrobial activity. Pharmacokinetics. Features of application. Side effects.

35. Polymyxins. Drugs. Mechanism of action. Spectrum of antimicrobial activity. Pharmacokinetics. Indications for use. Side effects.

36. Sulfonamide drugs. Classification. Mechanism of action. Spectrum of antimicrobial activity. Features of the pharmacokinetics of resorptive drugs. Application. Adverse reactions of sulfonamides.

37. Combined preparations of sulfonamides with trimethoprim and aminosalicylic acid. Features of the mechanism of action. Spectrum of antimicrobial activity. Indications for use. Side effects.

38. Quinolone carboxylic acid derivatives: nalidixic acid group, pefloxacin and fluoroquinolones. Mechanisms of action, spectrum of activity, pharmacokinetic features. Side effects.

39. Nitrofurantoin derivatives. Mechanism of action. Spectrum of antimicrobial activity. Features of pharmacokinetics. Possible side effects.

40. Synthetic antibacterial agents from the group of 8-hydroxyquinolines and quinoxaline. Spectrum of activity. Clinical application. Side effects.

41. Antibacterial drugs – imidazole derivatives. Features of the mechanism of action. Spectrum of activity. Clinical application. Side effects.

42. Substances with antisyphilitic action. Groups of drugs. Advantages and disadvantages of drugs in each group. Side effects.

43. Anti-tuberculosis drugs. Classification by groups. Characteristics of the first group (isoniazid and rifampicin). Mechanism of tuberculostatic action. Features of tuberculosis therapy. Side effects.

44. Antituberculosis drugs of groups II and III. Drugs. tuberculostatic action. Mechanism. Indications for use. Side effects. 45. Antiviral drugs. Classification according to the effect on the stages of virus reproduction. Interferons: drugs, mechanism of action, clinical use. The concept of interferonogens.

46. Antiviral agents that disrupt the synthesis of early viral proteins and nucleosides. Features of the mechanism of action ensuring selectivity, clinical application. Side effects.

47. Drugs for the treatment of HIV infection: mechanism of action, application, possible side effects.

48. Antimalarials. Classification according to the direction of action at different stages of development and forms of plasmodium. Drugs. Application.

49. Principles of the use of antimalarial drugs: therapeutic and prophylactic. Personal and public chemoprophylaxis of malaria. Drugs. Their effectiveness (individual).

50. Drugs used in the treatment of amoebiasis. Classification according to the direction of action on amoebiasis of various localizations. Characteristics of drugs.

51. Drugs used in the treatment of giardiasis, trichomoniasis, toxoplasmosis, leishmaniasis.
52. Means for the treatment of mycoses. Classification by chemical nature and clinical use. Mechanism of action of polyene antibiotics. Drugs. Features of pharmacokinetics. Side effects.
53. Means for resorptive and local treatment of dermatomycosis. Mechanism of action of imidazole derivatives. Drugs. Side effects. Terbinafine. Features of application.
54. Means for the treatment of candidomycosis. Preparations of polyene antibiotics, macrolides, imidazole derivatives. Features of application.
55. Anthelmintic (anthelmintic) agents. Divided into groups according to the mechanism of action. Means used for the treatment of intestinal and extraintestinal helminthiasis. Possible adverse reactions.
56. Alkylating antitumor agents. Classification by chemical structure. Mechanism of action. Range of action. Adverse reactions.
57. Antitumor agents of the group of antimetabolites and antibiotics with antitumor activity. Drugs. Possible mechanisms of action. Range of action. Adverse reactions.

### **NEUROTROPIC DRUGS**

58. Local anesthetic substances. Classification. The mechanism of anesthetic action and its localization. The sequence of turning off different types of sensitivity.
59. Types of local anesthesia. Comparative assessment of modern anesthetics and their use in different types of anesthesia. Toxic effect of anesthetic substances. Measures to prevent it.
60. Medicines that reduce the sensitivity of afferent nerve endings or prevent their excitation (astringents, enveloping and adsorbent agents). Indications for use.
61. Medicines that stimulate the endings of afferent nerves (irritants, reflex breathing stimulants, bitters, laxatives and choleric agents of reflex action). Indications for use.
62. Neurotropic drugs. Definition. General principles of the structure of the efferent nervous system. The concept of chemical transmission of nerve excitation and the organization of chemical synapse. "Targets" for neurotropic drugs.
63. Structure and functioning of the cholinergic synapse. Structure of the cholinergic receptor. Classification and localization of cholinergic receptors. 64. Classification of medicinal substances acting on cholinergic innervation. M-, N-cholinomimetics. Substances. Mechanism of action, pharmacological effects.
65. N-cholinomimetics. Substances. Mechanism of action, indications for use, contraindications.
66. M-cholinomimetics, mechanism of action, pharmacological effects. Clinical application. Muscarine poisoning, relief measures.
67. Anticholinesterase substances. Structure of cholinesterase, its types. Interaction of cholinesterase with acetylcholine. Classification of anticholinesterase substances. Pharmacological effects. Clinical application.
68. Features of the action of anticholinesterase substances of phosphorus-organic structure. Clinical application of FOS. Picture of acute poisoning with anticholinesterase substances and measures of assistance. Cholinesterase reagents.
69. Substances with M-anticholinergic action. Atropine. Chemical structure. Pharmacological effects. Clinical application. Poisoning with atropine and atropine-containing plants in children. Help measures.

70. Compounds of the atropine group. Mechanism of action. Pharmacological effects. Comparative characteristics of drugs from the atropine group.
71. Synthetic anticholinergic substances. Drugs. Pharmacological effects, indications and contraindications for use. Comparative characteristics.
72. Central anticholinergic blockers. Drugs. Pharmacological effects. Special indications and contraindications for use. Comparative characteristics.
73. Substances that block N-cholinoreactive systems. Ganglioblockers. Classification and mechanism of action. Comparative characteristics. Main pharmacological effects. Indications for use. Side effects.
74. Substances that block N-cholinoreactive systems. Muscle relaxants. Classification. Mechanism of action. Pharmacological effects. Clinical application. Possible complications. Antagonists of muscle relaxants.
75. Structure of the adrenergic synapse and adrenergic receptors. Synthesis, deposition, release and reuptake of the mediator. Classification and localization of adrenoceptors.
76. Classification of medicinal substances acting on the transmission of excitation in the adrenergic synapse.
77. Adrenaline and norepinephrine. Chemical structure. Mechanism of action. Pharmacological effects, indications for use, contraindications. Side effects.
78. Sympathomimetics. Chemical structure. Features of the mechanism of action. Pharmacological effects, indications for use, contraindications. Side effects.
79. Alpha adrenergic agonists. Classification. Mechanism of action. Pharmacological effects, indications for use, contraindications. Side effects.
80. Alpha<sub>2</sub>-adrenergic agonists. Mechanism of action. Pharmacological effects, indications for use, contraindications. Side effects.
81. Beta-adrenergic agonists of selective and non-selective action. Classification. Mechanism of action. Pharmacological effects, indications for use, contraindications. Side effects.
82. Alpha adrenergic blockers. Classification. Mechanism of action. Drugs. Pharmacological effects. Indications for use, contraindications. Side effects.
83. Beta-blockers. Classification. Drugs. The mechanism of formation of the main pharmacological effects. Indications for use, contraindications. Side effects.
84. Comparative characteristics of beta blockers (built-in sympathomimetic activity, membrane stabilizing effect, hybrid adrenergic blockers)
85. Adrenergic blockers with a presynaptic mechanism of action (sympatholytics). Localization, features of the mechanism of action and main pharmacological effects of octadine and reserpine. Clinical application.

### **MEDICINES AFFECTING INFLAMMATION, ALLERGY AND IMMUNITY ON PROCESSES**

86. Anti-inflammatory drugs. Definition. Classification. Steroidal anti-inflammatory drugs. Classification, mechanism of action, main pharmacodynamic effects. Indications, contraindications for use, Side effects.
87. Non-steroidal anti-inflammatory drugs. Classification according to chemical structure and duration of action. The mechanism of analgesic, antipyretic and anti-inflammatory effects. Para-aminophenol derivatives. Characteristics of the main pharmacological effects. Clinical use, contraindications. Side effects.

88. Non-steroidal anti-inflammatory drugs - derivatives of salicylic and anthranilic acids. Main pharmacodynamic effects. Indications and contraindications for use. Side effects.
89. Non-steroidal anti-inflammatory drugs - derivatives of pyrazolone and oxicams. Main pharmacodynamic effects. Indications and contraindications for use. Side effects.
90. Non-steroidal anti-inflammatory drugs – derivatives of indoleacetic, phenylacetic and naphthylpropionic acids. Indications and contraindications for use. Side effects.
91. Antiallergic drugs. Definition. Classification. Glucocorticoids, classification. Mechanism of antiallergic action. Main pharmacological effects. Indications and contraindications for use. Side effects.
92. N<sub>1</sub>-Histamine blockers. Classification. Mechanism of action. Comparative characteristics of drugs of the first and second generations. Pharmacological effects. Indications and contraindications for use. Side effects.
93. Antiallergic drugs. Inhibitors of mast cell degranulation. Drugs. Mechanism of action. Indications for use. Pharmacological effects. Indications for use. Side effects.

### **DRUGS WITH A PRIMARY INFLUENCE ON TISSUE METABOLISM PROCESSES**

94. Hormonal drugs. Sources.. Types of hormone therapy. Hypothalamic hormone preparations. Application.
95. Preparations of pituitary hormones. Mechanism of action, pharmacological effects. Indications for use. Side effects.
96. Thyroid hormone preparations. Antithyroid drugs. Calcitonin. Their application.
97. Preparations of pancreatic hormones. Insulin. Impact on exchange. Preparation, purification methods. Insulin preparations. Dosing. Application. Side effects. The concept of insulin tolerance.
98. Synthetic antidiabetic agents. Mechanism of action. Main groups. Drugs. Application. Side effects.
99. Glucocorticoid preparations. Impact on exchange                      Anti-inflammatory, antiallergic and immunosuppressive effects of glucocorticoids. Application. Complications of glucocorticoid therapy, measures to prevent them.
100. Mineralocorticoids. Impact on exchange. Drugs. Application. Mineralocorticoid antagonists.
101. Sex hormone preparations. Preparations of hormones of the female reproductive glands. Estrogenic and antiestrogenic drugs. Progestogen and antigestagen drugs.
102. Contraceptive (contraceptive) drugs for enteral use. Mechanism of action. Indications and contraindications for use.
103. Preparations of male sex hormones (androgens) and antiandrogenic agents. Drugs, mechanism of action. Indications and contraindications for use. Adverse reactions.
104. Anabolic steroids. Drugs. Mechanism of action. Indications and contraindications for use. Adverse reactions.
105. Vitamin preparations. Vitamins. General biological properties of vitamins. Types of vitamin therapy. Ascorbic acid. Chemical structure. Daily requirement. Pharmacodynamics and pharmacokinetics. Indications and contraindications for use. Vitamin P, preparations. Indications for use.
106. Preparations of B vitamins: thiamine, riboflavin, nicotinic acid, pyridoxine, orotic, pangamic and pantothenic acids. Daily requirement, reasons for deficiency. Indications for use. Adverse reactions.

107. Medicines of fat-soluble vitamins, the commonality of their biological properties. Retinol, its forms. Daily requirement. Pharmacodynamics and pharmacokinetics. Indications for use. Hypervitaminosis A, symptoms, measures of assistance.

108. Vitamin D (ergocalciferol, cholecalciferol). Daily requirement. Pharmacodynamics and pharmacokinetics. Indications for use. Hypervitaminosis D, symptoms, measures of assistance. Features of the use of vitamin D preparations in premature infants and young children.

109. Vitamin E. Preparations. Daily requirement. Pharmacodynamics and pharmacokinetics. The use of vitamin E for preventive and therapeutic purposes.

#### **DRUGS AFFECTING THE CARDIOVASCULAR SYSTEM**

110. Cardiac glycosides. Sources of receipt. General characteristics of the chemical structure. Foxglove preparations of different types. Pharmacological effects. Proposed mechanism of cardiotoxic action. Digitalization, indications for use, side effects.

111. Cardiac glycosides used for heart failure. Characteristics of drugs according to the characteristics of pharmacological action, speed of onset of effect, accumulation. Principles of dosing and administration of drugs.

112. Proposed mechanism of the cardiotoxic action of cardiac glycosides. Pharmacokinetics of cardiac glycosides. Monitoring the effect of cardiac glycosides. Intoxication. Help measures.

113. Antiarrhythmic drugs. General characteristics of the group. Classification. Mechanism of action of sodium channel blockers (quinidine subgroup). Effect on the main parameters of the heart. Indications for use, side effects.

114. Antiarrhythmic drugs, sodium channel blockers (subgroup of lidocaine and flecainide). Features of pharmacological action, indications for use, side effects.

115. Antiarrhythmic drugs, calcium channel blockers and groups of drugs that increase the duration of the action potential. Features of pharmacological action, indications for use, side effects.

116. Antiarrhythmic drugs affecting the efferent innervation of the heart. Classification. Influence on the departments and parameters of the heart. Indications for use, side effects.

117. Antianginal drugs, Basic principles of the antianginal action of these drugs. Classification. Preparations of organic nitrates. Mechanism of action of nitroglycerin, pharmacodynamics, indications for use, side effects.

118. Nitrate preparations used to prevent angina attacks. Pharmacokinetic features of different forms: speed of onset and duration of effect, bioavailability of drugs, severity of the "first pass" phenomenon. 119. Antianginal agents, calcium channel blockers.

Classification. Mechanism of antianginal action. Main pharmacological effects. Indications for use, side effects.

120. The principle of antianginal action of beta-blockers. Indications for use, possible side effects and recommendations for reducing their severity.

121. Antianginal agents that increase oxygen delivery to the myocardium (true coronary lytics of different mechanisms of action). Features of their use in angina pectoris.

122. Basic principles of treatment of myocardial infarction: rationale for the use of various groups of drugs.

123. Classification of lipid-lowering drugs by mechanism of action. Basic principles of prevention and treatment of atherosclerosis. Medicines that bind bile acids.

Mechanism of action. Pharmacokinetics. Indications for use. Side effects.

124. Reductase inhibitors HMC-Coenzyme A. Mechanism of action. Side effects. Indications. Contraindications. Agents that reduce the rate of LDL formation are nicotinic acid and its preparations. Mechanism of action. Indications for use. Contraindications and side effects.

125. Agents that accelerate the removal of VLDL – fibric acid derivatives. Mechanism of action. Indications for use. Side effects. Medicines that stimulate the removal of LDL - probucol. Mechanism of action. Indications for use. Side effects.

126. Antihypertensive drugs. Classification. Mechanism of action, pharmacodynamics, pharmacokinetics, indications for use and side effects of drugs that reduce the tone of vasomotor centers.

127. Antihypertensive substances of peripheral neurotropic action. Mechanisms of action, direction of action on the cardiovascular system. Indications for use and side effects

128. Antihypertensive substances that have direct myotropic effects. Possible mechanisms of action of different subgroups of drugs. Pharmacodynamic effects. Used and side effects.

129. Antihypertensive drugs affecting the renin-angiotensin system. Classification. Mechanism of action, indications for use and side effects.

130. Antihypertensive drugs, Ca-channel blockers. Classification (according to chemical structure and tissue tropism). Mechanism of action and main pharmacological effects. Indications for use and side effects.

131. Antihypertensive effect of diuretics. Mechanisms of hypotensive action. Used and side effects.

132. Hypertensive substances. Classification. The mechanism of action of representatives of different groups. Indications for use.

133. Diuretics (diuretics). Definition. Classification. Saluretics. Mechanism of action and pharmacological effects of loop diuretics. Indications for clinical use. Side effects and contraindications.

134. Moderate saluretics. Mechanism of action and effects of thiazide and thiazide-like diuretics. Indications for clinical use. Side effects and contraindications.

135. Weak saluretics (diacarb, aminophylline). Mechanisms of action. Features of pharmacodynamics. Indications for clinical use. Side effects and contraindications.

136. Potassium-sparing diuretics. Mechanisms of action and pharmacological effects. Indications for clinical use. Side effects and contraindications.

137. Osmotic diuretics. Distinctive features of pharmacodynamics and pharmacokinetics. Indications for clinical use. Side effects and contraindications.

138. Hypotensive effect of diuretics. Features of pharmacodynamics and indications for clinical use in various groups of diuretics.

139. The concept of optional diuretics. Features of diuretic action using examples: ACE inhibitors, Ca-channel blockers.

## **DRUGS AFFECTING ORGAN FUNCTIONS**

## **EXECUTIVE**

140. Analeptics and respiratory stimulants. Definition of the concept and classification. Possible mechanisms of action. Characteristics of drugs. Clinical application. Side effects.

141. Bronchodilators. adrenergic and sympathomimetic groups, M-anticholinergics, myotropic antispasmodics actions. Indications for use. Ways of their introduction. Side effects.

142. Antitussives and expectorants. Characteristics of drugs. Clinical application. Precautions when using centrally acting agents. Mucolytic agents.

143. Drugs used for pulmonary edema. Characteristics of drugs with ganglion-blocking, vasodilating, myotropic action, adrenoblockers, dehydrating and diuretics, antifoams, cardiac glycosides, narcotic analgesics and droperidol, nitrates and anticoagulants.

144. Drugs that affect appetite: stimulants and reducers (anorexigenic). Classification of anorexigenic drugs. Indications and contraindications for use. 145. Drugs used for stomach dysfunction. Drugs that enhance the secretion of gastric glands. Substitution therapy.

146. Drugs that reduce the secretion of gastric glands. Classification. Details about pirenzepine (gastrocepin), H blockers<sub>2</sub>-histamine receptors, proton pump inhibitors - omeprazole. Indications and contraindications for use.

147. Antacids. The concept of systemic and non-systemic antacids.

148. Gastroprotectors, division into groups, characteristics of drugs. Indications and contraindications for use. Chelated and complex preparations (sucralfate, bismuth preparations). Stimulants of motor-evacuation function of the upper gastrointestinal tract (domperidone, metoclopramide).

149. Emetics and antiemetics. Drugs. Indications and contraindications for use.

150. Choleric drugs, divided into groups according to the mechanism of action. Drugs. Indications and contraindications for use.

151. Hepatoprotectors, drugs used for the treatment of chronic viral hepatitis and cirrhosis of the liver, essential autoimmune liver lesions, for the treatment of hepatic dystrophies (hepatosis), as well as drugs for the treatment of cholelithiasis.

152. Myotropic antispasmodics and laxatives. Classification according to chemical affiliation and effect on various parts of the intestine. Drugs. Indications and contraindications for use. Antidiarrheal drugs.

153. Drugs affecting the functions of the pancreas: secretion stimulants (secretin, cholecystokinin), replacement therapy (pancreatin), secretion inhibitors (contrical).

154. Antiplatelet agents. Definition of a group. Classification. Antiplatelet agents from the group of platelet receptor blockers. Mechanism of action. Pharmacological effects. Indications and contraindications for use. Side effects.

155. Antiplatelet agents. Classification. Antiplatelet agents from the group of thromboxane A synthesis blockers<sub>2</sub>. Mechanism of action. Pharmacological effects. Features of clinical use. Indications and contraindications for use. Side effects.

156. Anticoagulants. Definition of a group. Classification. Drugs from the group of low molecular weight heparins. Pharmacodynamic properties and distinctive features of low molecular weight heparins from unfractionated heparin preparations. Application. Contraindications and side effects.

157. Anticoagulants. Classification. Unfractionated heparin preparations. Mechanism of action. Pharmacological effects. Indications and contraindications for use. Side effects. Monitoring of heparin therapy.

158. Indirect anticoagulants. Classification. Mechanism of action. Pharmacological properties. Indications and contraindications for use. Side effects. Laboratory monitoring during therapy with indirect anticoagulants.

159. Procoagulants. Classification. Pharmacological effects. Mechanism of action. Indications and contraindications for use. Side effects. Overdose of anticoagulants - symptoms, treatment.



160. Stimulators of fibrinolysis. Classification. Mechanism of action. Comparative characteristics of the main fibrinolytic agents. Indications and contraindications for use. Side effect.

161. Fibrinolysis inhibitors. Drugs. Mechanism of action. Indications and contraindications for use. Side effects.

162. Stimulators of erythropoiesis. Iron supplements. Classification. Basic principles of treatment of iron deficiency anemia. Toxic reactions of iron preparations. Poisoning with iron preparations, symptoms, measures of assistance.

163. Erythropoiesis stimulants. Medicines used for hyperchromic anemia. Mechanism of action, pharmacodynamic properties. Indications and contraindications for use. Adverse reactions.

164. Stimulators of leukopoiesis. Drugs. Mechanism of action. Indications and contraindications for use. Side effects.

### **DRUGS AFFECTING THE CNS**

165. Anesthesia. Characteristics of liquid volatile and gaseous substances for inhalation anesthesia. Brief physicochemical and pharmacological characteristics of the drugs used (activity, rate of development of the effect, consequences, effect on organs and tissues of the body). Advantages and disadvantages of inhalation anesthesia.

166. Means for non-inhalation anesthesia. Characteristics of drugs by duration of action and routes of administration. Advantages and disadvantages of non-inhalation anesthesia. Combined use of anesthesia and drugs from other pharmacological groups.

167. Ethyl alcohol. Effect on the central nervous system, gastrointestinal tract, cardiovascular system, liver. Application in medical practice. Acute poisoning with ethyl alcohol. Help measures. Chronic alcoholism. Treatment.

168. Principles of organization and structure of the endogenous nociceptive-antinociceptive system. Opiate receptors and their endogenous ligands. Possible mechanisms of opioid analgesia.

169. Opioid analgesics. Definition. Classification. Main indications for the clinical use of opioid analgesics. Limitations, contraindications and possible complications.

170. Natural opioid agonists. Comparative characteristics. Morphine. Main effects. Features of clinical use.

171. Synthetic Agonist opioids. Classification. Comparative characteristic. Features of clinical use and side effects.

172. Opioids are agonists-antagonists. Comparative characteristics. Features of pharmacological activity. Clinical use and possible side effects.

173. Antagonist opioids. Mechanism of action and main indications for use. Acute opioid poisoning, clinical picture, measures of assistance.

174. Chronic opioid poisoning. The mechanism of addiction. Opioid addiction clinic. Treatment. Measures to prevent drug addiction: social and medical aspects of drug addiction.

175. Sleeping pills. Classification of sleeping pills. Benzodiazepine hypnotics Possible mechanisms of action. Effect on sleep structure. Features of their pharmacological action.

176. Barbiturate hypnotics. Possible mechanisms of action of barbiturates. Effect on sleep structure. Comparative characteristics of barbiturates and benzodiazepines as hypnotics. Possibility of developing drug dependence.

177. Characteristics of sleeping pills of different chemical groups. Comparison of them with benzodiazepine and barbiturate hypnotics. Acute poisoning

hypnotics, assistance measures, specific antagonists of benzodiazepines and barbiturates.

178. Antiepileptic drugs. Possible mechanisms of action. General principles of treatment of epilepsy. Their use in various forms of epilepsy. Means for the relief of status epilepticus.

179. Antiparkinsonian drugs. Ideas about the pathogenesis of parkinsonism. Classification by principle of action. Comparative assessment of the effectiveness of individual drugs. Main side effects. Clinical application.

180. Psychotropic drugs. Definition. A brief history of psychopharmacology. Modern classification of psychotropic drugs. General characteristics of the main classes of psychotropic drugs.

181. Antipsychotics (neuroleptics). Definition of the concept. Main pharmacological effects. Mechanism of action. Pharmacological correction of major side effects.

182. Neuroleptics of the phenothiazine series. Classification. Possible mechanisms of action. Characteristics of groups. Pharmacological effects of aminazine, triftazine, etaparazine, fluorophenazine. Side effects of representatives of the phenothiazine series. 183. Neuroleptics, derivatives of butyrophenone, thioxanthene.

Pharmacological characteristics of representatives of these groups. Possible mechanisms of action. Clinical use, contraindications. Side effects and their pharmacological correction.

184. Neuroleptics, derivatives of dibenzodiazepine and benzamide. Pharmacological characteristics of representatives of these groups. Possible mechanisms of action. Clinical use, contraindications. Side effects and their pharmacological correction.

185. Tranquilizers (anxiolytics). Definition of the concept. Main pharmacological effects. Mechanism of action. Main clinical use 186. Anxiolytics, benzodiazepine derivatives. Possible mechanisms of action. Characteristics of representatives of this group. Clinical use, contraindications. Side effects.

187. Anxiolytics, derivatives of various chemical groups. Possible mechanisms of action. Characteristics of representatives of this group. Clinical use, contraindications. Side effects.

188. Sedatives, definition, drugs. Possible mechanisms of action. Indications for clinical use.

189. Drugs for the treatment of mania. Definition of a group. Lithium preparations, possible mechanism of action. Indications for clinical use. Side effects. Other drugs used to treat mania.

190. Antidepressants. Group definitions. Modern classification. Main pharmacological effects. Possible mechanisms of action. Indications for clinical use.

191. Antidepressants, groups of neuronal reuptake inhibitors. Classification. Features mechanisms of action. Indications for clinical use.

192. Antidepressants, group of monoaminoxidase inhibitors (MAO). Classification. Features mechanisms of action. Indications for clinical use. Toxicity.

193. Features of the use of antidepressants in the psychiatry clinic and in somatic medicine. Interaction with other medicinal substances.

194. Psychostimulant substances. Definition of a group. Characteristics of sydnocarb, meridil, caffeine. Mechanism of action. Effect on the central nervous system, cardiovascular system, and other body systems. Indications for clinical use. Side effects.

195. Nootropic drugs. Definition. Main pharmacological effects. Possible mechanisms of action. Indications for clinical use. Differences between their actions and psychostimulant substances.

**9. Description of indicators and criteria for assessing competencies at their stages formation, description of rating scales**

Criteria	Levels of competency development		
	<i>Threshold</i>	<i>Sufficient</i>	<i>High</i>
	Competence formed. Demonstrated threshold, satisfactory sustainable level practical skill	Competence formed. Demonstrated enough level independence, sustainable practical skill	Competence formed. Demonstrated high level independence, high adaptability practical skill

**Competency assessment indicators and rating scales**

Grade "unsatisfactory" (not accepted) or lack of maturity competencies	Grade "satisfactorily" (passed) or satisfactory (threshold) level of development competencies	Rated "good" (passed) or sufficient level development competencies	Excellent rating (passed) or high level development competencies
Inability of the learner to learn independently demonstrate knowledge when solving tasks, lack of independence in application of skills. The lack of confirmation of the development of competence indicates negative results in mastering the academic discipline.	student demonstrates independence in application of knowledge skills and abilities to solve educational tasks in full According to sample given teacher, by tasks, solution of which there were shown teacher, it should be considered that competence formed on satisfactory level.	student demonstrates independent application knowledge, skills and skills at solving tasks, similar samples that confirms Availability formed competencies for higher level. Availability such competence on sufficient level indicates sustainable fixed practical skill	student demonstrates ability to complete independence in choosing a method solutions non-standard assignments within disciplines with using knowledge, skills and skills acquired as in the course of mastering this discipline, and adjacent disciplines should consider competence formed on high level.

### Criteria for evaluating forms of control:

Interviews:

Mark	Description
Great	The mark "EXCELLENT" is given to an answer that shows a solid knowledge of the basic processes of the subject area being studied and is distinguished by the depth and completeness of the topic; mastery of terminology; the ability to explain the essence of phenomena, processes, events, draw conclusions and generalizations, give reasoned answers, give examples; fluency in monologue speech, logic and consistency of response.
Fine	The mark "GOOD" evaluates an answer that reveals a solid knowledge of the basic processes of the subject area being studied, and is distinguished by the depth and completeness of the topic; mastery of terminology; the ability to explain the essence of phenomena, processes, events, draw conclusions and generalizations, give reasoned answers, give examples; fluency in monologue speech, logic and consistency of response. However, one or two inaccuracies in the answer are allowed.
satisfactorily	Mark "SATISFACTORILY" is assessed answer, indicating mainly knowledge of the processes of the subject area being studied, characterized by insufficient depth and completeness of the topic; knowledge of the basic issues of theory; poorly developed skills in analyzing phenomena and processes, insufficient ability to give reasoned answers and give examples; insufficient fluency in monologue speech, logic and consistency of response. There may be several errors in the content of the answer.
unsatisfactory	Mark "UNSATISFACTORY" is assessed answer, revealing ignorance of the processes of the subject area being studied, characterized by a shallow disclosure of the topic; ignorance of the basic issues of theory, unformed skills in analyzing phenomena and processes; inability to give reasoned answers, poor command of monologue speech, lack of logic and consistency. Serious errors in the content of the answer are allowed.

Test control grading scale:

percentage of correct answers	Marks
More than 71	Passed
Less than 71	Not accepted

Skills:

Mark	Description
Great	the student has systemic theoretical knowledge (knows the scheme for prescribing a drug (its dose, concentration, frequency of use), indications and contraindications of prescribed drugs, possible complications, etc.), independently demonstrates the implementation of practical skills without errors

Fine	the student has theoretical knowledge (knows the scheme for prescribing a drug (its dose, concentration, frequency of use), indications and contraindications, possible complications, etc.), independently demonstrates practical skills (prescribes a drug independently), allowing for some inaccuracies (minor errors), which it independently detects and quickly corrects
satisfactorily	the student has satisfactory theoretical knowledge (knows the scheme for prescribing the drug (its dose, concentration, frequency of use), main indications and contraindications, possible complications, etc.), demonstrates the implementation of practical skills, making some mistakes that can be corrected when corrected by the teacher
unsatisfactory	the student does not have a sufficient level of theoretical knowledge (does not know the prescription scheme for the drug (its dose, concentration, frequency of use), indications and contraindications, possible complications, standards, etc.) and/or cannot independently demonstrate practical skills or performs them, allowing gross mistakes

### Evaluation criteria for the test

Mark in the record book	Description
passed	The mark "PASSED" is used to evaluate an answer that reveals a solid knowledge of the basic processes of the subject area being studied and is distinguished by the depth and completeness of the topic; mastery of terminology; the ability to explain the essence of phenomena, processes, events, draw conclusions and generalizations, give reasoned answers, give examples; fluency in monologue speech, logic and consistency of response. However, one or two inaccuracies in the answer are allowed.
not accepted	Mark "NOT PASSED" is assessed answer, revealing ignorance of the processes of the subject area being studied, characterized by a shallow disclosure of the topic; ignorance of the basic issues of theory, unformed skills in analyzing phenomena and processes; inability to give reasoned answers, poor command of monologue speech, lack of logic and consistency. Serious errors in the content of the answer are allowed.

### CHECKLIST FOR EXAMINATION PROCEDURE (in case the study of the discipline ends with an exam)

No.	Examination event*	Points
1	Accounting for points for test lesson No. 1	5

2	Accounting for points for test lesson No. 2	5
3	Accounting for points for test lesson No. 3	5
4	Accounting for points for test lesson No. 4	5
5	Accounting for points for test lesson No. 5	5
6	Accounting for points for test lesson No. 6	5
7	Accounting for points for test lesson No. 7	5
8	Accounting for points for test lesson No. 8	5
9	Accounting for test control scores (in writing)	5
10	Accounting for recipe points (practical skills)	5
eleven	Accounting for points for the answer on the exam card to question No. 1	5
12	Accounting for points for the answer on the exam card to question No. 2	5
13	Accounting for points for answering the exam paper to question No. 3	5
14	Accounting for points for the answer on the exam card to question No. 4	5
Total points for the examination procedure:		70

**Department of Pharmacology and Clinical Pharmacology, Rostov State Medical University, Ministry of Health of the Russian Federation** Discipline: *pharmacology* FULL NAME.

student \_\_\_\_\_ Course \_\_\_\_\_ Faculty: \_\_\_\_\_ Group \_\_\_\_\_ Teacher 1st semester/ 2nd semester \_\_\_\_\_ / \_\_\_\_\_ Absences (in hours): lectures \_\_\_\_\_ / practical classes \_\_\_\_\_  
TICKET № \_\_\_\_\_

*Student rating (in points) in the discipline: pharmacology*

Blocks No.								Rp.	Tests	Theory(questions ticket, no.)				RESULT:
1	2	3	4	5	6	7	8			1	2	3	4	

Final grade \_\_\_\_\_ Teacher's signature \_\_\_\_\_ Date \_\_\_\_\_

less than 70% - unsatisfactory  
71-80% - satisfactory 81-90% - good  
91-100% - excellent

**CHECKLIST FOR EXAMINATION PROCEDURE**

(checklist for the second (commission) retake in case if the study of the discipline ends with a test, a differentiated test, exam)

No.	Examination event*	Points
1	Accounting for points for test lesson No. 1	5
2	Accounting for points for test lesson No. 2	5

3	Accounting for points for test lesson No. 3	5
4	Accounting for points for test lesson No. 4	5
5	Accounting for points for test lesson No. 5	5
6	Accounting for points for test lesson No. 6	5
7	Accounting for points for test lesson No. 7	5
8	Accounting for points for test lesson No. 8	5
9	Accounting for test control scores (in writing)	5
10	Accounting for recipe points (practical skills)	5
eleven	Accounting for points for the answer on the exam card to question No. 1	5
12	Accounting for points for the answer on the exam card to question No. 2	5
13	Accounting for points for answering the exam paper to question No. 3	5
14	Accounting for points for the answer on the exam card to question No. 4	5
Total points for the examination procedure:		70

***Department of Pharmacology and Clinical Pharmacology, Rostov State Medical University, Ministry of Health of the Russian Federation*** Discipline: *pharmacology* FULL NAME.

student \_\_\_\_\_ Course \_\_\_\_ Faculty: \_\_\_\_\_ Group \_\_\_\_ Teacher 1st semester/ 2nd semester \_\_\_\_\_ / \_\_\_\_\_ Absences (in hours): lectures \_\_\_\_\_ / practical classes \_\_\_\_\_  
TICKET № \_\_\_\_\_

<i>Student rating (in points) in the discipline: pharmacology</i>														
Blocks No.								Rp.	Tests	Theory(questions ticket, no.)				RESULT:
1	2	3	4	5	6	7	8			1	2	3	4	

Final grade \_\_\_\_\_ Teacher's signature \_\_\_\_\_ Date \_\_\_\_\_

less than 70% - unsatisfactory  
71-80% - satisfactory 81-90% - good  
91-100% - excellent