



**STATE NON-PROFIT ENTERPRISE «TESTING BOARD FOR PROFESSIONAL
COMPETENCE ASSESSMENT OF HIGHER EDUCATION TRAINEES IN
MEDICINE AND PHARMACY AT THE MINISTRY OF PUBLIC HEALTH OF
UKRAINE»**

Student ID									

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Variant 17

**TEST ITEMS
FOR THE UNIFIED STATE QUALIFICATION EXAM
TEST COMPONENT
STAGE 1**

PHARMACY, INDUSTRIAL PHARMACY

KROK 1

1. What is the name of the process when droplets in emulsions spontaneously merge together?

- A. Sedimentation
- B. Flocculation
- C. Flotation
- D. Coalescence
- E. Coagulation

2. What compound has a primary aromatic amino group in its structure? What reaction can be used to confirm it?

- A. $(CH_3)_3C - NH_2$ (tert-butylamine). Reaction of diazotization and azo coupling
- B. $(CH_3)_3N$ (trimethylamine). Reaction with HCl
- C. $(CH_3)_2NH$ (dimethylamine). Reaction with HCl
- D. $(C_6H_5)_2NH$ (diphenylamine). Diazotization reaction
- E. $C_6H_5 - NH_2$ (aniline). Reaction of diazotization and azo coupling

3. A patient developed an atrioventricular block. What drug is indicated in this case?

- A. Clophelin (Clonidine)
- B. Metoprolol
- C. Anaprilin (Propranolol)
- D. Atropine
- E. Pirenzepine

4. What is the name of the phenomenon when one drug enhances the effect of another?

- A. Withdrawal
- B. Synergism
- C. Tachyphylaxis
- D. Sensitization
- E. Antagonism

5. Colloidal protection is used in the manufacturing of medicinal products. Name the colloidal preparation of silver protected by proteins.

- A. Festal
- B. Collagen
- C. Enzymtal
- D. Protargol
- E. Argentum

6. What two working solutions are used in determination of hydrogen sulfide in mineral waters by means of iodometry (back titration)?

- A. $H_2C_2O_4, KMnO_4$
- B. $I_2, Na_2S_2O_3$
- C. $AgNO_3, H_2SO_4$
- D. $NaOH, HCl$
- E. Na_2CO_3, HCl

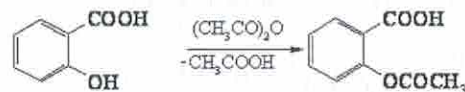
7. After a physical exertion a person developed premature contractions of the cardiac muscle. What type of arrhythmia is it?

- A. Sinus bradycardia
- B. Sinus tachycardia
- C. Extrasystole
- D. Paroxysmal tachycardia
- E. Ventricular fibrillation

8. One of the classifications of titrimetric methods of analysis is based on the chemism of the reaction between the substance being analyzed and the titrant. What reaction is the basis for determining the amount of sodium carbonate using hydrochloric acid?

- A. Neutralization reaction
- B. Sedimentation reaction
- C. Complexation reaction
- D. Hydrolysis reaction
- E. Redox reaction

9. What drug is produced as a result of reaction between salicylic acid and acetic anhydride?



- A. Aspirin
- B. Phenyl salicylate
- C. Sodium salicylate
- D. Salicylamide
- E. Benzyl salicylate

10. What drug can be used to stop a bronchospasm?

- A. Salbutamol
- B. Amoxicillin
- C. Aspirin
- D. Atenolol
- E. Omnoponum

11. In treatment of purulent wounds, a dressing with a certain immobilized enzyme is used. Name this enzyme.

- A. Acid phosphatase
- B. Catalase
- C. Alkaline phosphatase
- D. Arginase
- E. Trypsin

12. In the process of systematic analysis of a cation mixture, iron(III) cations can be determined using the fractional method. What reagent is used for this purpose?

- A. Potassium hexacyanoferrate(II)
- B. Hydrochloric acid
- C. Sodium dihydrogen phosphate
- D. Nitric acid
- E. Potassium chloride

13. A certain meristematic tissue is located in the vascular bundles of the stem between the secondary phloem and the secondary xylem. What type of meristematic tissue is it?

- A. Pericycle
- B. Cambium
- C. Procambium
- D. Phellogen
- E. Dermatogen

14. Analysis of the plant parts detected fragments of rhizomes. Their microscopy revealed periphloematic vascular bundles on section, the presence of which indicates that these samples belong to:

- A. Ferns
- B. Monocotyledons
- C. Dicotyledons
- D. Gymnosperms
- E. Algae

15. What reaction must be conducted by an analytical chemist during the preliminary tests to determine chromium(III) ions?

- A. Reaction with potassium permanganate
- B. Reaction with sodium hydroxide and hydrogen peroxide
- C. Reaction with sodium hydroxide
- D. Reaction with ammonia
- E. Reaction for formation of a perchromic acid after preliminary oxidation of chromium

16. Which one of the substances listed below is not a surfactant?

- A. Sodium palmitate
- B. Sodium stearate
- C. Sodium oleate
- D. Sodium chloride
- E. 1-Pentanol

17. Some leaf cells have lignified membranes. These cells are called:

- A. Companion cells
- B. Sclereids
- C. Trichomes
- D. Collenchyma
- E. Sieve tubes

18. When measuring the antimicrobial activity of drugs, their minimum concentration that suppresses the growth of microbes must be determined. What is this parameter?

- A. The lowest drug concentration that inhibits enzyme biosynthesis in the macroorganism
- B. The lowest drug concentration that inhibits growth of a bacterial test culture
- C. The lowest drug concentration that causes development of selective strains of test cultures
- D. The lowest drug concentration that has a bactericidal effect
- E. —

19. How will the rate of the chemical reaction $2NO(gas) + O_2(gas) = 2NO_2(gas)$ change if the pressure increases by three times?

- A. The rate will decrease by three times
- B. The rate will increase by three times
- C. The rate will increase by 27 times
- D. The rate will remain unchanged
- E. The rate will decrease by 27 times

20. People, who were in the building during a fire, suffer from carbon monoxide poisoning. What type of hypoxia can be observed in this case?

- A. Hypoxic
- B. Circulatory
- C. Respiratory
- D. Tissue
- E. Hemic

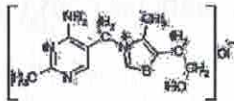
21. What forms when gelatin dissolves in water at an elevated temperature?

- A. Elastic xerogel
- B. Suspension
- C. Molecular solution
- D. Brittle xerogel
- E. Emulsion

22. The inflorescence of a plant has an elongated main axis and sessile flowers. What type of inflorescence is it?

- A. Round capitulum
- B. Flat capitulum
- C. Umbel
- D. Spike
- E. Corymb

23. What two heterocyclic rings are present in the structure of vitamin B_1 (thiamine)?



- A. Pyridazine and thiazole
- B. Pyrimidine and thiophene
- C. Pyridazine and thiophene
- D. Pyrimidine and thiazole
- E. Pyrazine and thiophene

24. A fibrinolysis inhibitor was used to stop postpartum bleeding. Name this drug.

- A. Thrombin
- B. Aminocaproic acid
- C. Calcium chloride
- D. Nettle leaves
- E. Hemostatic sponge

25. Nut shells, cherry pits, and wood are hard because of deposition of a certain substance in the cell membrane. What substance is it?

- A. Chitin
- B. Silica
- C. Calcium carbonate
- D. Suberin
- E. Lignin

26. A potassium chromate solution was added into the solution being analyzed, which resulted in the formation of a yellow precipitate, soluble in acetic acid. What cations were present in the solution, as indicated by this qualitative reaction?

- A. Potassium cations
- B. Ammonium cations
- C. Sodium cations
- D. Magnesium cations
- E. Strontium cations

27. Which phenomenon is uncharacteristic of aerosols?

- A. Coagulation
- B. Thermophoresis
- C. Thermoprecipitation
- D. Photophoresis
- E. Dissociation

28. What enzyme catalyzes the reaction of activation of amino acids and their attachment to a specific tRNA?

- A. Deoxyribonuclease
- B. Nucleotidase
- C. DNA ligase
- D. Ribonuclease
- E. Aminoacyl-tRNA synthetase

29. A person diagnosed with malaria was admitted into the infectious diseases hospital. What route of infection transmission is characteristic of this disease?

- A. Airborne and droplet transmission
- B. Vector-borne transmission
- C. Indirect transmission
- D. Fecal-oral transmission
- E. Direct transmission

30. What is the mechanism of action of the antiviral drug acyclovir?

- A. Blockade of cellular wall synthesis
- B. Inhibition of nucleic acid synthesis
- C. Antagonism with para-aminobenzoic acid
- D. Inhibition of protein synthesis
- E. Increase of cellular membrane permeability

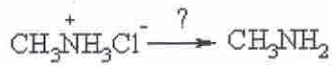
31. Long-term use of antibiotics can result in development of dysbiosis. What method can detect intestinal dysbiosis?

- A. Bacteriology
- B. Serology
- C. Patient interview
- D. Gnotobiotic experiments
- E. Allergy testing

32. A child that attends a day care center fell ill with measles. What is used to prevent this disease in the contact persons?

- A. Measles immunoglobulin
- B. Antibiotics
- C. Sulfanilamides
- D. Measles vaccine
- E. Immunostimulants

33. What reagent is used to transform methylammonium chloride into methylamine?



- A. HCl
- B. N_2
- C. Br_2
- D. O_2
- E. NaOH

34. A doctor prescribed metoprolol to a patient, which helped to lower the patient's blood pressure. This drug belongs to the following pharmacological group:

- A. Beta-blockers
- B. Alpha-blockers
- C. Nicotinic antagonists
- D. Muscarinic antagonists
- E. Sympatholytics

35. During a surgery with application of tubocurarine as a muscle relaxant, the patient developed a respiratory disturbance. The disturbance was eliminated after the patient was administered proserin (neostigmine). What term can be used to describe the interaction between these two drugs?

- A. Cumulation
- B. Antagonism
- C. Incompatibility
- D. Synergism
- E. Tachyphylaxis

36. An infection caused by phytopathogenic mycoplasmas has spread through a plantation of medicinal plants. What feature characterizes this group of microorganisms?

- A. Do not grow on nutrient media
- B. Form spores
- C. Have one flagellum
- D. Die in the presence of oxygen
- E. Have no cellular wall

37. A certain infection leads to fetus malformation if a pregnant woman becomes infected. What vaccine must be

used for the prevention of this infection?

- A. Poliovirus vaccine
- B. Rubella virus vaccine
- C. Antirabic vaccine
- D. Influenza virus vaccine
- E. Mumps vaccine

38. What bacteria indicate the presence of fecal contamination?

- A. Sarcina
- B. Anthracoids
- C. Serratia
- D. Escherichia coli
- E. Klebsiella

39. An autoimmune disorder of islet β -cells was detected in a 14-year-old girl with hyperglycemia, glycosuria, and polyuria. What type of diabetes does this girl have?

- A. —
- B. Gestational diabetes
- C. Type 2 diabetes mellitus
- D. Type 1 diabetes mellitus
- E. Diabetes insipidus

40. A patient looks pale and complains of headache, pain in the heart, and attacks of tachycardia and hypertension. Blood biochemistry test detects significantly increased levels of catecholamines. What gland is likely to be dysfunctional in this case, causing this condition in the patient?

- A. Neurohypophysis
- B. Parathyroid glands
- C. Adrenal cortex
- D. Adrenal medulla
- E. Adenohypophysis

41. What compound is a basis for organic dyes and belongs to isolated polynuclear arenes?

- A. Cumene
- B. Phenanthrene
- C. Triphenylmethane
- D. Anthracene
- E. Benzene

42. Urinalysis of a patient with diabetes mellitus detects glucosuria. What is the renal threshold for glucose reabsorption?

- A. 10 mmol/L
- B. 1 mmol/L
- C. 5 mmol/L
- D. 20 mmol/L
- E. 15 mmol/L

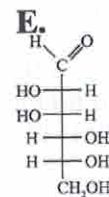
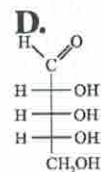
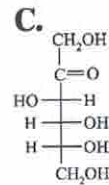
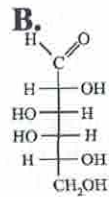
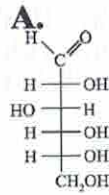
43. Nitrogen oxides can oxidize Fe^{2+} to Fe^{3+} in the hemoglobin molecule, creating a hemoglobin derivative that is unable to bind with oxygen. What hemoglobin derivative is it?

- A. Methemoglobin
- B. Oxyhemoglobin
- C. Deoxyhemoglobin
- D. Carboxyhemoglobin
- E. Carbinemoglobin

44. Conducting tissue cells are live and connected to the sieve tube elements. It is characteristic of:

- A. Tracheids
- B. Sclerenchyma
- C. Companion cells
- D. Collenchyma
- E. Vessels

45. Fructose is a monosaccharide that is a glucose isomer. In medicine, it is used in treatment of hepatic disorders, in dietary nutrition, etc. What structural formula corresponds with *D*-fructose?



46. When a root tip was processed with Lugol's solution, the following was revealed in the cells of the root cap:

- A. Inulin
- B. Compound proteins
- C. Fatty oils
- D. Statolith starch
- E. Glycogen

47. During protein starvation, decreased protein levels in the blood, growth retardation, edemas, and anemia are observed. What is the key factor in the mechanism of edema development, when there is not enough protein in the diet?

- A. Increase of the hemoglobin synthesis
- B. Increase of the globulin synthesis
- C. Decrease of the albumin synthesis
- D. Decrease of the hemoglobin synthesis
- E. Increase of the albumin synthesis

48. People with albinism tend to be very sensitive to sunlight: tan does not

develop and they burn very easily. This phenomenon is caused by problems with synthesis of a certain substance. What substance is it?

- A. Thyroxine
- B. Melanin
- C. Phenylalanine
- D. Tyrosine
- E. Adrenaline

49. Plant fatty acids have an odd number of carbon atoms. What product forms as a result of beta-oxidation of fatty acids with an odd number of carbon atoms?

- A. Oxymethylglutaryl-CoA
- B. Stearoyl-CoA
- C. Palmitoyl-CoA
- D. Propionyl-CoA
- E. Acetoacetyl-CoA

50. What reaction is used to obtain butane $CH_3 - CH_2 - CH_2 - CH_3$ from chloroethane $CH_3 - CH_2 - Cl$?

- A. Zinin reaction
- B. Wurtz reaction
- C. Kononov reaction
- D. Finkelstein reaction
- E. Kucherov reaction

51. What hormone changes glucose levels in the blood and is produced in the pancreas?

- A. Growth hormone
- B. Testosterone
- C. Aldosterone
- D. Somatostatin
- E. Insulin

52. In case of excessive consumption of carbohydrates, insulin stimulates the transformation of carbohydrates into lipids in the cells of adipose tissue. What process is involved in this transformation?

- A. Gluconeogenesis
- B. Lipolysis
- C. Uric acid synthesis
- D. Synthesis of higher fatty acids
- E. Heme synthesis

53. If an alkali is added into the solution being analyzed, the solution produces a gas when heated. This gas changes the color of a moist litmus paper from red to blue, which indicates the presence of the following in the solution:

- A. Carbonate ions
- B. Ammonium ions
- C. Lead ions
- D. Bismuth ions
- E. Chloride ions

54. A 50-year-old man with a history of alcoholic cirrhosis complains of dyspeptic disorders and bleeding from hemorrhoidal veins. Examination detects ascites and distended superficial veins of the anterior abdominal wall. What pathology is indicated by these signs?

- A. Portal hypertension
- B. Hepatitis
- C. Enterocolitis
- D. Intestinal obstruction
- E. Peptic ulcer disease

55. Which compound has the most markedly expressed basic properties?

- A. $CH_3CH_2NH_2$
- B. $CH \equiv CH$
- C. CH_3CH_2SH
- D. CH_3COOH
- E. CH_3CH_2OH

56. Some medicinal plants need to be harvested very carefully, because they are poisonous. One such plant is a representative of *Umbelliferae* family. Name this plant.

- A. *Arctium lappa*
- B. *Cicuta virosa*
- C. *Plantago major*
- D. *Viburnum opulus*
- E. *Valeriana officinalis*

57. A 30-year-old woman complains of frequent nosebleeds. Objectively, she has pale skin, dystrophic changes in her nails, and dry hair with split ends. Complete blood count shows the following: erythrocytes — $2.9 \cdot 10^{12}/L$, Hb — 70 g/L, color index — 0.5, serum iron — 5 $\mu\text{mol}/L$, leukocytes — $6.0 \cdot 10^9/L$, anisocytosis, poikilocytosis, microcytosis. What anemia is observed in the patient?

- A. B12 and folate deficiency anemia
- B. Sickle cell disease
- C. Iron deficiency anemia
- D. Minkowski-Chauffard syndrome
- E. Hemolytic anemia

58. What drug is indicated in case of an overdose of depolarizing muscle relaxants?

- A. Naloxone
- B. Magnesium sulfate
- C. Unithiol
- D. Prozerin (Neostigmine)
- E. Metoprolol

59. What method of titrimetric analysis is used to quantify streptocide (sulfanilamide) with a $KBrO_3$ solution in the presence of KBr ?

- A. Bromatometry
- B. Dichromatometry
- C. Vanadatometry
- D. Iodometry
- E. Permanganometry

60. Administration of adrenaline leads to increased levels of glucose in the blood. What process is mainly activated in this case?

- A. Alcoholic fermentation
- B. Glycogen breakdown
- C. Synthesis of fatty acids
- D. Glycogen synthesis
- E. Pentose phosphate pathway

61. The Wasserman test was positive in a 25-year-old woman. What disease can be diagnosed using this test?

- A. Syphilis
- B. Tuberculosis
- C. Diphtheria
- D. Leptospirosis
- E. Brucellosis

62. A patient suffering from neurosis associated with feelings of anxiety and fear was prescribed diazepam. What pharmacological effect of this drug allows using it in treatment of this condition?

- A. Hypotensive
- B. Antianginal
- C. Anxiolytic
- D. Antiarrhythmic
- E. Anti-inflammatory

63. A 2M solution of HCl was added into the solution being analyzed, which resulted in formation of a white precipitate that turned black when processed with an ammonia solution. What cation is present in this solution?

- A. Hg_2^{2+}
- B. Mg^{2+}
- C. Ag^+
- D. Ba^{2+}
- E. Pb^{2+}

64. What reactions and reagents under certain conditions allow the determination of certain ions in the presence of other ions?

- A. Specific
- B. General
- C. Group
- D. Selective
- E. Characteristic

65. What drug has a hypoglycemic effect because it stimulates pancreatic beta-cells?

- A. Retabolil (Nandrolone)
- B. Prednisolone
- C. Glibenclamide
- D. Heparin
- E. Adrenaline hydrochloride (Epinephrine)

66. Causative agents of infectious diseases can be carried both by humans and animals. What infections affect animals and from them can be passed onto humans?

- A. Mixed
- B. Zoonoses
- C. Zooanthroponoses
- D. Sapronoses
- E. Anthroponoses

67. What method is used for the quantification of medicinal substances with basic properties?

- A. Argentometry
- B. Thiocyanatometry
- C. Complexonometry
- D. Permanganometry
- E. Acidimetry

68. A patient developed a hemorrhage caused by a long-term use of neodicoumarin (ethyl biscoumacetate). What neodicoumarin antagonist must be used in this case?

- A. Aminocaproic acid
- B. Etamsylate
- C. Fibrinogen
- D. Ascorbic acid
- E. Vicasol (Menadione)

69. At the age of 5 months, a child had measles antibodies in the blood. At the age of 1 year, these antibodies were no longer present in the child's blood. Why were these antibodies present in the child's blood?

- A. Acquired natural active immunity
- B. Acquired natural passive immunity
- C. Innate immunity
- D. Artificial immunity
- E. Non-specific resistance

70. Asepsis, antiseptics, disinfection, and sterilization are widely used in pharmaceutical practice. What is the correct definition of the term "asepsis"?

- A. Complete destruction of all forms of microbes in an object
- B. Preventing microbes from contaminating any object
- C. Destruction of pathogenic microbes in the environment
- D. The use of substances that kill microorganisms on the skin and mucosa
- E. The use of substances that kill pathogenic microbes in the internal environment of the body

71. A patient has acute pancreatitis. What is the leading link in the pathogenesis of this disease?

- A. Arterial hypertension
- B. Autoallergy
- C. Disturbed trophism of exocrine pancreatocytes
- D. Early activation of trypsin and elastase
- E. Atherosclerosis of pancreatic vessels

72. Ammoniacal buffer and 8-oxyquinoline solution were added into the solution containing cations of the fifth analytical group, which resulted in formation of a green-yellow precipitate. This qualitative reaction corresponds with the following cations:

- A. Iron(II) cations
- B. Ammonium cations
- C. Manganese cations
- D. Magnesium cations
- E. Calcium cations

73. A patient has persistent tachycardia, exophthalmos, high excitability, and increased basal metabolic rate. What disorder can lead to the development of this syndrome?

- A. Hypothyroidism
- B. Hyperparathyroidism
- C. Adrenal hypofunction
- D. Hyperthyroidism
- E. Hypoparathyroidism

74. Aerosols are one of the dosage forms. Name the phenomenon when aerosol particles move in the direction of decreasing temperature.

- A. Peptization
- B. Photophoresis
- C. Thermophoresis
- D. Sedimentation
- E. Electrophoresis

75. Phenylephrine (mezaton) was administered to a patient with collapse for blood pressure correction. What is the mechanism of hypertensive action of this drug?

- A. Stimulates beta-adrenoceptors
- B. Stimulates alpha-adrenoceptors
- C. Stimulates muscarinic acetylcholine receptors
- D. Stimulates angiotensin receptors
- E. Stimulates nicotinic acetylcholine receptors

76. A patient with essential hypertension was prescribed lisinopril. What is the mechanism of action of this drug?

- A. Inhibits angiotensin-converting enzyme
- B. Blocks β -adrenergic receptors
- C. Blocks muscarinic receptors
- D. Stimulates β -adrenergic receptors
- E. Blocks α -adrenergic receptors

77. What method is used for simultaneous elimination of the effect of foreign substances, concentration, and determination of concentration?

- A. Differential spectrophotometry
- B. Fluorimetry
- C. Polarimetry
- D. Refractometry
- E. Extraction-photometric analysis

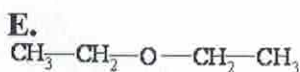
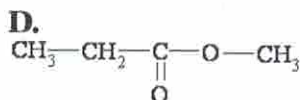
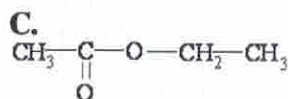
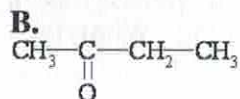
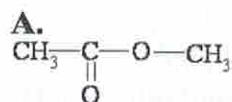
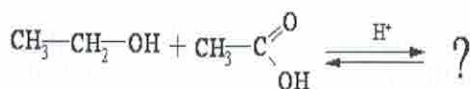
78. A Gram stained smear shows large oval violet cells that form pseudomycelium. Name these microorganisms.

- A. *Penicillium* fungi
- B. *Mucor* fungi
- C. Malaria *emph* Plasmodium
- D. *Candida* fungi
- E. *Actinomyces*

79. One of the methods of methanol poisoning treatment requires administration of ethanol (*per os* or intravenously) in the amount that would have caused intoxication in a healthy person. Why is this treatment method effective?

- A. Ethanol blocks alcohol dehydrogenase coenzyme
- B. Ethanol inactivates alcohol dehydrogenase
- C. Ethanol inhibits methanol diffusion
- D. Ethanol competes with methanol for the active site of alcohol dehydrogenase
- E. Ethanol breaks down faster than methanol

80. What end product forms as a result of ethanol esterification with acetic acid according to the scheme given below?



81. Potentiometric methods of analysis are based on the use of:

- A. Dependence of the volume of the produced gas on the concentration of the analyte
- B. Dependence of the mass of the precipitate on the concentration of the analyte
- C. Dependence of the electromotive force (EMF) of a galvanic cell on the concentration of the analyte
- D. Dependence of the electric current on the concentration of the analyte
- E. Dependence of the volume of the titrant on the concentration of the analyte

82. To prevent the development of muscular dystrophy, a doctor prescribed potassium orotate to a patient. This compound is an intermediate product of the synthesis of a certain substance. What substance is it?

- A. Bile acids
- B. Glucose
- C. Cholesterol
- D. Ketone bodies
- E. Pyrimidine nucleotides

83. The plant organ exhibits radial symmetry, unlimited growth, and positive geotropism. It provides nutrition and fixation in the soil. What organ is it?

- A. Leaf
- B. Seed
- C. Rhizome
- D. Stem
- E. Root

84. Ascorbic acid is not synthesized in the human body and must be supplied with food. What is one of the most important functions of ascorbic acid in the human body?

- A. Participation in hydroxylation reactions
- B. Calcium absorption
- C. Participation in hydrolysis reactions
- D. Participation in phosphorylation reactions
- E. Removal of cholesterol from the body

85. What titration method must be used for determination of a volatile substance?

- A. Titration of separate sample weights
- B. Direct titration
- C. Substitution titration
- D. Back titration
- E. Titration with instrumental fixation of the equivalence point

86. A person suffers from a chronic inflammatory process. In the focus of the inflammation, a certain biochemical process maintains the concentration of NADPH that is necessary for the phagocytosis mechanism to occur. What process is it?

- A. Cori cycle
- B. Ornithine cycle
- C. Pentose phosphate pathway
- D. Glycolysis
- E. Uric acid synthesis

87. Extraction is often used in analysis of medicinal substances. In this method, the degree of extraction of the substance that is being determined depends on the following:

- A. The mass of the substance being extracted
- B. Temperature
- C. pH of the solution
- D. The amount of the substance being extracted
- E. Distribution coefficient

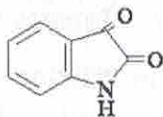
88. A woman came to an endocrinologist with complaints of increased excitability, tachycardia, finger tremor, sweating, and bulging eyes. What is the most likely cause of her condition?

- A. Hypothyroidism
- B. Hyperthyroidism
- C. Hyperparathyroidism
- D. Adrenocortical hyperfunction
- E. Adrenocortical hypofunction

89. A patient has toxic pulmonary edema. What drug must be used for emergency aid in this case?

- A. Hydrochlorothiazide
- B. Diacarb (Acetazolamide)
- C. Mannitol
- D. Spironolactone
- E. Indapamide

90. Isatin molecule contains a ketone group in its structure:



What reagent can be used to prove it?

- A. $[Ag(NH_3)_2]OH$
- B. $NaHCO_3$
- C. $NaOH$
- D. NH_2OH
- E. $CH_3C(O)Cl$

91. Phosphorylation reactions in the cell are catalyzed by enzymes that have the trivial name of "kinases". What class of enzymes do they belong to?

- A. Transferases
- B. Ligases
- C. Oxidoreductases
- D. Lyases
- E. Isomerases

92. What type of ground tissue (by function) is characteristic of above-ground organs of succulents, in particular cacti?

- A. Water storage tissue (hydroparenchyma)
- B. Spongy parenchyma
- C. Folded parenchyma
- D. Aerenchyma (aeriferous parenchyma)
- E. Starch storage parenchyma

93. Cytochrome oxidase enzyme blockade occurred in a person as a result of cyanide poisoning. What type of hypoxia develops in such cases?

- A. Stagnant hypoxia
- B. Tissue hypoxia
- C. Hemic hypoxia
- D. Circulatory hypoxia
- E. Respiratory hypoxia

94. In the formation of lateral roots, the main role belongs to:

- A. Pericycle
- B. Apical meristem
- C. Cambium
- D. Intercalary meristem
- E. Procambium

95. A patient with a malignant tumor suffers from significant weight loss and exhaustion, caused by a certain substance that inhibits the hunger center and stimulates catabolism. Name this substance.

- A. Glucagon
- B. Cachexin
- C. Somatotropin
- D. Aldosterone
- E. Insulin

96. A group of tourists set off for a hiking tour into the mountains. Two hours after the departure, some of them developed tachycardia and shortness of breath, which indicates hypoxia. What type of hypoxia is the cause of these disorders?

- A. Hypoxic hypoxia
- B. Circulatory hypoxia
- C. Hemic hypoxia
- D. Tissue hypoxia
- E. Respiratory hypoxia

97. In plants, the synthesis of secondary reserve starch takes place in:

- A. Chloroplasts
- B. Chromoplasts
- C. Proteinoplasts
- D. Elaioplasts
- E. Amyloplasts

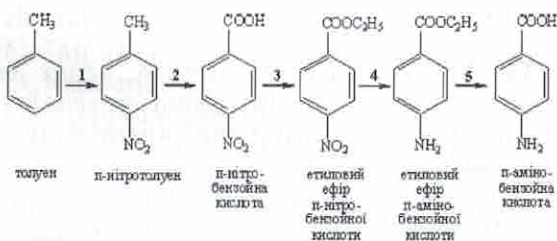
98. According to the Pharmacopoeia, molecular mass of a high-molecular substance must be determined using:

- A. Viscometry
- B. Cryometry
- C. Nephelometry
- D. Potentiometry
- E. Osmometry

99. What potential forms at the interface between two solutions?

- A. Diffusion potential
- B. Electrokinetic potential
- C. Contact potential
- D. Electrode potential
- E. Surface potential

100. At what stage does the esterification reaction occur in the scheme of transformations given below?



- A. 3
- B. 4
- C. 5
- D. 2
- E. 1

101. Antibiotic treatment of infectious diseases belongs to the following type of

pharmacotherapy:

- A. Substitution
- B. Stimulating
- C. Symptomatic
- D. Pathogenetic
- E. Etiotropic

102. A woman with essential hypertension developed a dry hacking cough as a result of taking angiotensin-converting enzyme inhibitors. What drugs that inhibit the renin-angiotensin system should be prescribed in this case?

- A. Sympatholytics
- B. Angiotensin II receptor antagonists
- C. Diuretics
- D. Calcium channel blockers
- E. Beta-blockers

103. Ammonia is a highly toxic substance, especially for the nervous system. This toxic product binds with a certain metabolite of the tricarboxylic acid cycle, forming glutamate and glutamine. What metabolite is it?

- A. Citrate
- B. Alpha-ketoglutarate
- C. Fumarate
- D. Malate
- E. Succinate

104. A pus sample taken from the urethra had been inoculated on ascitic agar, which resulted in the growth of round transparent colonies. Microscopy of the colonies detects Gram-negative bean-shaped diplococci. What causative agent is it?

- A. Gonococcus
- B. Streptococcus
- C. Pneumococcus
- D. Micrococcus
- E. Meningococcus

105. A 34-year-old woman with bronchitis presents with persistent dry non-productive cough. Her physician prescribed her a centrally acting antitussive drug. Name this drug.

- A. Mucaltin
- B. Glaucine
- C. Ambroxol
- D. Bromhexine
- E. Acetylcysteine

106. HIV-infection occupational risk groups include people of various

professions, healthcare workers included. What is the most likely route of infection transmission to healthcare workers?

- A. Transmission via airborne dust particles
- B. Droplet transmission
- C. Fecal-oral transmission
- D. Parenteral transmission
- E. Vector-borne transmission

107. Leaves of a *Lamiaceae* family plant are ovate, with a crenate margin, darker on the top than on the bottom, and have a characteristic lemon-like smell. These are the features of the following plant:

- A. *Salvia officinalis*
- B. *Melissa officinalis*
- C. *Mentha piperita*
- D. *Lamium album*
- E. *Leonurus cardiaca*

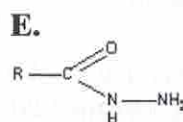
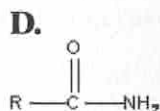
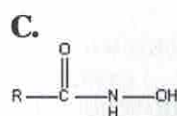
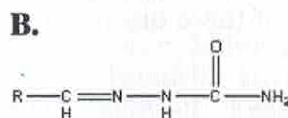
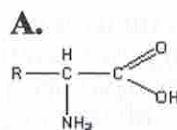
108. Chitinization is a type of change in cell membranes. In what organisms is this phenomenon observed?

- A. Gymnosperms
- B. Ferns
- C. Higher spore plants
- D. Woody plants
- E. Fungi

109. During a regular check-up, a person presents with enlarged thyroid gland, exophthalmos, fever, and elevated heart rate of 110/min. What hormone should be measured in the patient's blood in this case?

- A. Glucagon
- B. Cortisol
- C. Testosterone
- D. Thyroxine
- E. Insulin

110. What compound is a hydroxamic acid?



111. What substance is used as a primary standard in permanganometry, bromatometry, dichromatometry, iodometry, and cerimetry?

- A. Potassium hydroxide
- B. Arsenic(III) oxide
- C. Sodium chloride
- D. Sodium carbonate
- E. Ammonium acetate

112. What is the mechanism of action of a catalyst in a chemical reaction?

- A. Changes the nature of the reagents
- B. Does not change the activation energy
- C. Reduces activation energy
- D. Changes the degree of dispersion
- E. Increases activation energy

113. What anticholinesterase agent is used to stimulate intestinal peristalsis in the patients during the postoperative period?

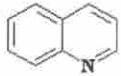
- A. Metoprolol
- B. Adrenaline hydrochloride
- C. Dithylin (Suxamethonium)
- D. Salbutamol
- E. Prozerin (Neostigmine)

114. What parameter is measured during conductometric titration of electrolyte solutions?

- A. Viscosity of the solution
- B. Acidity of the environment
- C. Concentration of the solution
- D. Electrical conductivity
- E. Electromotive force

115. Select the quinoline formula among the structural formulas given below:

A.



B.



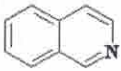
C.



D.



E.



116. Ascorutin is used in treatment of bleeding gums and punctate hemorrhages. What vitamin does it contain?

- A. K
- B. C
- C. D
- D. A
- E. E

117. What drug is used in treatment of herpes infection?

- A. Sabin's vaccine
- B. Acyclovir
- C. Tamiflu (Osetamivir)
- D. Rimantadine
- E. Gamma globulin

118. Microscopy of plants detects parenchymal cells with thin membranes, a large nucleus, and a large number of ribosomes. What tissue is it?

- A. Secretory tissue
- B. Meristematic tissue
- C. Mechanical tissue
- D. Parenchyma
- E. Dermal tissue

119. The structure of the bacterial cell that provides microbes with increased

resistance to the environmental factors and can remain intact for a long time can be detected by staining a smear according to the Ozheshko technique. What is this structure called?

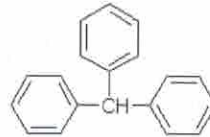
- A. Flagella
- B. Spore
- C. Pilus
- D. Capsule
- E. Plasmid

120. Quantitative determination of copper salts by photometry must be conducted according to the calibration graph that is built within the following coordinates:

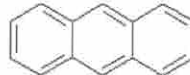
- A. Light absorption intensity — wavelength
- B. Optical density — concentration
- C. Optical density — temperature
- D. Optical density — liquid layer thickness
- E. Optical density — wavelength

121. Which compound of those listed below is a condensed arene?

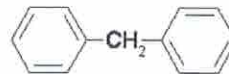
A.



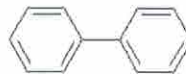
B.



C.



D.



E.



122. What changes occur with physical adsorption of substances, when temperature increases?

- A. Physical adsorption increases in homogeneous systems
- B. Physical adsorption decreases in heterogeneous systems
- C. Physical adsorption decreases
- D. Physical adsorption transforms into chemisorption
- E. Physical adsorption increases

123. What reagent can be used to distinguish between ethanol (C_2H_5OH) and glycerine ($CH_2OH - CHOH - CH_2OH$)?

- A. $FeCl_3$
- B. $KMnO_4$
- C. $Cu(OH)_2$
- D. Ag_2O
- E. HBr

124. Examination of a patient with edemas detects proteinuria, arterial hypertension, hypoproteinemia, and retention hyperlipidemia. What syndrome is it?

- A. Nephrotic
- B. Urinary
- C. Hypertensive
- D. Anemic
- E. Urate

125. What indicator is necessary for titration of a potassium iodide solution using a silver nitrate solution (direct titration)?

- A. Ammonium iron(III) sulfate
- B. Starch solution
- C. Methyl orange
- D. Fluorescein
- E. Tropeolin 00

126. What functional groups can be observed in the cyclic forms of ribose and deoxyribose?

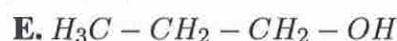
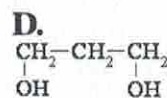
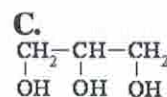
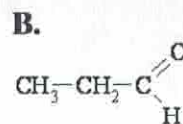
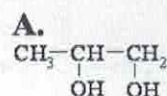
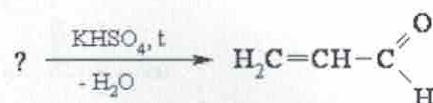
- A. Hydroxylic
- B. Carboxylic
- C. Hydroxylic and aldehyde
- D. Aldehyde
- E. Hydroxylic and carboxylic

127. What compound will form as a result of 3-methylpyridine oxidation according to the scheme given below?



- A. Nicotinic acid
- B. Picolinic acid
- C. 3-Hydroxypyridine
- D. Isonicotinic acid
- E. 2-Hydroxypyridine

128. What compound forms acrolein when heated with water-removing reagents?



129. At the end of his shift, a worker of the steel foundry felt dizziness and fever of $38.5^\circ C$. What condition can be observed in this worker?

- A. Hypothermia
- B. Decompression
- C. Hyperthermia
- D. Hypertension
- E. Fever

130. An analytical laboratory expert performs direct iodometric determination of ascorbic acid. What indicator must be used in this case?

- A. Methyl orange
- B. Diphenylamine
- C. Methyl red
- D. Phenolphthalein
- E. Starch

131. How does the value of the critical micelle concentration in homologous series change with an increase in the molecular mass of the surfactant?

- A. Reaches its maximum and then decreases
- B. Sharply increases
- C. Decreases
- D. Increases
- E. Remains unchanged

132. Insulin is a pancreatic hormone with a hypoglycemic action. Chemically, it can be classified as a:

- A. Polypeptide
- B. Carbohydrate
- C. Steroid
- D. Nucleotide
- E. Lipid

133. Alanine is an important substrate of gluconeogenesis in the liver. What is the reaction, in which alanine forms in skeletal muscles from pyruvate?

- A. Isomerization
- B. Transamination
- C. Decarboxylation
- D. Dehydrogenation
- E. Phosphorylation

134. What changes in leukogram are most characteristic of helminthiasis?

- A. Monocytosis
- B. Lymphocytosis
- C. Basophilia
- D. Eosinophilia
- E. Neutrophilia

135. What groups of antibiotics can be classified as beta-lactam antibiotics?

- A. Penicillins, cephalosporins, monobactams, carbapenems
- B. Penicillins, cephalosporins, tetracyclines
- C. Penicillins, cephalosporins, macrolides, carbapenems
- D. Cephalosporins, macrolides, aminoglycosides
- E. Cephalosporins, monobactams, aminoglycosides

136. A leaf has 5–7 identical veins that branch many times. What type of leaf venation is it?

- A. Pinnate reticulate
- B. Arcuate
- C. Parallel
- D. Palmate marginal
- E. Palmate reticulate

137. What is the order of the

kinetic equation that describes the process of coagulation according to the Smoluchowski theory of rapid coagulation?

- A. Second order
- B. Fractional order
- C. Third order
- D. First order
- E. Zero order

138. The C_2H_4 (alkene) \rightarrow C_2H_6 (alkane) transformation occurs in the following reaction:

- A. Hydration
- B. Dehydrogenation
- C. Hydrogenation
- D. Dimerization
- E. Dehydration

139. To quickly stop an attack of angina pectoris, a 55-year-old patient was prescribed an organic nitrate drug. What drug is it?

- A. Labetalol
- B. Octadine (Guanethidine)
- C. Nitroglycerin
- D. Prazosin
- E. Nifedipine

140. What product forms as a result of a reaction between aniline and benzaldehyde?

- A. N-benzylideneaniline
- B. N,N-dimethylaniline
- C. Oxime
- D. Cyanohydrin
- E. Hemiacetal

141. What is the color of the compound that forms as a result of reaction between salicylate ions and Fe^{3+} ions in an acidic environment?

- A. Blue
- B. Green
- C. Violet
- D. Black
- E. Brown

142. What product forms as a result of aldehydes and ketones reacting with primary amines?

- A. Nitrile
- B. Azomethine
- C. Diazine
- D. Thiol
- E. Alcohol

143. Calculation of the phase transformation temperature under varying pressure is of extreme practical importance to the modern pharmaceutical industry. This temperature can be calculated using the:

- A. Konovalov rules
- B. Clausius-Clapeyron equation
- C. Trouton's rule
- D. Gibbs phase rule
- E. Mendeleev-Clapeyron equation

144. A 33-year-old woman was admitted into a psychiatric hospital with an anxiety disorder of neurotic origin. What drug is indicated in this case?

- A. Diazepam
- B. Naloxone
- C. Droperidol
- D. Levodopa
- E. Valerian extract

145. What will be the order of the reaction if one of the reagents participating in a bimolecular reaction was taken in a large excess?

- A. The order can be determined based on the substance taken in excess
- B. The order would be greater than the molecularity
- C. Third order
- D. The order would be the same as the molecularity
- E. Pseudomonomolecular order

146. Examination of the patient's oral cavity detects roseola rash, pustules, and papules on the mucosa of the soft palate. Microscopy of the smears prepared from the discharge and stained according to Romanowsky-Giemsa revealed pale pink wavy microorganisms. What microorganisms are the likely cause of this pathology?

- A. *Treponema pallidum*
- B. Staphylococci
- C. Streptococci
- D. *Candida* fungi
- E. Meningococci

147. Polarography is one of the electrochemical methods of analysis. What parameter is used in polarographic analysis to identify the substance being analyzed?

- A. Position of a polarographic wave
- B. Magnitude of the electromotive force
- C. Height of a polarographic wave
- D. Width of a polarographic wave
- E. Half-wave potential

148. Sedimentation is characteristic of the following type of systems:

- A. Suspensions
- B. Solutions of high-molecular compounds
- C. Nonelectrolyte solutions
- D. Foams
- E. Electrolyte solutions

149. Microbiological study of dried medicinal plants shows that they were contaminated with clostridia. What feature is characteristic of this group of microorganisms?

- A. Gram-negative
- B. —
- C. Nonpathogenic for humans
- D. Spore-formers
- E. Obligate aerobes

150. What drugs can be classified as angiotensin-converting enzyme (ACE) inhibitors?

- A. Dibazol (bendazol), papaverine
- B. Raunatin, reserpine
- C. Losartan, irbesartan
- D. Nifedipine, diltiazem
- E. Captopril, enalapril