1. Microscopic examination of absorption zone of primary root cortex revealed that it consisted mainly of loose multilayer living parenchyma with amyloid granules. It is called:

a. Collenchyme
b. Phellogene
c. Endoderm
d. Exoderm
e. Mesoderm

2. An excess of concentrated ammonium hydroxide is a group reagent for the cations of the VI analytical group (acidbase classification) Co2+, Ni2+, Cd2+, Cu2+, Hg2+. In this case the following substances are formed:

a. Hydroxides of the cations insoluble in the excess of ammonium hydroxide
b. Water-soluble ammonia complexes
c. Stained, water-insoluble compounds
d. Hydroxides of acid-soluble cations
e. Hydroxides of alkali-soluble cations

3. Both external and internal indicators are used in the following titrimetric method of analysis

a. Nitritometry
b. Chelatometry
c. Argentometry
d. Permanganatometry
e. Alkalimetry

4. Which of the listed reactions indicates the basic properties of pyridine?

a.
b.
c.
d.
e.

5. Estimation of temperature of phase transition at different pressures is of great practical importance for modern pharmaceutical industry and can be done by applying:

a. Konovalov law
b. Clapeyron-Clausius equation
c. Gibbs' phase rule
d. Trouton's rule
e. Mendeleev-Clapeyron equation

6. A patient with ischemic heart disease has been administered inosine, which is an intermediate metabolite in the synthesis of:

a. Glycoproteins
b. Ketone bodies
c. Metalloproteins
d. Lipoproteins
e. Purine nucleotides

7. Examination of the lower limbs of a 40-year-old patient with coronary artery disease and vascular disease of the lower limbs (obliterating endarteritis) revealed skin pallor and dystrophy, local temperature decrease, sense shock, pain. The patient is likely to have the following disorder of the peripheral blood circulation:

a. Obstruction ischemia
b. Angiospastic ischemia
c. Arterial hyperaemia
d. Venous hyperaemia
e. Compression ischemia

8. A patient has been found to have sugar in the urine. Blood glucose is normal. Arterial pressure is

normal. What is the mechanism of glycosuria development in this case?

a. Disturbance of glucose reabsorption in the nephron tubules

b. Hyperfunction of adrenal medulla

c. Hyperfunction of adrenal cortex

d. Hyperfunction of thyroid gland

e. Insulin deficiency

9. What compound is formed by heating α-hydroxypropionic acid?

a.

b.

c.

d.

e.

10. Rates of chemical reactions of the same order are compared by:

a. Chemical reaction rate

b. Change in the reactants concentration

c. Change in the concentration of the reaction products

d. Constant of chemical reaction rate

e. Endpoint of a reaction

11. Amylolytic enzymes catalyze the hydrolysis of polysaccharides and oligosaccharides. They have an effect upon the following chemical bond:

a. Glycosidic

b. Peptide

c. Phosphodiester

d. Amide

e. Hydrogen

12. Which of the following names corresponds with the formula:

a. Anthranilic acid amide

b. Nicotinic acid amide

c. Picolinic acid amide

d. Isonicotinic acid amide

e. Salicylic acid amide

13. What indicator is used for the quantitative determination of sodium carbonate in a preparation by the method of acidbase titration?

a. Murexide

b. Diphenylamine

c. Ferroin

d. Methyl orange

e. Methylene blue

14. Depressive states can be treated by means of drugs inhibiting the enzyme that inactivates biogenic amines. Specify this enzyme:

a. LDH (lactate dehydrogenase)

b. AST (aspartate aminotransferase)

c. ALT (alanine aminotransferase)

d. MAO (monoamine oxidase)

e. CPK (creatine phosphokinase)

15. Solutions of some electrolytes are used as medications. What is the maximum value of the isotonic coefficient for MgSO4 solution?

a. 5

b. 7

c. 4

d. 3

e. 2

16. What substance blocks the conduction of excitation in the neuromuscular synapses?
a. Adrenaline
b. Noradrenaline
c. Curare
d. Somatostatin
e. Aspartate

17. The labels of some medications have an inscription: Shake before use! This warning is caused by:
a. Solubility of disperse systems
b. Coagulation
c. Sedimentation
d. Insolubility of disperse systems
e. None of the above

18. Which of these formulas corresponds with acetoacetic acid?
a.
b.
c.
d.
e. ВідповідіТривалістьІндекси питанняКорекція питанняЗалишилось:183Розпочато:16год. 2хв.Правильних:1390Заданих:17Минуло:0год. 0хв.Хибних:978Правильних: / %Залишилось:3год. 19хв.Дисперсія:28.17%Всього:200На питання:0хв. 0сек.Складність:41.3%

19. Blood serum electrophoresis revealed interferon. This protein is in the following fraction:
a. Albumins
b. γ-globulins
c. α2-globulins
d. α2-globulins
e. β-globulins

20. Proteolytic enzymes of gastric juice exhibit maximum activity in the medium with the following pH:
a. pH 6,5
b. pH 9,0
c. pH 0,5-1,0
d. pH 3,2-3,5
e. pH 7,0

21. After taking phenacetin a patient developed acute sore throat, body temperature rise. Examination allowed doctors to make a diagnosis of necrotic angina and agranulocytosis. Agranulocytosis can be characterized by a decrease in the amount of the following WBCs:
a. Lymphocytes
b. Monocytes
c. Eosinophils
d. Basophils
e. Neutrophils

22. A newborn born to an Rh-negative mother (3rd pregnancy) presents with progressing jaundice, symptoms of CNS excitation, anemia. What type of jaundice is it?
a. Obstructive
b. Parenchymatous
c. Hemolytic
d. Parasitic
e. Toxic

23. A plant under examination has papilionaceous flower. This plant belongs in the family:
a. Ranunculaceae

b. Scrofulariaceae
c. Fabaceae
d. Lamiaceae
e. Asteraceae

24. Van’t Hoff’s rule is used for determining the shelf life of drugs. The temperature coefficient of the rate of most chemical reactions lies within the following range:
a. 2-3
b. 3-4
c. 1-5
d. 2-4
e. 1-3

25. In an emergency situation a scuba diver has quickly risen from the depths to the surface, which is against the rule. He is unconscious, presents with respiratory failure and cardiac activity disorder as a result of decompression sickness. What complication may develop in the scuba diver?
a. Gas embolism
b. Air embolism
c. Thromboembolism
d. Cellular embolism
e. Fat embolism

26. A patient has been hospitalized for chronic heart failure. Objectively: skin and mucous membranes are cyanotic, the patient has tachycardia, tachypnea. What type of hypoxia has developed in the patient?
a. Circulatory
b. Hemic
c. Hypoxic
d. Tissue
e. Anemic

27. The solid residue obtained after evaporation of the sample solution makes the colorless flame of burner turn yellow, and when watched through a blue glass, it looks purple. What cations are present in the solid residue?
a. Na+, K+
b. Na+ , Sr2+
c. Na+, Ca2+
d. Li+, Ba2+
e. Ca2+, K+

28. Amino group of p-aminobenzoic acid is involved into reaction with the following reagent:
a. NaOH
b. NH4OH
c. HCl
d. CH3COONa
e. KCN

29. Urine analysis revealed a decrease in sodium ion concentration. Which hormone provides an enhanced reabsorption of sodium ions in the convoluted nephron tubules?
a. Adrenaline
b. Acetylcholine
c. Vasopressin
d. Somatostatin
e. Aldosterone

30. Thermodynamic calculations allow us to determine the possibility and direction of spontaneous processes. In an isolated system the change of the following thermodynamic function is used for this purpose:

a. Gibbs energy
b. Internal energy
c. Enthalpy
d. Entropy
e. Helmholtz energy

31. Histochemical test for fixed oils with sudan III results in the following stain colour:
a. Black and purple
b. Pink and orange
c. Lemon-yellow
d. Blue and violet
e. Raspberry-red

32. The strongest acid among the hydrohalic acids is:
a. Hydrochloric
b. Hydrofluoric
c. Hydroiodic
d. Hydrobromic
e. -

33. A solution contains cations of zinc and aluminum. Specify the reagent that allows to detect cations of zinc in this solution:
a. Potassium hexacyanoferrate (II) solution
b. Cobalt nitrate Co(NO3)2
c. Sulfuric acid solution
d. Excess of 6M sodium hydroxide in presence of hydrogen peroxide
e. Sodium hydroxide solution

34. In a solution containing cations of copper (II) and zinc, the copper cations can be identified by means of the excess of the following reagent:
a. 2M sulfuric acid solution
b. 2M hydrochloric acid solution
c. 2M solution of ammonium carbonate
d. 6M ammonia solution
e. 6M potassium hydroxide solution

35. Concentration of magnesium sulfate in a drug can be determined by complexometric titration. Choose an indicator to detect the end point of titration:
a. Phenolphtalein
b. Eosin
c. -
d. Chromogen black
e. Methyl orange

36. Choose a pair of electrodes for potentiometric pH measurement of a solution:
a. Quinhydrone and antimonial
b. Calomel and silver chloride
c. Glass and silver chloride
d. Mercury sulphate and silver chloride
e. Glass and antimonial

37. Microscopic examination of a perennial stem revealed integumentary tissue of secondary origin that was formed as a result of cell division of:
a. Phellogen
b. Cambium
c. Protoderma
d. Pericycle
e. Procambium

38. Heart rate of a person at rest is 40/min. What structure is the pacemaker of heart in this man?
a. Its bundle branches
b. Purkinje fibers
c. Sinoatrial node
d. Its bundle
e. Atrioventricular node

39. The volume of air exhaled by a healthy person during quiet breathing was measured with a spirometer, it was 0,5 liter. What is this volume called?
a. Vital capacity of lungs
b. Residual volume
c. Inspiratory reserve volume
d. Expiratory reserve volume
e. Tidal volume

40. A 40-year-old patient has developed polyuria (10-12 liters per day) and polydipsia induced by damage to the hypothalamo-hypophyseal tract. What hormone deficiency causes such disorders?
a. Vasopressin
b. Corticotropin
c. Thyrotropin
d. Somatotropin
e. Oxytocin

41. The rate of a chemical reaction does not depend on the concentration of the reactants. Specify the order of such reaction:
a. Third
b. Fraction
c. First
d. Second
e. Zeroth

42. Sulfonamides are widely used as bacteriostatic agents. The mechanism of antimicrobial action of sulfonamides is based on their structural similarity to:
a. Folic acid
b. Glutamic acid
c. Para-aminobenzoic acid
d. Nucleic acid
e. Antibiotics

43. Specify the reaction conditions (medium, to) in the standardization of potassium permanganate solution by sodium oxalate solution:
a. Acidic, cooling
b. Neutral, cooling
c. Neutral, heating
d. Alkaline, heating
e. Acidic, heating

44. Which of the acids with the same concentration has the highest ionization degree (α)?
a. CH3COOH K=1,74×10-5
b. C6H5COOH K=6,3×10-5
c. NH2(CH2)2COOH K=2,6×10-11
d. HCOOH K=1,74×10-4
e. NH2CH2COOH K=1,70×10-10

45. Select the correct name for the given compound:
a. 2,7-Dinitronaphthalene
b. 4,9-Dinitronaphthalene
c. 1,6-Dinitronaphthalene

d. 4,8-Dinitronaphthalene
e. 1,5-Dinitronaphthalene

46. Acylated amino group acts as a substituent of the following type:
a. Type I
b. Type I and II at the same time
c. Impossible to determine
d. Acetanilide does not take part in the SE reactions
e. Type II

47. Halide ions in drugs are determined by titration based upon the reaction of:
a. Substitution
b. Oxidation-reduction
c. Precipitation
d. Acid-base
e. Complexing

48. In the qualitative analysis which involves precipitation of sulphates of the third analytical group cations (Ca2+, Sr2+, Ba2+) the solubility of sulphates can be reduced by adding:
a. Amyl alcohol
b. Ethyl alcohol
c. Benzene
d. Distilled water
e. Chloroform

49. Lithium carbonate is used in medicine for the prevention and treatment of psychoses of different etiology. Li_2CO_3 can react with the following compound:
a. KCl
b. HCl
c. $LiNO_3$
d. NaCl
e. KNO_3

50. Drugs are commonly analyzed by means of potentiometric pH measurement. Which of the electrodes can be used for measuring the solution pH?
a. Standard hydrogen
b. Calomel
c. Chlorine-silver
d. Glass
e. Zinc

51. The ability of reagent to ensure a stable analytical effect in the interaction with the analyzed substance is characterized by:
a. Reaction sensitivity
b. Reaction specificity
c. -
d. Reagent amount
e. Reaction selectivity

52. To maintain a certain value of medium-pH the buffer solutions are used. Specify a composition of substances that DOES NOT HAVE buffer properties:
a. NaH_2PO_4+ Na_2HPO_4
b. NaOH + NaCl
c. NH_4Cl +$NH_3 \cdot H_2O$
d. CH_3COOH + CH_3COONa
e. HCOOH + HCOONa

53. What solution can be determined by photocolorimetric method by selfabsorbance?
a. Potassium chloride

b. Potassium nitrate
c. Potassium phosphate
d. Potassium chromate
e. Potassium sulphate

54. Uric acid is a derivative of:
a. Pyrazole
b. Pyridine
c. Indole
d. Pyrazine
e. Purine

55. What class of reactions does this reaction relate?
a. Oxidation
b. Rearrangement
c. Substitution
d. Reduction
e. Addition

56. While studying a stem covered with periderm, the researcher realized that gas exchange takes place through?
a. Hydatodes
b. Lenticels
c. Pores
d. Stomata
e. Non-suberized (conducting) cells

57. Which of the ligands is bidentate?
a. Thiocyanate ion
b. Pyridine
c. Hydroxide ion
d. Ethylenediamine
e. Cyanide ion

58. An expression for the hydrolysis constant Kg = Kw / (Kacid × Kbase) corresponds with the following salt:
a. NaCN
b. Li2S
c. NH4Cl
d. (NH4)2S
e. Fe(NO3)3

59. The conversion MnO_4^- → MnO_2 represents the following reaction:
a. Oxidation in alkaline medium
b. Reduction in alkaline medium
c. Oxidation in acidic medium
d. Reduction in acidic medium
e. Reduction in neutral medium

60. The high energy from thermal dissociation of CO molecule (the binding energy of 1075 kJ) results from:
a. Triple bond between the atoms of oxygen and carbon
b. Ionic bond
c. Hydrogen bond
d. High polarity of the molecule
e. Covalent bond

61. The sodium-potassium pump functioning in a cell is responsible for the transport of the following ions across the membrane:

a. Sodium ions out of the cell, potassium ions into the cell
b. Sodium ions into the cell, potassium ions out of the cell
c. Sodium ions into the cell, chlorine ions out of the cell
d. Chlorine ions into the cell, potassium ions out of the cell
e. Calcium ions into the cell, potassium ions out of the cell

62. In terms of water-air interface, the following substance acts as a surfaceactive substance:
a. HCl
b. Urea
c. -
d. Valeric acid
e. NaOH

63. A patient consulted a doctor about sunburns, decreased visual acuity.His hair, skin and eyes are not pigmented. He has been diagnosed with albinism. The patient presents with the following enzyme deficiency:
a. Histidine decarboxylase
b. Hexokinase
c. Arginase
d. Carbonic anhydrase
e. Tyrosinase

64. The causative agent of botulism causes severe food poisoning. Specify the most characteristic morphological feature of botulism causative agent:
a. Gram-positive bacillus with terminal spore
b. Thick gram-positive non-spore-forming bacillus
c. Gram-positive bacillus with subterminal spore
d. Thin mobile bacillus with central spore
e. Thick gram-positive bacillus without spores and flagella

65. After the Cannizzaro reaction for benzaldehyde the following compound is obtained:
a.
b.
c.
d.
e.

66. Specify the reaction, through which salicylic acid can be synthesized:
a. -
b.
c.
d.
e.

67. Fatty degeneration of liver is prevented by lipotropic substances. Which of the following substances relates to them?
a. Glycine
b. Glucose
c. Cholesterol
d. Bilirubin
e. Methionine

68. Alkaline reaction is typical for the solution of the following salt:
a. Na2SO4
b. CuCl2
c. FeCl3
d. Na2S
e. KCl

69. Nitrite ions in presence of nitrate ions can be detected by means of:
a. Diphenylcarbazone
b. Crystalline antipyrine in presence of dilute HCl
c. Dimethylglyoxime
d. Crystalline sodium thiosulfate
e. Crystalline iron (III) sulfate

70. Which of the following substances relates to colloidal surface-active substances?
a. Sodium chloride
b. Iodine
c. Potassium oleate
d. Polyethylene
e. Gelatin

71. The cause of optical activity is the presence of the following organic compound in the molecular structure:
a. Plane of symmetry
b. Asymmetric carbon atom
c. Triple bond
d. Double bond
e. Functional group

72. Given the ability of iodine to dissolve in nonpolar solvents, determine the type of chemical bond in an I2 molecule:
a. Polar covalent
b. Ionic
c. Nonpolar covalent
d. Metal
e. Intermolecular interaction

73. Aqueous solution of CaCl2 with mass concentration 10% is used for intravenous injections. What is the maximum value of isotonic coefficient of CaCl2 in an aqueous solution?
a. 4
b. 5
c. 1
d. 3
e. 2

74. Cryoscopic constants of water, benzene, chloroform, acetic acid and camphor equal to 1,86; 5,12; 4,9; 3,9; 40,0 respectively. Which of these solvents should be selected for the most accurate determination of the molar mass of a drug substance (nonelectrolyte) by the cryoscopic method?
a. Camphor
b. Acetic acid
c. Water
d. Benzene
e. Chloroform

75. Which of the listed carbonyl compounds gives a positive iodoforme reaction?
a.
b.
c.
d.
e.

76. Which of these reactions can be used to identify the primary amino group?
a.
b.
c.

d.
e.

77. For the quantitative analysis of ethanol the gas chromatography was used. Which parameter was measured?
a. Peak width
b. Peak width at half height
c. Retention time
d. Retention volume
e. Peak height or area

78. Potassiumpermanganate reacting with hydrogen peroxide in acidic medium acts as:
a. Oxidant
b. Disproportionation agent
c. Does not act either as an oxidant, or as a reductant
d. Oxidant and reductant
e. Reductant

79. Specify the number of electrons involved into formation of the isolated conjugated system in the pyrimidine molecule:
a. 8
b. 6
c. 10
d. 4
e. 2

80. A patient has an increased concentration of hippuric acid in the urine. This acid is the product of benzoic acid detoxification in the liver of. In the human body benzoic acid is formed from the following amino acid:
a. Aspartate
b. Malate
c. Succinate
d. Lactate
e. Phenylalanine

81. A group of alpinists climbing to the top had their blood tested. The test revealed erythrocytosis and an increase in hemoglobin rate.What type of hypoxia caused the stimulation of erythropoiesis in the bone marrow?
a. Circulatory
b. Tissue
c. Combined
d. Hemic
e. Hypoxic

82. Quite often, the soil may contain a number of pathogenic microorganisms. The causative agents of the following disease may exist in the soil for a long time:
a. Diphtheria
b. Pertussis
c. Dysentery
d. Anthrax
e. Viral hepatitis

83. Pathogenic microorganisms are characterized by presence of aggression enzymes that determine their virulence. Select an aggression enzyme:
a. Transferase
b. Carbohydrase
c. Hyaluronidase
d. Oxidase

e. Lyase

84. By heating β-hydroxy acids the following substance is formed:
a. Unsaturated carboxylic acids
b. Lactides
c. Saturated monocarboxylic acids
d. Dicarboxylic acid
e. Lactones

85. The pH of 0,001 M of hydrochloric acid solution is:
a. 3
b. 10
c. 5
d. 7
e. 0

86. Which of the listed biologically active compounds inhibits the secretion of pancreatic juice?
a. Acetylcholine
b. Gastrin
c. Secretin
d. Atropine
e. Insulin

87. What type of tautomerism is typical for the given compound?
a. Nitro-aci-nitro tautomerism
b. Cyclo-oxo tautomerism
c. Keto-enol tautomerism
d. Amine-imine tautomerism
e. Carbonyl-enol tautomerism

88. The molar mass of calcium hydroxide equivalent (M(Ca(OH)2) = 74 g/mol) is:
a. 32 g/mol
b. 19 g/mol
c. 37 g/mol
d. 74 g/mol
e. 148 g/mol

89. Bacteriological inspection of disinfection quality at a pharmacy revealed a microorganism in an utility room (in the sink). The microorganism has the following properties: mobile nonspore-forming gram-negative bacteria that form capsular substance, grow well on ordinary nutrient media, secrete the blue-green pigment. This microorganism is most likely to be of the following genus:
a. Vibrio
b. Pseudomonas
c. Clostridium
d. Proteus
e. Shigella

90. Microbiological analysis of medicinal raw materials revealed capsular bacteria. What stain method was used to detect the capsules?
a. Ozheshko’s
b. Gin’s
c. Neisser’s
d. Ziehl-Neelsen’s
e. Gram’s

91. The analyzed plant has hollow ribbed stems, compound umbel inflorescence, schizocarpic fruit (cremocarp) and is rich in essential oils, which is a characteristic of:
a. Fabaceae
b. Brassisaceae

c. Asteraceae
d. Apiaceae
e. Ericaceae

92. Specify the colour of phenolphthalein in the sodium sulfide solution:
a. Colourless
b. Yellow
c. Green
d. Crimson
e. Blue

93. In pharmaceutical technology an important part is played by pressure, temperature, concentration. The reaction yield can be increased by lowering the temperature of the following process:
a. Endothermic
b. Isobaric
c. Adiabatic
d. Exothermic
e. Isochoric

94. To identify a drug by thin-layer chromatography the following parameter is used:
a. I, A
b. Kp
c. n
d. E, mV
e. Rf

95. The intracellular metabolism of glycerol starts with its activation. What compound is formed in the first reaction of its conversion?
a. Lactate
b. Pyruvate
c. Alpha-glycerolophosphate
d. Choline
e. Acetyl coenzyme A

96. When ammonia enters into reaction with acids, this results in formation of ammonium salts. Which properties of ammonia characterize this process?
a. Ability to accept the hydrogen ions
b. Acidic properties
c. Ability to hydrolyze
d. Oxidative properties
e. Reductive properties

97. A patient had been diagnosed with right lung cancer and administered surgical treatment. After right-sided pulmonectomy the patient presented with evident dyspnea. What form of respiratory failure has developed in this patient?
a. Central
b. Pulmonary obstructive
c. Thoracodiaphragmal
d. Pulmonary restrictive
e. Peripheral

98. What wave of ECG characterizes the spread of excitation throughout the heart atria?
a. T
b. S
c. R
d. Q
e. P

99. Cardiac tones are the outer acoustic manifestations of heart functioning. What is the cause of the II tone?

a. Closure of the semilunar valves
b. Vibration of the ventricle walls
c. Chest movements
d. Vibration of the atrium walls
e. Closure of the cuspid valves

100. In accordance with the requirements of the pharmacopoeia, the non-sterile medicinal preparations may include microorganisms. What micro-organisms MUST NOT be present in them?

a. Enterobacteria
b. Micrococci
c. Sarcinae
d. Mold fungi
e. Ascomycetes

101. While performing finger-nose test the examinee could not touch the tip of his nose with his fingertip having his eyes closed. What structure of the central nervous system is damaged?

a. Spinal cord
b. Thalamus
c. Quadrigeminal plate
d. Cortex
e. Cerebellum

102. A patient has obstruction of the common bile duct. Which of these substances is usually found in urine in such cases?

a. Bilirubin
b. Uric acid
c. Glucose
d. Creatinine
e. Ketone bodies

103. A continuous stay in the mountains causes an increase of blood oxygen capacity. What is the possible reason for this phenomenon?

a. Decrease in respiratory rate and depth
b. Development of gas acidosis
c. Increase of PO2 rate in the air
d. Increase of PCO2 rate in the air
e. Development of functional erythrocytosis

104. A student had to analyze an axial plant organ characterized by radial symmetry, unlimited growth, positive geotropism. It provided nutrition, vegetative propagation, anchorage of plant in the soil. This organ was identified as . . .

a. Seed
b. Root
c. Leaf
d. Stem
e. Rhizome

105. A patient presents with fever, chill and cough. From his sputum the ovoid Gram-negative bipolar-stained bacilli with a delicate capsule were isolated. What is the most likely diagnosis?

a. Plague
b. Leptospirosis
c. Toxoplasmosis
d. Brucellosis
e. Tuberculosis

106. Choose a name that corresponds to the formula: CH3-C≡N:

a. Acetoxime
b. Ethyl isocyanide
c. Acetamide
d. Acetic anhydryde
e. Acetic acid nitrile

107. What data is required to determine the activation energy?
a. Thermal energy of the reaction
b. Internal energy of the system
c. Reaction order
d. Constants of reaction rate at two temperatures
e. Energy change of the system

108. A patient with systemic lupus erythematosus has developed a diffuse renal affection accompanied by proteinuria, hypoproteinemia, massive edema. What is the mechanism of proteinuria development in this case?
a. Inflammation of renal tubules
b. Blood protein increase
c. Affection of urinary tracts
d. Autoimmune affection of glomeruli
e. Ischemic affection of tubules

109. What reactions are used in the methods of permanganatometry, dichromatometry, iodometry?
a. Complexation
b. Precipitation
c. Oxidation-reduction
d. Neutralization
e. Hydrolysis

110. In order to bind hydrogen ions during the identification of potassium ions with tartaric acid the following solution is used:
a. Sulfuric acid
b. Hydrochloric acid
c. Sodium hydroxide
d. Ammonia
e. Sodium acetate

111. According to the Paneth-Fajans rule, the ion preferably adsorbed from a solution on the surface of a solid crystalline adsorbent is the ion, which:
a. Forms an easily soluble compound with one of the lattice ions
b. Forms a sparingly soluble compound with one of the lattice ions
c. Is not included in the crystal lattice of the adsorbent
d. Does not form a sparingly soluble compound with one of the lattice ions
e. Is included in the crystal lattice of the adsorbent

112. Some medications are produced by hydrolysis of corresponding neutral salts. From the salts listed below, select the one that WILL NOT succumb to hydrolysis:
a. Na_2SO_3
b. Na_2SO_4
c. $AlCl_3$
d. $NaHCO_3$
e. $Bi(NO_3)_3$

113. Which of the following reactions is required in order to obtain an azo dye out of an aromatic amine?
a. Reduction and diazotization
b. Salt formation and nitration
c. Alkylation and nitrosation

d. Diazotization and azo compound
e. Diazotization and interaction with potassium cyanide

114. A solution containing calcium and magnesium cations is titrated with Trilon B solution. Complexometric titration of these cations requires the following medium:
a. Neutral medium
b. Formate buffer solution
c. Ammonium buffer solution
d. Acidic solution
e. Acetate buffer solution

115. What is the mechanism of bromination of toluene aromatic nucleus?
a. SR
b. AE
c. SE
d. SN
e. AN

116. This scheme of nitroalkane synthesis is called the reaction of:
a. Chichibabin
b. Konovalov
c. Kucherov
d. Zinin
e. Tishchenko

117. A hospital admitted a patient with arterial hypertension induced by renal artery stenosis, complaints of persistent nausea and headache. The main element in the pathogenesis of hypertension is the activation of the following system:
a. Sympathoadrenal
b. Parasympathetic
c. Hypothalamic-pituitary
d. Kallikrein-kinin
e. Renin-angiotensin

118. Nitrating mixture is a mixture of concentrated acids:
a. HCl + H_2SO_4
b. H_3PO_4+ H_2SO_4
c. HNO_3 + H_2SO_4
d. HNO_3 + HCl
e. H_3PO_4 + HCl

119. Bacterioscopic examination of chancre material revealed some mobile, long, convoluted microorganisms with 8-12 regular coils. These features are typical for:
a. Treponema
b. Leptospira
c. Campylobacter
d. Vibrios
e. Borrellia

120. Before a surgical operation, a surgeon treated his hands with an alcoholcontaining solution.Which group of drugs does this solution relate to?
a. Surface-active substances
b. Antiseptics
c. Sterilizing solutions
d. Disinfectants
e. Detergents

121. In order to establish the possible contamination of a medication with fungi, a nutrient medium was inoculated, which resulted in growth of large cream-like colonies. What nutrient medium was

used in this case?
a. Lowenstein-Jensen
b. Loeffler
c. Finn-2
d. Sabouraud
e. Roux

122. Aniline can be converted into watersoluble salt by treatment with a solution of:
a. Ethanol
b. Dimethylamine
c. Sodium hydroxide
d. Sodium sulfate
e. Hydrochloric acid

123. As a rule, the maximum oxidation number of an element is:
a. Subgroup number in the periodic system
b. Row number
c. -
d. Group number in the periodic system
e. Period number

124. It is known that some chemical compounds uncouple the tissue respiration and oxidative phosphorylation. Name one of these compounds:
a. Lactic acid
b. Acetyl-CoA
c. Carbon monoxide
d. Antimycin A
e. 2,4-dinitrophenol

125. A warmly dressed child has spent a considerably long time out of doors. This resulted in body temperature elevation and general weakness development. What form of thermoregulation disorder is observed in this case?
a. Heat shock
b. Centrogenous hyperthermia
c. Endogenous hyperthermia
d. Fever
e. Exogenous hyperthermia

126. A patient with pneumosclerosis has blood pH at the rate of 7,34. Analysis of gas formula of blood showed hypercapnia. Urine analysis revealed an acidity increase. What form of acid-base disbalance is the case?
a. Non-gaseous acidosis
b. Gaseous acidosis
c. Gaseous alkalosis
d. Secretory alkalosis
e. Non-gaseous alkalosis

127. The study of the main root ontogenesis shows that it has developed from:
a. Pericycle
b. Apical meristem
c. Radicle
d. Lateral meristem
e. Intercalary meristem

128. The end product of starch hydrolysis is:
a. Maltose
b. D-galactose
c. D-fructose

d. Saccharose
e. D-glucose

129. What reagent can help to distinguish between starch and glucose?
a. I2
b. KMnO4
c. FeCl3
d. K2Cr2O7
e. Br2

130. Which of the following solutions with the same molar concentration has the maximum osmotic pressure?
a. Glucose
b. Magnesium sulfate
c. Potassium iodide
d. Aluminum nitrate
e. Sodium chloride

131. Pharmacopoeia test reaction for determination of benzoate ions is the interaction with the following solution:
a. Iron (III) chloride
b. Resorcinol
c. Diphenylamine
d. Acetic anhydride
e. Potassium chloride

132. If the amount of high-molecular substance added to the sol is very small, it may not increase but decrease its stability. This phenomenon is called:
a. Sol habituation
b. Sensibilization
c. Mutual coagulation
d. Solubilization
e. Colloidal protection

133. In order to increase the inhibitory processes in the CNS the pharmacological agents are used that cause the following process on the postsynaptic membranes:
a. Activation of calcium channels
b. Hyperpolarization
c. Afterdepolarization
d. Depolarization
e. Activation of sodium channels

134. A 70-year-old patient has been found to have atherosclerosis of heart and brain vessels. Examination revealed the changes in the lipid profile. Pathogenesis of atherosclerosis is greatly influenced by an increase in the following lipoproteins rate:
a. High-density lipoprotein
b. Chylomicrons
c. Very-low-density lipoproteins
d. Intermediate-density lipoproteins
e. Low-density lipoprotein

135. Calendula officinalis which a representative of the aster family is characterized by the following inflorescence type:
a. Flowerhead
b. Catkin
c. Cyme
d. Glome
e. Umbel

136. Which medicinal plant of the Asteraceae family has only disk flowers in the flowerhead?

a. Three-part beggarticks (Bidens tripartita)

b. Echinacea purpurea

c. Common yarrow (Achillea millefolium)

d. Cornflower (Centaurea cyanus)

e. Dandelion (Taraxacum officinale)

137. After eating strawberries a child presented with itchy red spots on the skin (hives). According to the classification of Coombs and Jell this reaction relates to the following type of allergic reactions:

a. Reagin (anaphylactic)

b. Immunocomplex

c. Stimulating

d. Cell-mediated

e. Cytotoxic

138. When determining the changes in membrane permeability during an action potential it was established that during the depolarization phase the following movement predominates:

a. Movement of Cl- into the cell

b. Movement of Na+ into the cell

c. Movement of K+ into the cell

d. Movement of Na+ out of the cell

e. Movement of K+ out of the cell

139. Spore and pollen analysis revealed in the pollen some tetrahedral spores with a semi-circular base and a reticular surface, which may belong to:

a. Pinophyta

b. Lycopodiophyta

c. Bryophyta

d. Equisetiphyta

e. Polypodiophyta

140. In the practice of harvesting herbal rawmaterial of Asteraceae family the term "flowers"means both individual flowers and inflorescences. However, the notion of "flowers"is botanically correct only for:

a. Arnica montana

b. Gnaphalium uliginosum

c. Centaurea cyanus

d. Echinops ritro

e. Bidens tripartita

141. What working solutions (titrants) are used in the method of precipitation titration - Folgard method?

a. $AgNO_3$ and NH_4SCN

b. $Na_2S_2O_3$ and $K(I_3)$

c. $HClO_4$and KOH

d. $KMnO_4$and $KBrO_3$

e. $H_2SO_4$and NaOH

142. In which of these reactions hydrogen acts as an oxidizing agent?

a. $2Na + H_2 > 2NaH$

b. $CuO + H_2 > H_2O + Cu$

c. $F_2 + H_2 > 2HF$

d. $N_2 + 3H_2 > 2NH_3$

e. $Cl_2 + H_2 > 2HCl$

143. A perennial herbaceous plant has ascending quadrangular stem and oppositely arranged leaves. The flowers with bilabiate corolla are zygomorphic, bisexual, arranged in whorls in the leaf axils. The fruit type is coenobium. The described medicinal plant relates to the following botanic family:

a. Asteraceae
b. Brassicaceae
c. Rosaceae
d. Lamiaceae
e. Poaceae

144. Dysbiosis can be treated with drugs that contain living representatives of normal microflora as well as their metabolic products. Select the microorganisms that are used for the production of such drugs:
a. Providencia
b. Yersinia
c. Staphylococcus aureus
d. Proteus
e. Bifidus bacteria

145. The primary structure of nucleic acids is a polynucleotide chain which has a certain composition and order of the nucleotides. What bonds stabilize this structure?
a. Glycosidic
b. Peptide
c. 3’,5’-phosphodiester
d. Disulfide
e. Amide

146. While determining the type and characteristics of conducting bundles of axial organs one should take into account the positional relation between phloem and xylem and...?
a. Pericycle
b. Phellogen
c. Procambium
d. Collenchyme
e. Cambium

147. Growth of some cancer cells is caused by a certain growth factor. Treatment of leukemia involves applying an enzyme that destroys this essential factor. Specify this enzyme:
a. Aspartate aminotransferase
b. Asparaginase
c. Succinate dehydrogenase
d. Glutaminase
e. Citrate synthetase

148. Medicinal plants infected by microorganisms cannot be used in the pharmaceutical industry. Invasive properties of phytopathogenic microorganisms are due to the following enzymes:
a. Hydrolytic
b. Transferase
c. Lyase
d. Oxidoreductase
e. Isomerase

149. The medicinal plants growing on a plantations were found to have mosaic patterns on leaves. What microorganisms caused this affection?
a. Rickettsiae
b. Phytopathogenic viruses
c. Phytopathogenic fungi
d. Phytopathogenic bacteria
e. Protozoa

150. Bacteria eventually become resistant to antibacterial agents. Resistance of gram-positive bacteria to penicillin antibiotics is caused by:
a. Permeability of the cell wall

b. Active transport of antibiotic
c. Protein synthesis
d. Beta-lactamase production
e. Active synthesis of peptidoglycan

151. A 28-year-old male got a burn that caused an increase in spontaneous secretion of gastric juice. It is associated with secretion of the following substance:
a. Secretin
b. Cholecystokinin-Pancreozymin
c. Serotonin
d. Histamine
e. Gastric inhibitory peptide

152. Blood pressure is regulated by a number of biologically active compounds. What peptides that enter the bloodstream can affect the vascular tone?
a. Iodothyronines
b. Endorphins
c. Leukotrienes
d. Enkephalins
e. Kinins

153. Mycothallus of the fungus under study consists of a stipe, pileus, lamellar hymenophore. This fungus belongs in the class:
a. Oomycetes
b. Basidiomycetes
c. Zygomycetes
d. Ascomycetes
e. Deuteromycetes

154. A laboratory received a sample of water used in drug production for sanitary and virological analysis.What group of viruses will indicate faecal contamination of water and thus the need for its additional purification?
a. Retroviridae
b. Flaviviridae
c. Herpesviridae
d. Orthomyxoviridae
e. Picornaviridae

155. Specify the indicator of the protective properties of high-molecular compounds of body that promote the keeping of calcium, phosphate and carbonate in blood plasma:
a. Volume of sol coagulated by 1 mol of the electrolyte substance
b. Protective value
c. Critical micelle concentration
d. Coagulation threshold
e. Hydrophilic-lipophilic balance

156. After an insulin injection a 45-yearold woman with a long history of diabetes mellitus has developed weakness, paleness, palpitation, anxiety, double vision, numbness of lips and the tip of tongue. Blood glucose is at the rate of 2,5 mmol/l. What complication has developed in the patient?
a. Uremic coma
b. Hypoglycemic coma
c. Hyperglycemic coma
d. Hyperosmolar coma
e. Hyperketonemic coma

157. Morphological analysis of poplar inflorescence showed that it is a simple monopodial inflorescence: main axis is drooping, the flowers are sessile, unisexual. Specify the type of inflorescence:

a. Panicle
b. Catkin
c. Capitulum
d. Head
e. Cyme

158. Specify the compound with the most pronounced basic properties:
a. -
b. Bi(OH)3
c. As(OH)3
d. Sb(OH)3
e. H3PO3

159. What is the equivalent of Al(OH)3 in the reaction Al(OH)3 + 2HCl = Al(OH)Cl2 + 2H2O?
a. 3 mol
b. 1/2 mol
c. 1 mol
d. 1/3 mol
e. 2 mol

160. Food rich in carbohydrates at first increases the blood glucose and then decreases its rate due to the insulin action. What process is activated by this hormone?
a. Gluconeogenesis
b. Breakdown of proteins
c. Breakdown of lipids
d. Synthesis of glycogen
e. Breakdown of glycogen

161. A patient has developed megaloblastic anemia on a background of alcoholic cirrhosis. The main cause of anemia in this patient is the following vitamin deficiency:
a. Pantothenic acid
b. Folic acid
c. Biotin
d. Lipoic acid
e. Thiamin

162. Inflorescence of greater plantain grows out at apex, the main axis is long, and flowers are sessile. This type of inflorescence is called:
a. Capitulum
b. Thyrsus
c. Panicle
d. Spadix
e. Spike

163. In order to identify the cations of zinc (II) an analytical chemist used the reagent solution of hexacyanoferrate (II) potassium (Pharmacopeia reaction). What colour precipitate is formed in this reaction?
a. White
b. Black
c. Red
d. Green
e. Yellow

164. A patient was found to have an increased blood serum LDH-1 activity. In which organ is the pathological process localized?
a. Kidneys
b. Liver
c. Heart

d. Stomach
e. Muscles

165. Diaphoretic herbal tea includes dichasial cymes with light-yellow, oblong, wing-like, squamelliferous perianth. The flowers are fragrant, yellowish. These inflorescences belong to:
a. Padus avium
b. Tilia cordata
c. Robinia pseudoacacia
d. Viburnum opulus
e. Mentha piperita

166. A patient with alcoholic cirrhosis complains of general weakness, dyspnea. He has been found to have decreased blood pressure, ascites, enlargement of superficial veins of the anterior abdominal wall, esophageal varices, splenomegaly. What hemodynamic disorder is observed in the patient?
a. Collapse
b. Portal hypertension
c. Right ventricular failure
d. Left ventricular failure
e. Heart failure

167. A patient with tuberculosis has been prescribed some anti-TB preparations. Which of the following chemotherapeutic drugs has an effect on the tuberculosis pathogen?
a. Methisazonum
b. Furacilinum
c. Ftivazide
d. Sulfadimezinum
e. Phthalylsulfathiazole

168. What segment of a nephron contains liquid with a maximum concentration of glucose under normal conditions?
a. Inner medullary collecting duct
b. Poximal tubules
c. Inner medullary portion of thin descending limb of loop of Henle
d. Medullary thick ascending limb of loop of Henle
e. Distal convoluted tubule

169. Laboratory analysis revealed protein in the urine of a young man. In what case a healthy person may present a slight proteinuria?
a. After overeating
b. After exercise
c. During sleep
d. In the resting state
e. In the state of psychoemotional excitation

170. A male patient was found to have hypovitaminosis PP. What amino acid taken with food may partially compensate the vitamin PP deficiency?
a. Tryptophan
b. Valine
c. Methionine
d. Arginine
e. Phenylalanine

171. Emulsions are classified according to the volume concentration of dispersed phase. An emulsion with the concentration at the rate of 0,1-74,0% vol. relates to the following group of emulsions:
a. Direct
b. Reversible
c. Diluted
d. Highly concentrated

e. Concentrated

172. Choose a reaction, in which a basic salt is formed:
a. 2NaOH + H2SO4
b. Fe(OH)3 + 3KCl
c. Fe(OH)3 + 2HCl
d. KOH + H2SO4
e. NaOH + HCl

173. Ammonia solution has been added to the solution under examination. A black precipitate fell out. This indicates the presence of the following cations in the solution:
a. Copper (II)
b. Iron (II)
c. Silver (I)
d. Mercury (I)
e. Iron (III)

174. The causative agents of intestinal infections can grow at refrigerator temperatures, which may cause infection in people. What type of temperature optimum do these microorganisms relate to?
a. Mesophilic
b. Anthropophilic
c. Necrophilic
d. Psychrophilic
e. Thermophilic

175. What type of conducting bundles is characteristic of all root zones of oneseeded plants?
a. Bilateral
b. Collateral
c. Central phloem
d. Central xylem
e. Radical

176. A man who had been struck in the epigastric region had a heart arrest. What caused such changes in the cardiac activity?
a. Histamine release
b. Increased vagal tonus
c. Increased sympathetic tonus
d. Adrenaline release
e. Angiotensin II release

177. A 45-year-old patient with a gastric ulcer needs the reduction of HCl secretion. Which drug provides this effect due to inhibition of the proton pump?
a. Omeprazole
b. Quamatel
c. Proglumide
d. Benzohexonium
e. Atropine

178. When chyme enters the duodenum, it stimulates the secretion of gastrointestinal hormones. Which hormone is responsible for release of enzymes being included in digestive juices?
a. Somatostatin
b. Calcitonin
c. Secretin
d. Glucagon
e. Cholecystokinin-pancreozymin

179. Loop of Henle is involved in the mechanism of urine formation. What process takes place in its descending portion?
a. Reabsorption of water

b. Reabsorption of Na+
c. Reabsorption of Ca2+
d. Reabsorption of Cl-
e. Reabsorption of water and electrolytes

180. Alkaptonuria is characterized by an excessive urinary excretion of homogentisic acid. Development of this disease is associated with disorder of the following amino acid metabolism:
a. Alanine
b. Tryptophan
c. Tyrosine
d. Methionine
e. Asparagine

181. Antidepressants can increase the concentartion of catecholamines in the synaptic cleft. What is the mechanism of action of these drugs?
a. Inhibition of monoamine oxidase
b. Inhibition of xanthine oxidase
c. Inhibition of acetylcholinesterase
d. Activation of acetylcholinesterase
e. Activation of monoamine oxidase

182. A patient was taken to a hospital with acute food poisoning caused by homemade canned mushrooms. The product analysis revealed some microorganisms that develop only in the absence of oxygen. What microorganisms caused the poisoning?
a. Facultative anaerobes
b. Obligate aerobes
c. Capnophiles
d. Obligate anaerobes
e. Microaerophiles

183. During a survey of the sanitary state of an environment object perfringens titre was determined. What object was studied?
a. Water from an open water reservoir
b. Outdoor air
c. Soil
d. Tap water
e. Indoor pharmacy air

184. According to the Rayleigh equation, the intensity of scattered light is inversely proportional to the wavelength of:
a. Incident light (second power)
b. Incident light (third power)
c. Incident light
d. Incident light (fourth power)
e. Incident light (fifth power)

185. Quantitative analysis of zinc salts is performed by method of trilonometry. What indicator is used for this purpose?
a. Potassium dichromate
b. Thymol blue
c. Phenolphtalein
d. Methyl black
e. Eriohrome black-T

186. Clinical practice involves measurement of ESR. What are the components of blood plasma that mainly determine the ESR value?
a. Bilirubin
b. Urea

c. Globulins
d. Inorganic ions
e. Phospholipids

187. The patient uses a daily basis for several raw eggs, which contain antivitamin biotin - avidin. Violations of any phase of lipid metabolism might arise?
a. Lipid transport in blood
b. Fatty acid biosynthesis
c. Lipid absorption
d. Cholesterol biosynthesis
e. Glycerol oxidation

188. Aqueous solutions of CuSO4are used in ophthalmic and urological practice as an antiseptic, astringent and cauterant agent. What is the oxidation number of cuprum in this compound?
a. +3
b. -1
c. +1
d. 0
e. +2

189. Astragalus dasyanthus has sessile flowers gathered into inflorescences with a short thick axis. This inflorescence is called:
a. Cyme
b. Spike
c. Head
d. Capitulum
e. Truss

190. The technology of drug production widely uses the phenomena of absorption and ion exchange. Which of the ions will be selectively adsorbed on the surface of a silver chloride crystal from an aqueous solution?
a. Ag+
b. NO3?
c. OH-
d. H+
e. Cu2+

191. A common species of the Pinaceae family is a tall, evergreen, shade-enduring tree. The needles are solid, prickly, quadrangular in cross-section, spirally arranged. This tree is:
a. Ephedra equisetina
b. Picea abies
c. Pinus sylvestris
d. Larix sibirica
e. Juniperus communis

192. Early pregnancy can be detected by using the appropriate test. A positive pregnancy test is based on the presence of the following hormone in urine:
a. Chorionic gonadotropin
b. Oestradiol
c. Oxytocin
d. Prolactin
e. Progesterone

193. A patient has developed an attack of bronchial asthma: he has laboured respiration with the frequency of 24-26/min., inspirations take turns with prolonged expirations involving participation of expiratory muscles. What form of respiratory failure has developed in the patient?
a. Inspiratory dyspnea
b. Apneustic respiration

c. Cheyne-Stokes
d. Biot’s
e. Expiratory dyspnea

194. A58-year-old male patient was found to have a peripheral circulation disorder with a restricted arterial inflow, paleness of the respective region, drop of partial oxygen pressure in it. This disorder is called:
a. Thrombosis
b. Arterial hyperemia
c. Ischemia
d. Venostasis
e. Reperfusion syndrome

195. To prepare 600 g of 10% solution of potassium hydroxide the following amount of potassium must be taken:
a. 12 g
b. 60 g
c. 6 g
d. 0,6 g
e. 10 g

196. Half-life (half-reaction) is inversely proportional to the initial concentration for the reactions of:
a. First order
b. Third order
c. Zeroth order
d. Second order
e. Fraction order

197. A male received a radiation dose of 30 Gy. He presents with necrotic angina, disorders of the gastrointestinal tract. Blood tests revealed anemia, leukopenia and thrombocytopenia. What period of acute radiation sickness is observed in the patient?
a. End of disease
b. -
c. Primary reactions
d. Imaginary wellbeing
e. Height of disease

198. Examination of the leaf epidermis revealed cells containing cystoliths. Presence of cystoliths is typical for plants of the following family:
a. Fabaceae
b. Brassicaceae
c. Urticaceae
d. Solanaceae
e. Papaveraceae

199. Seroprophylaxis and serotherapy of infectious diseases involves using immune sera.What type of immunity is thus acquired?
a. Passively acquired artificial immunity
b. Actively acquired natural immunity
c. -
d. Passively acquired natural immunity
e. Actively acquired artificial immunity

200. Caffeine inhibits phosphodiesterase which converts cAMP to AMP. The most typical feature of caffeine intoxication is the reduced intensity of:
a. Lipolysis
b. Glycogen synthesis
c. Pentose phosphate pathway

d. Protein phosphorylation
e. Glycolysis

201. An excess of concentrated ammonium hydroxide is a group reagent for the cations of the VI analytical group(acid-base classification), namely Co2+, Ni2+, Cd2+, Cu2+, Hg2+. As a result of this reaction the following substances are formed:
a. Stained water-insoluble compounds
b. Hydroxides of acid-soluble cations
c. Water-soluble ammonia complexes
d. Hydroxides of alkali-soluble cations
e. Hydroxides of the cations insoluble in the excess of ammonium hydroxide

202. Which of the listed reactions demonstrates the basic properties of pyridine?
a.
b.
c.
d.
e.

203. A patient with stenocardia has been administered acetylsalicylic acid for:
a. Increase in blood fibrinolytic activity
b. Antiplatelet effect
c. Aggregate effect
d. Inhibition of blood fibrinolytic activity
e. Anti-inflammatory effect

204. On the 4th day of treatment with indomethacin a male 55-year-old patient developed gastric bleeding due to the ulceration of the gastric mucosa. Ulcerogenic effect of the drug is associated with a decrease in the activity of the following enzyme:
a. Prostacyclin synthase
b. Cyclooxygenase-1
c. Lipoxygenase
d. Cyclooxygenase-2
e. Thromboxane synthetase

205. A patient with hypertensive crisis has been given an intravenous injection of clonidine. What mechanism underlies the antihypertensive effect of clonidine?
a. Stimulation of presynaptic central α2-adrenoceptors
b. Blockade of β-adrenoceptors
c. Direct myotropic effect on blood vessels
d. Blockade of N-cholinergic receptors
e. Blockade of peripheral α1-adrenoceptors

206. A patient with ischemic heart disease has been administered inosine which is an intermediate metabolite in the synthesis of:
a. Ketone bodies
b. Purine nucleotides
c. Lipoproteins
d. Metalloproteins
e. Glycoproteins

207. A patient with hypertensive crisis should be administered a diuretic as a part of complex therapy. What drug should be given the patient?
a. Amiloride
b. Furosemide
c. Spironolactone
d. Diacarb
e. Triamterene

208. Rates of chemical reactions of the same order are compared by:
a. Change in the reactants concentration
b. Change in the concentration of the reaction products
c. Chemical reaction rate
d. Endpoint of a reaction
e. Constant of chemical reaction rate

209. Consult a patient on which antihistamine drug DOES NOT have sedative and hypnotic effect:
a. Promethazine
b. Diphenhydramine
c. Loradatine
d. Suprastinum
e. Tavegil (Clemastine)

210. A patient with hypertension has been prescribed a drug that blocks angiotensin receptors. Specify this drug:
a. Prazosin
b. Nifedipine
c. Losartan
d. Captopril
e. Apressin

211. A patient with gastric ulcer has been administered omeprazole. What is the mechanism of its action?
a. Stimulation of mucus production
b. Inhibition of H+ K+-ATPase
c. M-cholinergic receptor blockade
d. Blockade of histamine H2-receptors
e. Neutralization of HCl

212. Which of these formulas corresponds with acetoacetic acid?
a.
b.
c.
d.
e.

213. After taking phenacetin a patient developed acute sore throat, fever. Examination enabled doctors to make a diagnosis of necrotic angina and agranulocytosis. Agranulocytosis can be characterized by a decrease in the amount of the following WBCs:
a. Eosinophils
b. Lymphocytes
c. Monocytes
d. Neutrophils
e. Basophils

214. Apatient with a heart rhythm disorder has been given lidocaine. Apart from the local anesthetic effect, this drug has the following pharmacological effect:
a. Hypnotic
b. Antidepressant
c. Nootropic
d. Antiarrhythmic
e. Antipyretic

215. A patient with chronic constipation has been prescribed bisacodyl. After 3 weeks of treatment, the patient noticed a reduction of laxative effect. This is caused by the development of the following sideeffect:
a. Habituation

b. Sensibilization
c. Dysbacteriosis
d. Cumulation
e. Dependence

216. It is not advisable to use antacids and iron supplements at the same time for the following reason:
a. Accelerated elimination of iron
b. Malabsorption of iron
c. Impaired deposition of iron in the body
d. Increased binding to plasma proteins
e. Increased intoxication with iron

217. A patient with acute heart failure and cardiac glycosides intolerance was given an injection of dobutamine. What is the mechanism of its action?
a. Stimulation of α1-adrenoceptors
b. Inhibition of phosphodiesterase activity
c. Stimulation of M-cholinergic receptors
d. Stimulation of β1-adrenoceptors
e. Blockade of K+ -, Na+ - ATPase

218. A female patient asked a pharmacist to recommend her a drug for headache with antiplatelet effect. Specify this drug:
a. Acetylsalicylic acid
b. Promedol
c. Fentanyl
d. Tramadol
e. Codeine phosphate

219. A plant under examination has papilionaceous flowers. This plant belongs to the following family:
a. Fabaceae
b. Ranunculaceae
c. Asteraceae
d. Lamiaceae
e. Scrofulariaceae

220. Microscopic analysis of a root revealed the following features: primary structure, endodermal cells with horseshoe-shaped areas, radial fascicle of the central cylinder, more than six xylem rays. Such root structure is typical for the following plants:
a. Angiosperms, dicotyledons
b. Gymnosperms, gnetalians
c. Pteridosperms
d. Angiosperms, monocotyledons
e. Gymnosperms, conifers

221. Chronic pancreatitis is accompanied by the decreased synthesis and secretion of trypsin. This impairs the hydrolysis and absorption of the following substances:
a. Polysaccharides
b. Lipids
c. Proteins
d. Nucleic acids
e. Disaccharides

222. Analysis of a plant revealed essentialoil glands with several layers of cells arranged in pairs. This allows for the possibility that the plant relates to the family:
a. Scrofulariaceae
b. Apiaceae
c. Lamiaceae

d. Asteraceae
e. Solanaceae

223. In an emergency situation a scuba diver has quickly risen from the depths to the surface, which is against the rule. He is unconscious, exhibits respiratory failure and cardiac activity disorder as a result of decompression sickness.What complication may develop in the scuba diver?
a. Thromboembolism
b. Gas embolism
c. Air embolism
d. Fat embolism
e. Cellular embolism

224. A patient has been hospitalized for chronic heart failure. Objectively: skin and mucous membranes are cyanotic, the patient has tachycardia, tachypnea. What type of hypoxia has developed in the patient?
a. Hemic
b. Anemic
c. Circulatory
d. Tissue
e. Hypoxic

225. What are the indications for the use of naloxone?
a. Intoxication with cardiac glycosides
b. Heavy metal intoxication
c. Acute intoxication with narcotic analgesics
d. Intoxication with ergot alkaloids
e. Atropine sulfate intoxication

226. Amino group of p-aminobenzoic acid is involved into reaction with the following reagent:
a. CH3COONa
b. KCN
c. NH4OH
d. NaOH
e. HCl

227. A patient with renal colic has been administered a spasmolytic from the group of M-cholinergic antagonists as a part of the complex therapy. Specify this drug:
a. Benzohexonium
b. Atropine
c. Galantamine
d. Proserin
e. Dithylinum

228. What drug is administered in case of uterine inertia?
a. Progesterone
b. No-spa
c. Oxytocin
d. Vikasolum
e. Fenoterol

229. A patient with myocardial infarction has been administered intravenously a direct anticoagulant, namely:
a. Vikasol
b. Neodicumarinum
c. Heparin
d. Thrombin
e. Calcium gluconate

230. What drug should be administered for individual prevention of malaria?

a. Biseptol (Co-Trimoxazolel)
b. Chingamin
c. Ampicillin
d. Rifampicin
e. Gentamicin

231. A sample section of an axial body shows a complex consisting of phellogen and its derivatives - cork and phelloderm. This tissue is called:
a. Epidermis
b. Periderm
c. Sclerenchyma
d. Colenchyma
e. Epiblema

232. A pharmacy dispenses glaucine hydrochloride to a patient with chronic bronchitis. The patient must be warned about the following typical side effect of the drug:
a. Blood pressure fall
b. Arrhythmia
c. Allergic skin rash
d. Rise of intraocular pressure
e. Excitation of the central nervous system

233. A solution contains cations of zinc and aluminium. Specify the reagent that makes it possible to detect cations of zinc in this solution:
a. Sodium hydroxide solution
b. Excess of 6M sodium hydroxide in presence of hydrogen peroxide
c. Sulfuric acid solution
d. Potassium hexacyanoferrate (II) solution
e. Cobalt nitrate Co(NO3)2

234. A medicament comprises sodium bicarbonate and sodium chloride. What method is used for quantitative determination of sodium bicarbonate?
a. Precipitation titration
b. Complexometric titration
c. Coulometric titration
d. Acid-base titration
e. Redox titration

235. Concentration of magnesium sulfate in a drug can be determined by complexometric titration. Select an indicator for fixing the end point of titration:
a. -
b. Chromogen black
c. Methyl orange
d. Phenolphtalein
e. Diphenylcarbazone

236. Select a pair of electrodes for potentiometric pH measurement of a solution:
a. Calomel and silver chloride
b. Mercury sulphate and silver chloride
c. Glass and antimonial
d. Glass and silver chloride
e. Quinhydrone and antimonial

237. The mass percentage of ascorbic acid can be determined by the cerimetric analysis in the presence of the following redox indicator:
a. Methylene red
b. Fluorescein
c. Methylene orange

d. Ferroin
e. Eosin

238. An injured person exhibits the following signs at the site of trauma: skin redness, throbbing small arteries, elevated local temperature, increased tissue turgor. What local blood circulation disorder are these presentations typical for?
a. Ischemia
b. Arterial hyperemia
c. Thrombosis
d. Venous hyperemia
e. Embolism

239. Microscopic examination of a perennial stem revealed the secondary integumentary tissue that was formed as a result of cell division of:
a. Pericycle
b. Protoderma
c. Procambium
d. Cambium
e. Phellogen

240. What synthetic drug of the hydrazide group is typically prescribed for pulmonary tuberculosis?
a. Rifampicin
b. Metronidazole
c. Doxycycline hydrochloride
d. Isoniazid
e. Acyclovir

241. A female student with a cold has been prescribed an antipyretic medication. Specify this drug:
a. Paracetamol
b. Oxytocin
c. Cyanocobalamin
d. Famotidine
e. Ascorbic acid

242. Specify the drug that constricts pupils and reduces intraocular pressure:
a. Fenofibrate
b. Atropine sulfate
c. Dithylinum
d. Pilocarpine hydrochloride
e. Nitrazepamum

243. A plant under study has stipules fused together and thus forming a tight tube - ochrea, that is a diagnostic feature of the following family:
a. Gramineae
b. Papaveraceae
c. Clusiaceae
d. Polygonaceae
e. Rosaceae

244. A 42-year-old female has foamypurulent vaginal discharges. The smear stained by Romanovsky-Giemsa’s method has been found to include flagellated bacteria. What is the most likely microorganism that has been found by the doctor?
a. Trihomonas vaginalis
b. Trypanosoma gambiense
c. Lamblia intestinalis
d. Trihomonas hominis
e. Leishmania donovani

245. A patient has been taking diclofenac sodium for a long time. The family physician withdrew this

drug and administered celecoxib. What disease was the reason for the drug substitution?
a. Urolithiasis
b. Bronchial asthma
c. Peptic ulcer
d. Arterial hypertension
e. Chronic hepatitis

246. The rate of a chemical reaction DOES NOT DEPEND on the concentration of the reactants. Specify the order of such reaction:
a. Second
b. First
c. Zeroth
d. Third
e. Fraction

247. A patient has been diagnosed with bronchial asthma. Specify a medicament that can be administered for asphyxiation:
a. Paracetamol
b. Diclofenac sodium
c. Salbutamol
d. Anapriline
e. Acetylcysteine

248. Sulfanilamides inhibit the growth and development of bacteria. The mechanism of their action is based on the impairment of the following acid synthesis:
a. Lipoic
b. Pantothenic
c. Pangamic
d. Folic
e. Nicotinic

249. Sulfanilamides are widely used as bacteriostatic agents. The mechanism of antimicrobial action of sulfanilamides is based on their structural similarity to:
a. Antibiotics
b. Para-aminobenzoic acid
c. Folic acid
d. Glutamic acid
e. Nucleic acid

250. Specify the standard solution for the iodometric determination of reducing agents (direct titration):
a. $KMnO_4$
b. $K_2Cr_2O_7$
c. KI
d. I_2
e. $Na_2S_2O_3$

251. The fourth group of cations includes the cations Al^{3+}, Sn^{2+}, $Sn(IV)$, $As(V)$, $As(III)$, Zn^{2+}, C^{3+}. The group reagent for the fourth group of cations is the solution of:
a. HCl
b. $H_2C_2O_4$
c. H_2SO_4, H_2O_2
d. NaOH, H_2O_2
e. NH_3, H_2O_2

252. In a qualitative analysis, when an excess of the group reagent (NH_3 solution) reacts with the cations of the sixth analytical group (Cu^{2+}, Co^{2+}, Ni^{2+}, Cd^{2+}, Hg^{2+}), the following compounds are formed:

a. Metal ammine complexes
b. Basic metal salts
c. Hydroxocomplexes of metals
d. Aqua complexes of metals
e. Metal hydroxides

253. Sodium fluoride is one of the components of the drugs used in the treatment of dental caries. NaF reacts with the following compound:
a. CH_3COOH
b. H_2SO_4
c. NaCl
d. CO_2
e. KI

254. The most common technology in pharmaceutical production is maintaining constant temperature and pressure. What is this process called?
a. Isochoric
b. Isothermal
c. Isochoric-isothermal
d. Isobaric
e. Isobaric-isothermal

255. Some medications are colloidal solutions. What size of the colloidal particles is typical for the colloidal dispersion?
a. > 10-3m
b. 10-7 - 10-9m
c. 10-10 - 10-11m
d. 10-5 - 10-7m
e. 10-5 - 10-3m

256. To maintain a certain level of pHmedium, the buffer solutions are used. Specify a composition of substances that DOES NOT EXHIBIT buffer properties:
a. $CH_3COOH + CH_3COONa$
b. $HCOOH + HCOONa$
c. $NaH_2PO_4 + Na_2HPO_4$
d. NaOH + NaCl
e. $NH_4Cl + NH_3 \cdot H_2O$

257. What non-narcotic centrally-acting antitussive drug can be used for dry cough?
a. Codeine
b. Ambroxol
c. Mucaltinum
d. Glaucine
e. Acetylcysteine

258. What analytical effect is observed after fixing the endpoint during the titration by Mohr method?
a. White precipitate
b. Yellow precipitate
c. Red colour of solution
d. Yellow colour of solution
e. Brick-red precipitate

259. What solution can be determined by photocolorimetric method by selfabsorbance?
a. Potassium chromate
b. Potassium sulphate
c. Potassium phosphate
d. Potassium nitrate
e. Potassium chloride

260. What substance in a solution can be determined in two ways - by the polarimetric or refractometric method?

a. Calcium gluconate
b. Magnesium sulfate
c. Sodium benzoate
d. Benzoic acid
e. Ascorbic acid

261. A patient with symptoms of chronic bronchitis has been administered acetylcysteine. What is the mechanism of its expectorant action?

a. Stimulation of respiratory center
b. Anesthesia of respiratory mucosa
c. Stimulation of adrenergic receptors
d. Inhibition of cough center
e. Depolymerization of sputum mucopolysaccharides

262. During the gastric secretion, proteolytic enzymes are secreted in form of zymogens.What enzyme is activated by hydrochloric acid?

a. Amylase
b. Trypsin
c. Pepsin
d. Lipase
e. Chymotrypsin

263. Specify the reaction product of purine reacting with sodium hydroxide:

a.
b.
c.
d.
e.

264. What class of reactions does this reaction relate to?

a. Reduction
b. Substitution
c. Addition
d. Oxidation
e. Rearrangement

265. The combined use of furosemide with aminoglycoside antibiotics causes:

a. Increased intraocular pressure
b. Hearing impairment
c. Cramps
d. Increased blood pressure
e. Hyperhidrosis

266. A child exhibits physical and mental retardation. Urine analysis revealed high concentration of orotic acid. This disease can be addressed by the constant use of:

a. Uridine
b. Guanine
c. Alanine
d. Glutamine
e. Adenine

267. To distinguish between phenol and salicylic acid, the following reagent is used:

a. Sodium hydroxide solution
b. Iron (III) chloride solution
c. Sodium bicarbonate solution
d. Sodium chloride solution

e. Bromine solution

268. Ethane is the product of the following reaction:
a. C_2H_5OH [H_2SO_4 concentr., t°] =>
b. -
c. Al_4C_3 [H_2O] =>
d. $CO + 2H_2$ [Fe, t°] =>
e. $CH_2=CH_2$ [H_2, cat] =>

269. What titrants are used for the titration in the non-aqueous medium?
a. Hydrochloric acid and potassium ethylate
b. Sulfuric acid and barium hydroxide
c. Perchloric acid and sodium ethylate
d. Nitric acid and sodium hydroxide
e. Perchloric acid and barium hydroxide

270. There are areas where humans or animals are exposed to the constant risk of contracting certain types of bacteria. What feature of these bacteria is responsible for their long viability in the soil?
a. Ability to multiply in the plant remains
b. Capsule formation
c. Spore formation
d. Thick cell wall
e. Plasmids

271. What reagents are used to separate the cations of the IV analytical group from the cations of the V and VI analytical groups in the analysis of their composition?
a. H_2SO_4
b. NH_4OH
c. Na_2S
d. NaOH and H_2O_2
e. Dithizone

272. Specify the standard substance for the standardization of 0,1 M of hydrochloric acid solution:
a. Oxalic acid
b. Ammonium hydroxide
c. Sodium carbonate
d. Sodium chloride
e. Zinc sulphate

273. A patient with a diagnosis of drug poisoning has been admitted to the resuscitation department. The patient is in grave condition. Respiration is rapid, superficial, with periods of apnea (Biot's respiration). What was the main cause of the development of periodic breathing in the patient?
a. Inhibition of the respiratory center function
b. Impaired function of the neuromuscular system
c. Pulmonary dysfunction
d. Diminished chest mobility
e. Impaired function of spinal cord motoneurons

274. Specify the number of electrons involved into formation of the isolated conjugated system in the pyrimidine molecule:
a. 6
b. 10
c. 8
d. 2
e. 4

275. In course of long-term treatment of an infectious patient with penicillin, the pathogen transformed into the L-form. What changes occur in the pathogen cell in case of L-transformation?
a. Absence of a cell wall

b. Absence of a capsule
c. Absence of inclusions
d. Absence of a spore
e. Absence of flagella

276. Dosage forms produced as coarse dispersion systems with the liquid dispersion medium and the solid phase are called:
a. Foam
b. Suspension
c. Aerosol
d. Emulsion
e. Powder

277. Ethanol C2H5OH, can be distinguished from glycerol CH2(OH)-CH2(OH)-CH2(OH) by the reaction with the following reagent:
a. Ag2O
b. Cu(OH)2
c. FeCl3
d. HBr
e. KMnO4

278. A patient was found to have a tumor of the pancreatic head, which is accompanied by the impaired patency of the common bile duct. Blood test will reveal an increase in the following substance level:
a. Adrenaline
b. Bilirubin
c. Hemoglobin
d. Urea
e. Insulin

279. On the 2nd day after developing acute inflammation of the knee joint, the patient exhibits the joint enlargement, swelling of the skin. At what stage of inflammation are these signs typically observed?
a. Proliferation
b. Alteration
c. Exudation
d. Regeneration
e. Sclerosis

280. Quite often, the soil may contain a number of pathogenic microorganisms. The causative agents of the following disease may stay viable in the soil for a long time:
a. Pertussis
b. Dysentery
c. Diphtheria
d. Viral hepatitis
e. Anthrax

281. As a result of an accident (snakebite) a male patient has the following blood values: Hb- 80 g/l, RBC- 3, 0·1012/l; WBC- 5, 5·109/l.What type of anemia is observed in this case?
a. Hemolytic
b. Posthemorrhagic
c. Iron-deficiency
d. Aplastic
e. Folic acid-deficiency

282. Emulsions of 0,1 - 74% dispersedphase volume relate to:
a. O/W type
b. Concentrated

c. Highly concentrated
d. Diluted
e. W/O type

283. Bacteriological inspection of disinfection quality at a pharmacy revealed a microorganism in an utility room (in the sink). The microorganism has the following properties: mobile nonspore-forming gram-negative bacteria that form capsular substance, grow well on ordinary nutrient media, secrete the blue-green pigment. This microorganism is most likely to be of the following genus:
a. Pseudomonas
b. Clostridium
c. Vibrio
d. Shigella
e. Proteus

284. At pH value 5,0 and isoelectric point 4,0, the protein will migrate toward the following electrode during electrophoresis:
a. Platinum
b. Anode
c. Calomel
d. Cathode
e. Silver chloride

285. The intracellular metabolism of glycerol starts with its activation. What compound is formed as a result of the first reaction of its conversion?
a. Acetyl coenzyme A
b. Alpha-glycerolophosphate
c. Lactate
d. Pyruvate
e. Choline

286. A 40-year-old patient has a history of bronchial asthma and bradyarrhythmia. In order to eliminate bronchospasm, the drugs of the following pharmacological group should be administered:
a. Muscle relaxants
b. M-anticholinergics
c. M-cholinergic agents
d. ?-adrenergic blocking agents
e. Anticholinesterase agents

287. Which representative of the Rosaseae family has spring bloom in form of white, fragrant flowers gathered in pendulous racemes at the ends of short shoots?
a. Padus rasemosa (P.avia)
b. Sorbus aucuparia
c. Crataegus sanquinea
d. Cerasus vulgaris
e. Potentilla erecta

288. A patient had been diagnosed with right lung cancer and administered surgical treatment. After right-sided pulmonectomy the patient developed evident dyspnea. What form of respiratory failure developed in this patient?
a. Thoracodiaphragmal
b. Pulmonary restrictive
c. Peripheral
d. Central
e. Pulmonary obstructive

289. A 22-year-old male was stung by bees, the affected region became hyperemic and edematous. What is the leading mechanism of edema development in this patient?
a. Reduced oncotic pressure of blood

b. Increased permeability of the capillaries
c. Increased oncotic pressure of tissue fluid
d. Decreased hydrostatic blood pressure in the capillaries
e. Impaired lymphatic efflux

290. A ground for separating lead (II) chloride from the other chlorides of the II analytical group (acid-base classification) is its different solubility in:
a. Hydrochloric acid
b. Ammonia solution
c. Sulfuric acid
d. Hot water
e. Alkalis

291. A student analyzes an axial plant organ characterized by radial symmetry, unlimited growth, positive geotropism. It provides nutrition, vegetative propagation, anchorage of plant in the soil. This organ should be identified as:
a. Stem
b. Rhizome
c. Seed
d. Root
e. Leaf

292. Cross section of a root conducting zone shows pericycle that gives rise to:
a. Adventitious roots
b. Trichomes
c. Lateral roots
d. Root fibrilla
e. Root cap

293. Select a name that corresponds with the formula: CH3-C≡N:
a. Acetoxime
b. Ethyl isocyanide
c. Acetamide
d. Acetic anhydryde
e. Acetic acid nitrile

294. What data is required to measure the activation energy?
a. Thermal energy of the reaction
b. Internal energy of the system
c. Reaction order
d. Constants of reaction rate at two temperatures
e. Energy change of the system

295. A patient with chronic renal failure exhibits azotemia, hypo- and isosthenuria. What is the main factor in the pathogenesis of these symptoms in the patient?
a. Reduction of existing nephrons mass
b. Reduction of tubular secretion
c. Decrease in glomerular filtration rate in each nephron
d. Disturbance of the permeability of the glomerular membrane
e. Increase in glomerular filtration rate

296. Which of the given compounds WILL NOT decolorize the bromine water?
a. CH3 - CH = CH2
b.
c. CH2 = CH2
d. CH ≡ CH
e. CH3 - CH3

297. Chemically, ethers are quite inert compounds. Ethers decompose even at a room temperature

under the effect of the following haloid acid:
a. HCl
b. HBr
c. HI
d. HF
e. HClO

298. Specify the number of existing stereoisomeric aldopentoses:
a. 4
b. 2
c. 8
d. 6
e. 16

299. This scheme of nitroalkane synthesis is called the reaction of:CH3-CH3 + HNO3 diluted =>[t,p]=> CH3-CH2-NO2 + H2O
a. Konovalov
b. Kucherov
c. Chichibabin
d. Tishchenko
e. Zinin

300. A hospital admitted a patient with arterial hypertension induced by renal artery stenosis. The patient complains of persistent nausea and headache. The main element in the pathogenesis of hypertension is the activation of the following system:
a. Kallikrein-kinin
b. Hypothalamic-pituitary
c. Renin-angiotensin
d. Sympathoadrenal
e. Parasympathetic

301. The products of the toluene nitration are mainly:
a.
b.
c.
d.
e.

302. Halogen atoms in an organic compound can be detected by means of:
a. Bayer’s test
b. Molisch’s test
c. Beilstein test
d. Lucas’ test
e. Iodoform test

303. Before a surgical operation, a surgeon treated his hands with an alcoholcontaining solution.Which group of drugs does this solution relate to?
a. Disinfectants
b. Detergents
c. Surface-active substances
d. Antiseptics
e. Sterilizing solutions

304. Aniline can be converted into the water-soluble salt through the treatment with a solution of:
a. Ethanol
b. Dimethylamine
c. Sodium hydroxide
d. Sodium sulfate

e. Hydrochloric acid

305. Select the correct product of the reaction:

a.

b.

c.

d.

e.

306. Select the formula for pentene-2 from the list:

a. CH3 - CH2 - CH2 - CH3

b. CH3 - CH = CH - CH3

c. CH3 - CH2 - CH2 - CH2 - CH3

d. CH3 - CH2 - CH2 - CH = CH2

e. CH3 - CH2 - CH = CH - CH3

307. Specify a compound having the most pronounced basic properties in the gas phase:

a. CH3-N(CH3)-CH3

b. CH3-NH-CH3

c.

d. NH3

e. CH3-NH2

308. Specify the correct name for the product of the acetaldehyde reacting with hydrazine:

a. Acetaldehyde semicarbazone

b. Acetaldehyde hydrazone

c. Acetaldimine

d. Acetaldehyde oxime

e. Acetaldehyde phenylhydrazone

309. Select a conjugated diene from the list of diene hydrocarbons:

a.

b. CH2 = CH - CH2 - CH2 - CH = CH2

c. CH2 = C = CH - CH3

d. CH2 = CH - CH2 - CH = CH2

e. CH2 = CH - CH = CH2

310. Under the given conditions, the unsaturated organic compounds are reduced with the following reagent:

a. NaOH, H2O

b. HNO3, p, t

c. H2, Ni, t

d. K2Cr2O7, H+

e. H2O, Hg2+, H+

311. Which of the following compounds relates to the conjugated dienes?

a. CH2 = CH - CH2 - CH2 - CH = CH2

b. CH2 = C = CH - CH2 - CH2 - CH3

c. CH3 - CH2 - CH = CH - CH = CH2

d. CH3 - CH = C = CH - CH2 - CH3

e. CH3 - C(CH2) - CH2 - CH = CH2

312. Which of the following solutions with the same molar concentration has the maximum osmotic pressure?

a. Potassium iodide

b. Aluminium nitrate

c. Sodium chloride

d. Glucose

e. Magnesium sulfate

313. What class of organic compounds is characterized by the presence of C ≡ N group?

a. Nitriles

b. Nitro compounds

c. Aldehydes

d. Alcohols

e. Amines

314. If the amount of a high-molecular substance added to the sol is very small, it may not increase but decrease its stability. This phenomenon is called:

a. Colloidal protection

b. Sol habituation

c. Solubilization

d. Mutual coagulation

e. Sensibilization

315. Which medicinal plant of the Asteraceae family has only disk flowers in the flowerhead?

a. Echinacea purpurea

b. Dandelion (Taraxacum officinale)

c. Three-part beggarticks (Bidens tripartita)

d. Cornflower (Centaurea cyanus)

e. Common yarrow (Achillea millefolium)

316. Spore and pollen analysis revealed in the pollen some tetrahedral spores with a semi-circular base and a reticular surface, which may belong to:

a. Lycopodiophyta

b. Bryophyta

c. Pinophyta

d. Polypodiophyta

e. Equisetiphyta

317. Many species of wild rose are a source of vitamins, fatty oils and herbal material. Specify the juicy pseudocarps that are procured as herbal raw material:

a. Hesperides

b. Coenobia

c. Rose hips

d. Aggregate-accessory fruits

e. Cenocarp stone-fruits

318. Comparison of the underground organs of herbaceous plants revealed that in the bipartite annuals the following organ prevails:

a. Corm

b. Main root system

c. Rhizome

d. Adventitious root system

e. Bulb

319. Growth of some cancer cells is caused by a certain growth factor. Treatment of leukemia involves applying an enzyme that destroys this essential factor. Specify this enzyme:

a. Asparaginase

b. Succinate dehydrogenase

c. Aspartate aminotransferase

d. Citrate synthase

e. Glutaminase

320. The anti-tumor preparation Methotrexate is a structural analogue of folic acid. The mechanism of its action is based on the inhibition of the following enzyme:

a. Dihydrofolate reductase

b. Hexokinase

c. Lactate dehydrogenase
d. Creatine kinase
e. Xanthine oxidase

321. A sample of a finished dosage form was found to be contaminated with some microorganisms exhibiting the following properties: greenish fluorescent colonies of gram-negative nonsporeforming bacilli that grew on the medium for the detection of pyocyanin. The bacilli release the bluegreen pigment into the medium.What microorganisms contaminated the finished dosage form?
a. Staphylococcus epidermidis
b. Staphylococcus saprophyticus
c. Enterobacteriaceae
d. Staphylococcus aureus
e. Pseudomonas aeruginosa

322. Vaccines are the artificial or natural preparations produced from bacteria, viruses and other microorganisms, their chemical components and waste products. They are used for the active immunization of humans and animals for the prevention and treatment of infectious diseases. The attenuated vaccines consist of:
a. Dead microbes and toxoid
b. Immunoglobulins
c. Dead microbes
d. Anatoxin
e. Viable microbes

323. What method of sterilization should be used during the manufacturing liquid dosage forms containing proteins?
a. Pasteurization
b. Filtering
c. Gas sterilization
d. Boiling
e. Autoclaving

324. Addison’s (bronze) disease is treated with glucocorticoids. Their effect is provided by the potentiation of the following process:
a. Glycogenolysis
b. Ornithine cycle
c. Glycolysis
d. Pentose phosphate cycle
e. Gluconeogenesis

325. Representatives of Asteraceae family have various types of flowers EXCEPT FOR:
a. Pseudoligulate
b. Bilabiate
c. Funnelform
d. Tubular
e. Ligulate

326. Datura stramonium has dry manyseeded fruits formed by syncarpous gynoecium that dehisce when the valves are broken off. Specify the fruit type:
a. Siliqua
b. Follicle
c. Capsule
d. Coenobium
e. Hesperidium

327. A sample of water used in drug production has been sent to a laboratory for sanitary and virological analysis. Presence of what virus group will be indicative of faecal contamination of water and thus the need for its additional purification?

a. Retroviridae
b. Flaviviridae
c. Herpesviridae
d. Orthomyxoviridae
e. Picornaviridae

328. Specify the order of the reaction, for which K=1/t (1/c - 1/c0):
a. Zeroth
b. Fractional
c. Third
d. First
e. Second

329. After an insulin injection a 45-yearold female with a long history of diabetes mellitus has developed weakness, paleness, palpitation, anxiety, double vision, numbness of lips and the tip of tongue. Blood glucose is at the rate of 2,5 mmol/l. What complication has developed in the patient?
a. Hyperketonemic coma
b. Uremic coma
c. Hyperosmolar coma
d. Hyperglycemic coma
e. Hypoglycemic coma

330. A 45-year-old male patient was diagnosed with stomach ulcer. After the conservative treatment the pain and heartburn disappeared, the function of the gastrointestinal tract was normalized. Endoscopic examination of stomach revealed cicatrization of the ulcer. Qualify this course of the disease:
a. Prodromal stage
b. Remission
c. Latent period
d. Relapse
e. Recovery

331. An older patient exhibits low levels of red blood cells and hemoglobin in blood, but the color index is 1,3. Blood smear analysis revealed megaloblasts. What type of anemia is observed in this case?
a. Acquired hemolytic
b. Iron-deficiency
c. B12-folic acid deficiency
d. Hereditary hemolytic
e. Chronic posthemorrhagic

332. Morphological analysis of poplar inflorescence showed that it is a simple monopodial inflorescence: main axis is drooping, the flowers are sessile, unisexual. Specify the type of inflorescence:
a. Catkin
b. Capitulum
c. Panicle
d. Cyme
e. Head

333. During the morphologic analysis of various plant leaves the students found the leaves, whose length of the leaf blade is 5 times more than its width. Specify the shape of the leaf blade:
a. Ovoid
b. Reniform
c. Elliptical
d. Lanceolate
e. Linear

334. Food rich in carbohydrates at first increases the blood sugar and then decreases its rate due to the insulin action. What process is activated by this hormone?

a. Breakdown of glycogen
b. Gluconeogenesis
c. Synthesis of glycogen
d. Breakdown of proteins
e. Breakdown of lipids

335. After drinking milk a 1-year-old child developed diarrhea, flatulence. The baby is likely to have the deficiency of the following enzyme:

a. Lactase
b. Aldolase
c. Glycosidase
d. Hexokinase
e. Maltase

336. A patient has developedmegaloblastic anemia on a background of alcoholic cirrhosis. The main cause of anemia in this patient is the following vitamin deficiency:

a. Lipoic acid
b. Thiamin
c. Pantothenic acid
d. Folic acid
e. Biotin

337. The fruit of black locust is dry, formed of a single carpel, dehisces by the ventral and dorsal sutures on two sides, the seeds are attached along the ventral suture. Such fruit is called:

a. Legume
b. Follicle
c. Silicula
d. Capsule
e. Siliqua

338. At a chemical analytical laboratory, a technician examines a solution of the VI analytical group cations. After the addition of ammonium thiocyanate and amyl alcohol, the organic layer turned blue. What cation is present in the solution?

a. Cu^{2+}
b. Ni^{2+}
c. Co^{2+}
d. Hg^{2+}
e. Cd^{2+}

339. Microscopic study of soybean seeds stained with Sudan III revealed some droplets of various sizes. They are:

a. Lipids
b. Starch
c. Glycogen
d. Inulin
e. Proteins

340. An analytical chemist determines sodium cations by ion-exchange chromatography. In order to prepare the cation-exchange resin in the H^+ form, the analyst uses:

a. HCl
b. C_2H_5OH
c. CH_3OH
d. H_3PO_4
e. CH_3COOH

341. When studying the diagnostic features of Origanum vulgare, the students noticed that the plant

had a compound monopodial inflorescence. It is called:
a. Head
b. Corymbose panicle
c. Cincinnus
d. Cluster of heads
e. Bostyx

342. While preparing a solution, a pharmaceutical analyst converted a freshly formed precipitate into a sol by treating it with an electrolyte solution. What method of obtaining disperse systems was used by the analyst?
a. Condensation from steam
b. Peptization
c. Chemical condensation
d. Physical condensation
e. Solvent exchange method

343. Sol of iron (III) hydroxide is positively charged. Specify the ion which has the lowest coagulation threshold:
a. Cu2+
b. Cl-
c. SO42-
d. Na+
e. J-

344. The method of treating people with serious diseases and intoxications is based on the absorption of toxic substances from the blood. What is this method called?
a. Hemadsorption
b. Electrophoresis
c. Hemosorption
d. Dialysis
e. Ultrafiltration

345. It is known that malonyl CoA is formed from acetyl CoA and carbon dioxide under the influence of acetyl CoA carboxylase. What vitamin is a coenzyme of this enzyme?
a. Folic acid
b. Ascorbate
c. Thiamine
d. Biotin
e. Pantothenic acid

346. Specify the standard solutions that are used in permanganatometry to quantify the oxidants by the residual titration method:
a. Potassium dichromate, sodium thiosulfate
b. Potassium iodate, sodium thiosulfate
c. Cerium (IV) sulfate, iron (II) sulfate
d. Potassium permanganate, iron (II) sulfate
e. Potassium bromate, sodium thiosulfate

347. What indicator is used for fixing the endpoint of mercurimetric titration?
a. Fluorescein
b. Murexide
c. Potassium chromate
d. Thiocyanate complexes of iron (III)
e. Eosin

348. Vitamin B1 deficiency has a negative effect on a number of processes. This is caused by the dysfunction of the following enzyme:
a. Glutamate

b. Lactate dehydrogenase
c. Aminotransferase
d. Succinate dehydrogenase
e. Pyruvate dehydrogenase complex

349. A patient with tuberculosis has been prescribed some anti-TB preparations. Which of the following chemotherapeutic drugs has an effect on the tuberculosis pathogen?
a. Phtalazolum
b. Ftivazide
c. Methisazonum
d. Furacilinum
e. Sulfadimezinum

350. Many diseases of medicinal plants are caused by bacteria of the Pseudomonas genus. Select the bacteria relating to this genus:
a. Proteus
b. Colon bacillus
c. Blue pus bacillus
d. Mycoplasma
e. Micrococci

351. Microbiological studies of air in the pharmacy room revealed the presence of pathogenic staphylococci. Select the medium in which you can detect the lecithinase activity of the isolated microorganism:
a. Sugar agar
b. Meat-extract agar
c. Blood agar
d. Bismuth sulfite agar
e. Yolk-salt agar

352. Colloid silver preparations Protargolum and Collargolum are widely used in medical practice as bactericidal drugs. In addition to the active ingredients, these drugs contain protein compounds. What is the function of proteins in these preparations?
a. Prevention of coagulation of the colloidal solution
b. Reduction of the side effects
c. Potentiation of the bactericidal action of silver
d. Improvement of the drug technology
e. Prolongation of shelf-life

353. Therapeutic preparations for topical use (transdermal, vaginal, etc.) do not require sterility. However, the total permissible number of microbial cells and fungi in 1 g (ml) of a drug should not exceed:
a. 10
b. 1000
c. 10 0000
d. 100
e. 500

354. P.Ehrlich is considered to be the founder of modern chemotherapy. What chemotherapy drug was developed by this scientist?
a. Solusurminum
b. Novarsenolum
c. Osarsolum
d. Salvarsan
e. Calomel

355. A patient was admitted to a hospital in a state of hypoglycemic coma. It occurs at the following level of blood glucose:

a. 5,5 mmol/l
b. 2,5 mmol/l or less
c. 3,3 mmol/l
d. 4,0 mmol/l
e. 4,5 mmol/l

356. A patient who had been continuously treated with glucocorticoids was found to have a duodenal ulcer. What mechanism plays a major part in its development?
a. Hyperglycemia
b. Increase of gastric juice secretion and acidity
c. Inhibition of gastrin secretion in the stomach
d. Acceleration of histamine inactivation in the stomach
e. Excess production of prostaglandin E

357. To isolate the lead (II) chloride from the other cations of the II analytical group in the systematic analysis, the chloride precipitate should be processed with:
a. Ammonia solution
b. Acetate acid solution
c. Alkali solution
d. Hot water
e. Nitric acid solution

358. What reagent is used to separate the cations of copper (II) and mercury from the other cations of the VI analytical group?
a. Potassium sulfide
b. Excess of the concentrated ammonia solution
c. Sodium sulfate
d. Bromine water
e. Sodium thiosulfate

359. For cultivation of Brucella, pure cultures should be incubated in CO2 enriched atmosphere. What type of breathing is typical for Brucella?
a. Facultative anaerobic
b. Obligate aerobic
c. Any
d. Capnophilic
e. Obligate anaerobic

360. Some success in reducing malaria transmission was achieved through the mass destruction of transmitting mosquitoes and their larvae. The measures aimed at the destruction of insects are called:
a. Disinfestation
b. Deratization
c. Decontamination
d. Sterilization
e. Disinfection

361. On the photomicrograph of a herbaceous plant stem the bicollateral vascular bundles are clearly visible. The microspecimen represents the stem of the following plant:
a. Corn
b. Solomon’s seal
c. Rye
d. Flax
e. Pumpkin

362. What type of conducting bundles is typical for all root zones of one-seeded plants?
a. Collateral
b. Radical

c. Central xylem
d. Central phloem
e. Bilateral

363. Antidepressants can increase the concentartion of catecholamines in the synaptic cleft. What is the mechanism of action of these drugs?
a. Activation of monoamine oxidase
b. Activation of acetylcholinesterase
c. Inhibition of acetylcholinesterase
d. Inhibition of monoamine oxidase
e. Inhibition of xanthine oxidase

364. The figwort family Scrophulariaceae includes a biennial plant up to 1,5 m high, with golden-yellow flowers gathered in spiked inflorescences. The flowers have five stamens. Specify this plant:
a. Digitalis Ferruginea
b. Verbascum flomoides
c. Digitalis grandiflora
d. Digitalis purpurea
e. Digitalis lanata

365. Permanganometric titration of hydrogen peroxide is carried out in the following medium:
a. Nitrate
b. Alkaline
c. Sulfate
d. Hydrochloric
e. Alcohol

366. Quantitative analysis of zinc salts is performed by method of trilonometry. What indicator is used for this purpose?
a. Phenolphtalein
b. Potassium dichromate
c. Thymol blue
d. Eriohrome black T
e. Methyl black

367. In response to the administration of protein drugs, a patient developed an allergic reaction. The development of the allergic reaction is caused by the increased synthesis of the following compound:
a. Histamine
b. Adrenaline
c. Serotonin
d. Histidine
e. Choline

368. Astragalus dasyanthus has sessile flowers gathered into inflorescences with a short thick axis. This kind of inflorescence is called:
a. Capitulum
b. Raceme
c. Calathidium
d. Head
e. Cyme

369. The technology of drug production widely uses the phenomena of absorption and ion exchange. Which of the ions will be selectively adsorbed on the surface of a silver chloride crystal from an aqueous solution?
a. OH^-
b. Ag^+
c. NO_3^-

d. Cu2+
e. H+

370. A patient with acute myocarditis exhibits rapid fatigability, shortness of breath, edemata of legs, hepatomegaly. Classify the type of heart failure by the mechanism of its development:
a. Subcompensated
b. Combined
c. Overload
d. Compensated
e. Myocardial

371. A child with PKU has an unpleasant mouse-like odor, growth retardation, mental retardation.These symptoms are associated with the high concentration of the following substance in blood:
a. Cholesterol
b. Glucose
c. Phenylpyruvic acid
d. Adrenaline
e. Uric acid

372. After a contact with a person having an infectious diseases, the disease pathogens entered the patient’s body and started to multiply, but the symptoms of the disease were not yet observable. What period of the disease is this typical for?
a. Manifest illness stage
b. Prodromal
c. Latent
d. Clinical outcome
e. Relapse

373. Extraction is commonly used in pharmacy for separating mixtures, increasing the concentration of any solute and extracting lipophilic compounds from the herbal material. This process is based on:
a. Third law of thermodynamics
b. Hess’s Law
c. Konovalov’s first law
d. Dalton’s second law
e. Nernst distribution law

374. The rate of extraction of a drug substance depends on the value of its distribution coefficient. If the distributed substance is characterized by different rates of dissociation or association in different phases, the distribution coefficient is calculated by:
a. Nernst distribution law
b. The first Raoult’s law
c. Van’t Hoff rule
d. Shilov-Lepin equation
e. Gibbs’ phase rule

375. A male patient developed fever up to 40oC, there are vomiting, diarrhea, the patient is in grave condition. Blood osmolality is 270 mOsm/l. What disorder of water-salt metabolism is observed in the patient?
a. Hypoosmolar hyperhydration
b. Hypoosmolar hypohydration
c. Hyperosmolar hypohydration
d. Isoosmolar hypohydration
e. Isoosmolar hyperhydration

376. A 40-year-old male presented to the endocrinology department with disproprortionate enlargement of limbs, mandible and nose. These manifestations are caused by the overproduction of the following hormone:

a. Vasopressin
b. Somatostatin
c. Aldosterone
d. Corticotropin
e. Adrenaline

377. Surfactants are commonly used in pharmaceutical production. What kind of surfactant is potassium oleate?
a. Amphoteric
b. None of the above
c. Cationic
d. Nonionic
e. Anionic

378. Diabetes and starvation cause the excess production of ketone bodies that are used as an energy source. They are produced from the following compound:
a. Acetyl-CoA
b. Lactate
c. Ketoglutarate
d. Malate
e. Isocitrate

379. Allantoic fluid of a chicken embryo contaminated with nasopharyngeal flush of a patient was found to contain a virus. What diagnostic agents should be used to identify it?
a. Standard antiviral sera
b. Serum preparations
c. Polyvalent immune diagnostic sera
d. Diagnosticums produced of standard virus strains
e. Viral diagnosticums

380. A patient complains of severe abdominal pain, cramps, blurred vision. His relatives exhibit the same symptoms. The urine is of red colour. The patient has been hospitalized for acute intermittent porphyria. This disease might have been caused by the impaired synthesis of the following compound:
a. Bile acids
b. Insulin
c. Heme
d. Prostaglandins
e. Collagen

381. Common nettle, hop, black elderberry relate to the plants that require soils rich in nitrogen compounds, that is, such plants are called:
a. Nitrophobes
b. Calciphobes
c. Halophytes
d. Nitrophytes
e. Calciphiles

382. A 40-year-old female farmworker has been diagnosed with brucellosis and administered causal chemotherapy. What group of drugs will be used for this purpose?
a. Antitoxic serum
b. Antibiotic
c. Inactivated therapeutic vaccine
d. Donor immunoglobulin
e. Polyvalent bacteriophage

383. A male received a radiation dose of 30 Gy. He presents with necrotic angina, disorders of the gastrointestinal tract. Blood tests revealed anemia, leukopenia and thrombocytopenia. What phase of

acute radiation syndrome is observed in the patient?

a. Latent
b. Primary reactions
c. Manifest illness stage
d. Outcome of disease
e. -

384. As a result of hypothermia a male patient developed acute diffuse glomerulonephritis. What type of allergic reaction caused damage to the glomerular capillaries in the patient?

a. Cell-mediated
b. Stimulating
c. Anaphylactic
d. Cytotoxic
e. Immunocomplex

385. A patient with hyperproduction of thyroid hormones has been prescribed Merkazolilum. This drug inhibits the following enzyme of iodothyronine synthesis:

a. Aminotransferase
b. Iodide peroxidase
c. Reductase
d. Aromatase
e. Decarboxylase

386. A patient with Parkinson’s disease exhibits low level of dopamine which is produced from dihydroxyphenylalanine (DOPA). What enzyme catalyzes this conversion?

a. Aminotransferase
b. Carboxypeptidase
c. Deaminase
d. Hydrolase
e. Decarboxylase

387. As a result of an emergency situation (shipwreck) a man had to drink sea (salty) water. What form of water-salt imbalance may occur in this case?

a. Hypoosmolar hyperhydration
b. Isoosmolar hyperhydration
c. Isotonic hyperhydration
d. Hyperosmolar hyperhydration
e. Hypotonic hyperhydration

388. Hemoglobin catabolism results in release of iron which is transported to the bone marrow by a certain transfer protein and used again for the synthesis of hemoglobin. Specify this transfer protein:

a. Ceruloplasmin
b. Albumin
c. Transcobalamin
d. Haptoglobin
e. Transferrin (siderophilin)

389. A laboratory received a food product that had been taken from the focus of food poisoning and presumably contained botulinum toxin. To identify the type of toxin, the neutralization reaction must be performed on white mice.What biological product is used in this reaction?

a. Diagnosticum
b. Allergen
c. Normal serum
d. Antibacterial serum
e. Antitoxic serum

390. For the specific prevention of influenza, the employees of an enterprise were vaccinated with "Influvac". What type of immunity will develop in the body of the vaccinated?

a. Natural active
b. Natural passive
c. Innate congenital
d. Artificial passive
e. Artificial active

391. Suspension is a form of pharmaceuticals used in medical practice. Which pair of substances is able to forma suspension?
a. Water-oil
b. Ethanol-ethyl acetate
c. Ethanol-diethyl ether
d. Water-clay
e. Water-ethanol

392. In a sample studied under a microscope the multilayer palisade (columnar) parenchyma can be clearly seen. Such structure is typical for:
a. Leaf
b. Dicotyledon stem
c. Adventitious roots
d. Rhizomes of ferns
e. Root

393. A patient exhibits small (petechial) hemorrhages under the skin and mucous membranes, bleeding gums, tooth decay, general weakness, edemata of the lower extremities. What vitamin deficiency can be suspected?
a. C
b. A
c. E
d. D
e. B1

394. A parturient woman diagnosed with uterine inertia has been delivered to the maternity ward. The doctor gave her an injection of the drug that activates the contraction of smooth muscles of the uterus. What hormone is a component of this drug?
a. Oxytocin
b. Secretin
c. Bradykinin
d. Angiotensin
e. Gastrin

395. Soil microflora often includes the representatives of pathogenic microorganisms. Specify the diseases, whose causative agents may say viable in the soil for a long time:
a. Tuberculosis and mycobacterioses
b. Leptospirosis and plague
c. Typhoid fever and dysentery
d. Tetanus and gas anaerobic infection
e. Colibacillosis and cholera

396. The one-way penetration of solvent molecules into the polymer phase resulting in complete dissolution of the polymer is called:
a. Thixotropy
b. Unlimited swelling
c. Coacervation
d. Limited swelling
e. Salting-out

397. In a child-rearing facility there was an outbreak of measles. What specific urgent prophylaxis should be administered to contact UNVACCINATED children?

a. DPT vaccine
b. Measles virus vaccine live
c. Gamma globulin against measles
d. Medical screening of the children
e. Isolation and treatment of infected children

398. Bouguer-Lambert-Beer law is the basis of molecular absorption analysis. According to this law, optical density of a solution is:
a. Directly proportional to concentration and inversely proportional to absorption coefficient
b. Directly proportional to layer thickness and concentration of a substance
c. Inversely proportional to layer thickness and concentration of a substance
d. Directly proportional to layer thickness and absorption coefficient
e. Directly proportional to concentration and inversely proportional to layer thickness

399. Within folded parenchyma of a fir needle there are cavernous structures filled with galipot and lined with live thin-walled secretory cells. Name these structures:
a. Nectar glands
b. Resin ducts
c. Hydatodes
d. Laticifers
e. Glandules

400. A chemotherapeutic agent has bactericidal effect against streptococci, staphylococci, bacilli, and clostridia. According to its action spectrum this drug belongs to the following group:
a. Broad spectrum antifungal agents
b. Narrow spectrum antibacterial agents
c. Broad spectrum antibacterial agents
d. Antiviral agents
e. Antituberculous agents

401. Stem thickening occurs due to functioning of the following structures:
a. Wound meristem
b. Apical meristem
c. Lateral meristem
d. Intercalary meristem
e. Endoderm

402. To determine mass fraction of sodium chloride in a drug, the Fajans method should be applied. Titration is to be performed in the presence of the following indicator solution:
a. Ammonium iron (III) sulfate
b. Phenolphthalein
c. Methyl red
d. Potassium chromate
e. Fluorescein

403. Sulfanilamide drugs contain primary aromatic amides in their structure. Specify the method of quantitative determination of these compounds:
a. Cerimetry
b. Nitritometry
c. Dichromatometry
d. Iodometry
e. Permanganatometry

404. Microbe survival within environment is facilitated by spore formation. What microorganisms of those listed below are spore formers:
a. Clostridia
b. Staphylococci
c. Peptostreptococci

d. Peptococci
e. Bacteroides

405. Synthesis of a medicinal substance occurs in an isolated system. What is a direction criterion of spontaneous processes?
a. Entropy change
b. Helmholtz energy
c. Enthalpy
d. Intrinsic energy
e. Gibbs energy

406. Dissociation degree in 0,01 M water solution is the same for all the strong electrolytes listed below. Name the substance with the highest boiling temperature of such solution:
a. K3PO4
b. Al2(SO4)3
c. Na3PO4
d. KCl
e. Cu(NO3)2

407. Proteins are of great importance for vital functions. What value of pH results in zero electrophoretic mobility of gelatin (gelatin isoelectric point equals 4,7)?
a. 7,0
b. 5,5
c. 9,4
d. 4,7
e. 14,0

408. Enzymes are widely used as drugs in pharmacy. What is the main difference that separates enzymes from non-biological catalysts?
a. High universality
b. High dispersion
c. High homogeneity
d. High specificity and selectivity
e. Low universality

409. Chloroform and sodium nitrite solution were added into the acidulous investigated solution. The chloroform layer colored red-violet, which indicates the presence of:
a. Iodide ions
b. Chloride ions
c. Fluoride ions
d. Sulfate ions
e. Carbonate ions

410. The following should be used for sterilization of laboratory glassware in a microbiological laboratory:
a. Hot-air sterilizer
b. Koch’s steam sterilizer
c. Bactericidal lamps
d. Disinfectant
e. Bacteria-excluding filters

411. Parents of a 10-year-old child have made an appointment with an endocrinologist due to complaints of the child’s low height. The child’s appearance is corresponding with that of a 5-yearold. What hormone causes such changes in physical development, if its secretion is disturbed?
a. Testosterone
b. Insulin
c. Adrenocorticotropic hormone
d. Thyroxin

e. Somatotropic hormone

412. Dry residue received after evaporation of the investigated solution turns previously colorless burner flame yellow, which is observed as violet through blue glass. What cations are there in the dry residue?

a. Na+ , Sr2+
b. Ca2+, K+
c. Na+, K+
d. Li+, Ba2+
e. Na+, Ca2+

413. A smear of purulent excharge from urethra contains gram-negative beanshaped diplococci with both extra- and intracellular positions. Make the provisional microbiological diagnosis:

a. Trichomoniasis
b. Candidiasis
c. Syphilis
d. Chlamydiosis
e. Gonorrhea

414. Under isobaric-isothermal conditions the possibility and direction of spontaneous processes can be predicted through change of:

a. Entropy
b. Intrinsic energy
c. Helmholtz energy
d. Enthalpy
e. Gibbs energy

415. Investigated solution contains potassium and ammonium ions. Specify the reagent that can indicate the presence of potassium ions in this solution:

a. Sodium chloride
b. Potassium hexacyanoferrate (II)
c. Uranyl zinc acetate
d. Potassium tetraiodomercurate
e. Sodium acetate

416. An injured person exhibits the following signs at the site of trauma: skin redness, throbbing small arteries, elevated local temperature, increased tissue turgor. What local blood circulation disorder are these presentations typical of?

a. Thrombosis
b. Venous hyperemia
c. Arterial hyperemia
d. Embolism
e. Ischemia

417. During investigation of bacterial contamination of air it is necessary to take into account both total amount of microorganisms in a certain volume and qualitative content of microflora. What microorganisms are the sanitary indicators of air contamination within enclosed spaces?

a. Yeast fungi
b. Mold fungi
c. Colibacillus
d. Hay bacillus
e. Staphylococcus aureus

418. Purine ring biosynthesis occurs in ribose-5-phosphate through gradual accumulation of nitrogen and carbon atoms and closing of the rings. The source of ribose phosphate is the process of:

a. Glycolysis
b. Gluconeogenesis
c. Glycogenolysis

d. Pentose phosphate cycle
e. Glyconeogenesis

419. Number of freedom degrees at the point of intersection of liquidus with Y-axis on the fusibility chart of a twocomponent system would equal:
a. 4
b. 1
c. 2
d. 3
e. 0

420. In the process of qualitative analysis to determine strontium ions, so-called ”gypseous water” is used. This substance can be defined as:
a. Solution of $Ba(OH)_2$
b. Concentrated aqueous solution of $CaSO_4$
c. Concentrated aqueous solution of CO_2
d. Solution of $Ca(OH)_2$
e. Aqueous solution of $Ba(NO_3)_2$

421. Which of the ligands is bidentate?
a. Cyanide ion
b. Thiocyanate ion
c. Ethylenediamine
d. Pyridine
e. Hydroxide ion

422. Name the pH value, under which occurs the most intense color change of an indicator:
a. pT value
b. Color change interval
c. Titration end point
d. Equivalence point
e. pK value

423. What compound produces phthalic acid during oxidation?
a.
b.
c.
d.
e.

424. To distinguish between phenol and salicylic acid the following reagent is used:
a. Sodium bicarbonate solution
b. Sodium hydroxide solution
c. Bromine solution
d. Sodium chloride solution
e. Iron (III) chloride solution

425. Reaction of benzaldehyde with chlorine produces:
a.
b.
c.
d.
e.

426. Bacterial culture obtained from patient DOES NOT grow when exposed to oxygen. Conditions suitable for bacterial culture growth can be created in:
a. Anaerobic culture jar
b. Pasteur oven
c. Oxidative medium

d. Krotov apparatus
e. Serum-supplemented medium

427. Specify the number of electrons that participate in creation of closed conjugated system within the pyrimidine molecule:
a. 8
b. 6
c. 10
d. 4
e. 2

428. An oncological patient was prescribed fluorouracil that is a competitive inhibitor of thymidine synthase. It inhibits the process of:
a. Purine nucleotides disintegration
b. Lipids synthesis
c. Carbohydrate disintegration
d. Purine nucleotides synthesis
e. Pyrimidine nucleotides synthesis

429. During feces analysis of a 3-monthold child with signs of enteric infection, numerous dark-red colonies has grown on Endo agar. What microorganisms can be the cause of such enteric infection?
a. Streptococci
b. Salmonellae
c. Shigella
d. Escherichia
e. Gonococci

430. Sedimentation analysis has been applied for assessment of air purity in an aseptic unit of a phamacy. The test resulted in growth of the small colonies with areas of hemolysis. What medium was used for inoculation?
a. Blood agar
b. Endo agar
c. Egg-yolk salt agar
d. Ploskirev’s agar
e. Levine’s agar (Eosin Methylene Blue agar)

431. Reaction of urea with nitrous acid produces the following:
a. CO + NH3 + CO2
b. CO2 + NO2 + H2O
c. CO2 + N2 + H2O
d. CO2 + NO + NH3
e. CO2 + NH3 + NO2

432. Surface tension is an important characteristic of a liquid.What substance has maximal surface tension?
a. Ethanol
b. Acetone
c. Chloroform
d. Water
e. Benzene

433. What standard solution can be used to standardize the solution of I2?
a. Sodium thiosulfate solution
b. Potassium dichromate solution
c. Sodium nitrite solution
d. Potassium permanganate solution
e. Potassium iodide solution

434. Catalysts are widely used in production of drugs. How can reaction acceleration in the presence

of a catalyst be explained?
a. Molecule speed increases
b. Activation energy decreases
c. Activation energy increases
d. Total collision frequency increases
e. Collision frequency decreases

435. Microorganisms in the environment are being affected by various physical factors. What is the effect of high temperature on a microbial cell?
a. Transition into anabiosis state
b. Mutagenic effect
c. Irreversible degradation of all cellular structures
d. Albuminolysis
e. Fats saponification

436. A person has been stung by a bee. The stung area developed redness and edema. What is the main mechanism of edema development?
a. Increased permeability of the capillaries
b. Increased hydrostatic blood pressure
c. Disturbed lymphatic efflux
d. Decreased osmotic blood pressure
e. Decreased oncotic blood pressure

437. During identification of fruits of Datura family they were determined to be a:
a. Glossy black berry
b. Juicy globular cynarodium
c. Berry in an orange cup
d. Thorned quadrivalve capsule
e. Urceolate capsule with a lid

438. During examination of a patient with intestinal infection, inoculation in Endo medium resulted in multi-colored colonies: red and colorless. According to its purpose this medium can be determined as:
a. —
b. Differential diagnostic
c. Special
d. Universal
e. Selective

439. Formation enthalpy equals zero for the following substance:
a. CO_2
b. O_2
c. H_2SO_4
d. H_2O_2
e. $CaCO_3$

440. Nicotinic acid amide fulfills important metabolic function. What disorder develops, when it is deficient in the organism?
a. Pellagra
b. Anemia
c. Beriberi
d. Xerophthalmia
e. Rickets

441. At the triple point of the water phase diagram:
a. f=1
b. P=3; n=1
c. f=2
d. P=3; f=1

e. f=0

442. Reaction of benzene sulfonation produces:

a.

b.

c.

d.

e.

443. Choose the reaction of ester production among those listed below:

a.

b.

c.

d.

e.

444. Select the formula of diazonium salt:

a.

b. C6H5 ? N = O

c. (CH3)2N ? N = O

d. C6H5 ? NH ? C(O) ? CH3

e.

445. A patient was delivered into a resuscitation unit with signs of alcohol poisoning. The patient developed hypoxia of the following pathogenesis:

a. Hypoxic

b. Circulatory

c. Mixed

d. Tissue

e. Hemic

446. Select the compound with amphoteric properties (which reacts both with acids and bases and produces salts):

a.

b.

c.

d.

e.

447. Since 2005 in Asian and European countries there was recorded unusually high avian flu morbidity. Such spread of epidemic process can be determined as:

a. Pandemia

b. Endemia

c. Epizooty

d. Sporadic

e. Epidemic

448. Pharmacopoeia reaction to determine benzoate ions requires interaction with the solution of:

a. Iron (III) chloride

b. Resorcin

c. Diphenylamine

d. Acetic anhydride

e. Potassium chloride

449. Tricarboxylic acid cycle is a general way of carbohydrates, amino acids, and fatty acids oxidation. Specify the acid with which acetyl-CoA reacts first in tricarboxylic acid cycle:

a. Citric

b. Fumaric

c. Malic

d. Oxaloacetic
e. Isocitric

450. Specify the substance that results from the following reaction:
a. Acetic acid
b. Ethanal
c. Propanal
d. Ethanol
e. Propanone

451. Choose the indicator and titration method to determine hydrogen carbonate ions in a drug:
a. Phenolphthalein, acidimetry
b. Phenolphthalein, alkalimetry
c. Murexide, acidimetry
d. Methyl-orange, acidimetry
e. Methyl-orange, alkalimetry

452. Pharmacopoeia reaction to determine phosphate ions is a reaction with magnesia mixture. It results in production of white crystalline precipitate MgNH4PO4. Magnesia mixture consists of the following:
a. $MgCl_2$, $NH_3 \times H_2O$, NH_4Cl
b. $MnCl_2$, $NH_3 \times H_2O$, NaCl
c. $MgCl_2$, NH_4Cl
d. $MgCl_2$, $MnSO_4$, NH_4Cl
e. $MgCl_2$, NaOH, NaCl

453. An ophthalmologist has detected increased time of dark adaptation in a patient. What vitamin deficiency can result in such symptom?
a. A
b. K
c. B6
d. B1
e. C

454. Prolonged taking of cytostatic agents resulted in development of necrotic tonsillitis in the patient. It can be associated with the following changes in the leukocyte content:
a. Lymphocytosis
b. Agranulocytosis
c. Lymphopenia
d. Neutrophilic leukocytosis
e. Eosinopenia

455. During photosynthesis within plant cell chloroplasts there is short-term retained starch being produced, which rapidly hydrolyzes into glucose. This starch is called:
a. Primary
b. Transitory
c. Reserve
d. Resistant
e. Secondary

456. A patient with type I diabetes mellitus developed hyperketonemic coma. What acid-base imbalance will be observed in the patient?
a. Gaseous acidosis
b. Gaseous alkalosis
c. There will be no acid-base imbalances
d. Nongaseous acidosis
e. Nongaseous alkalosis

457. Reaction rate constant of a hypothetical reaction is measured as s?1. What is the order of this

reaction?

a. First-order

b. Second-order

c. Fractional-order

d. Third-order

e. Zero-order

458. Species character of Thymus serpyllum includes: apical inflorescences (flower heads), dark punctate glands on the inferior surface of a leaf, long hairs along the edge of leaf base, and:

a. Stems with prickles

b. Thorns

c. Creeping stems

d. Climbing stems

e. Short decumbent stems

459. Natural peptides can perform various functions. What bioactive peptide is a major antioxidant and fulfills coenzyme functions?

a. Bradykinin

b. Liberin

c. Anserine

d. Glutathione

e. Oxytocin

460. Gout develops when purine nucleotide metabolism is disturbed. A doctor prescribed the patient allopurinol that is a competitive inhibitor of:

a. Alcohol dehydrogenase

b. Succinate dehydrogenase

c. Xanthine oxidase

d. Lactate dehydrogenase

e. Hexokinase

461. Specify the indicator of the protective properties of high-molecular compounds of body, which promote the retention of calcium, phosphate and carbonate in blood plasma:

a. Coagulation threshold

b. Hydrophilic-lipophilic balance

c. Volume of sol coagulated by 1 mol of the electrolyte substance

d. Protective value

e. Critical micelle concentration

462. In a research center there is a live vaccine against dysentery being created. What property of attenuated vaccine strain should coincide with the properties of original virulent strain of dysentery bacillus?

a. Antibiotic susceptibility

b. Toxin production

c. Morphology

d. Biochemical activity

e. Antigenic structure

463. Plantago major inflorescence grows at the apex, its rachis is long, with sessile flowers. Name this type of inflorescence:

a. Capitulum

b. Thyrse

c. Panicle

d. Spadix

e. Spike

464. Microbiological investigation of vaginal suppositories determined them to be CONTRARY to the Pharmacopoeia demands. What microflora was detected in the suppositories, resulting in such a

conclusion?
a. Citrobacter
b. Blue pus bacillus
c. Micrococcus
d. Sarcina
e. Tetracoccus

465. A number of hereditary diseases is caused by mutations in gene areas that determine beginning or end of an intron. What process results in removal of introns and joining of exons?
a. Splicing
b. Recombination
c. Translation
d. Replication
e. Transcription

466. Hyperlipemia can be observed in 23 hours after eating fatty food. 9 hours later lipid content normalizes again. How can this condition be characterized?
a. Hypertrophic obesity
b. Alimentary hyperlipemia
c. Hyperplastic obesity
d. Transport hyperlipemia
e. Retention hyperlipemia

467. Name the mercurimetry titrant:
a. 0,1 M solution of $AgNO_3$
b. 0,1 M solution of $NaNO_2$
c. 0,1 M solution of $Hg_2(NO_3)_2$
d. 0,1 M solution of KSCN
e. 0,1 M solution of NH_4SCN

468. What inflorescences are characteristic of Cruciferae (Brassicaceae) family?
a. Raceme or panicle
b. Capitulum or umbel
c. Spadix or panicle
d. Corymb or spike
e. Capitulum or corymb

469. What cation of the 4th analytical group is present in a solution, if its reaction with the group reagent results in formation of yellow precipitate?
a. $Sn(IV)$
b. Cr^{3+}
c. Sn^{2+}
d. Zn^{2+}
e. Al^{3+}

470. A patient presents with icteric sclera and mucous tunics; urine is dark; feces are light-colored. Blood content of direct and indirect bilirubin is increased, urine content of direct bilirubin is increased. What pathology can be characterized by these signs?
a. Jaundice of the newborn
b. Atherosclerosis
c. Hemolytic jaundice
d. Hepatocellular jaundice
e. Obstructive jaundice

471. The patient presents with rapid growth of a tumor node and its progressing malignization. What stage of tumor growth can be characterized by these presentations?
a. Inactivation
b. Progression

c. Transformation
d. Promotion (activation)
e. Exudation

472. You are studying a silvery downy plant of Asteraceae family, which is rich with essential oils and bitters. Harvested are apical sprouts with panicle of small round flower heads. This plant is:
a. Chamomilla recutita
b. Artemisia absinthium
c. Bidens tripartita
d. Arctium lappa
e. Calendula officinalis

473. Among dosage forms there are numerous disperse systems. Specify the free disperse system:
a. Membrane
b. Emulsion
c. Jelly
d. Gel
e. Diaphragm

474. A 55-year-old man, who had been suffering from mitral insufficiency for many years, developed acute heart failure. What pathophysiological type of heart failure can be observed in this case?
a. Due to hypoxic damage to the heart
b. Due to neurogenic damage to the heart
c. Due to acute cardiac tamponade
d. Due to cardiac overload
e. Due to coronarogenic damage to the heart

475. Cataract (lenticular opacity) has developed in a 52-year-old woman with diabetes mellitus. Lenticular opacity was caused by intensification of the following processes:
a. Protein proteolysis
b. Gluconeogenesis
c. Lipolysis
d. Ketogenesis
e. Protein glycosylation

476. During practice in the laboratory the students had been investigating in vitro, how malonate affects enzymes of tricarboxylic acid cycle. They detected accumulation of the following metabolite:
a. Fumarate
b. Succinyl-CoA
c. Malate
d. Isocitrate
e. Succinate

477. Aqueous solution of the following substance will have the smallest surface tension, if all the listed solutions are taken in the same concentration:
a. Sodium stearate
b. Sodium chloride
c. Sucrose
d. Sodium hydroxide
e. Ethanol

478. A 45-year-old woman, who for two weeks has been taking neodicoumarin (ethyl biscoumacetate) due to trombophlebitis, during a regular examination was detected to have decreased blood content of prothrombin, in urine there is microhematuria. What drug should be administered as a neodicoumarin antagonist?
a. Vicasol (Menadione)
b. Sodium citrate
c. Aminocapronic acid

d. Heparin
e. Protamine sulfate

479. A patient complaining of dry mouth, photophobia, and visual impairment has been delivered into an admission room. The skin is hyperemic and dry; pupils are dilated; tachycardia is observed. The patient was diagnosed with belladonna alkaloids intoxication. What drug would be advisable?
a. Armin
b. Dipiroxim
c. Aceclidine
d. Pilocarpine
e. Proserin

480. A child accidentally took a drink from the vial of grandmother's medicine for glaucoma. The medicine was identified as pilocarpine hydrochloride. What drug can be used as an antidote?
a. Carbachol
b. Benzohexonium (Hexamethonium)
c. Pentamin (Azamethonium bromide)
d. Atropine
e. Aceclidine

481. A woman suffering from neurosis has disturbed sleep.What drug is optimal for insomnia treatment?
a. Nitrazepam
b. Aethaminalum-natrium (Pentobarbital)
c. Valerian tincture
d. Bromisoval
e. Phenobarbital

482. What antiprotozoal drug can be recommended to a woman with trichomoniasis?
a. Primaquine
b. Solusurminum (Sodium stibogluconate)
c. Chiniofon
d. Metronidazole
e. Chloridine

483. Select the halogenated antiseptic that would be preferable for a child to pack in the first aid kit, when going to a summer camp:
a. Formaldehyde solution
b. Iodine alcoholic solution
c. Copper sulfate
d. Brilliant green
e. Methylene blue

484. Name the most typical symptom of atropine poisoning:
a. Low intraocular pressure
b. Dilated pupils unresponsive to light
c. Excessive sweating
d. Constricted pupils unresponsive to light
e. Bradycardia

485. .Apatient consulted an ophthalmologist about deterioration of twilight vision and xerophthalmus. What drug should the doctor prescribe?
a. Ascorbic acid
b. Cocarboxylase
c. Pyridoxine
d. Tocopherol
e. Retinol

486. A woman with hypertension came to a doctor complaining of dry cough that developed against

the background of her therapy.What antihypertensive drug was she taking?
a. Furosemide
b. Dichlothiazide (Hydrochlorothiazide)
c. Atenolol
d. Nifedipine
e. Lisinopril

487. Decreased absorption of tetracyclines, if they are taken simultaneously with antacids, is an example of their:
a. Synergism
b. Functional antagonism
c. Pharmaceutical incompatibility
d. Pharmacodynamic incompatibility
e. Pharmacokinetic incompatibility

488. A patient after craniocerebral trauma has been prescribed piracetam. What pharmacological group does this drug belong to?
a. Antipsychotics
b. Nootropic agents
c. Tranquilizers
d. Non-narcotic analgesics
e. General anesthetics

489. Recommend the patient with glaucoma an M-cholinomimetic agent:
a. Atropine sulfate
b. Levomycetin (Chloramphenicol)
c. Ephedrine hydrochloride
d. Sulfacyl-sodium (Sulfacetamide)
e. Pilocarpine hydrochloride

490. A patient with hypertension was prescribed a nonselective betaadrenergic blocking agent. Name this drug:
a. Anaprilin (Propranolol)
b. Proserin
c. Labetalol
d. Adrenalin hydrochloride
e. Prazosin

491. In the course of bronchitis pharmacotherapy a patient has developed dyspeptic disorders, photodermatitis and hepatic failure. What drug can cause such disorders?
a. Doxycycline
b. Ascorbic acid
c. Codeine phosphate
d. Acetylcysteine
e. Paracetamol

492. A 25-year-old woman with signs of acute morphine intoxication was administered naloxone, which rapidly improved her condition. What is the mechanism of action of this drug?
a. Serotonin receptor blockade
b. GABA receptor blockade
c. Opioid receptor blockade
d. Dopamine receptor blockade
e. Benzodiazepine receptor blockade

493. Name the ability of a drug to accumulate within the patient’s body:
a. Cumulation
b. Synergism
c. Allergy

d. Habituation
e. Antagonism

494. What pharmacological effect of acetylsalicylic acid allows its application in patients with ischemic heart disease for prevention of thromboses?
a. Antipyretic
b. Analgesic
c. Antiaggregant
d. Ulcerogenic
e. Anti-inflammatory

495. A patient developed herpetic rashes. What drug should be prescribed in this case?
a. Gentamicin
b. Benzylpenicillin
c. Biseptol (Co-trimoxazole)
d. Acyclovir
e. Clotrimazole

496. A woman complaining of sleep disturbance, fearfulness, and anxiety came to a neurologist. What drug should be prescribed in this case?
a. Nitroglycerine
b. Levodopa
c. Diazepam
d. Oxytocin
e. Lisinopril

497. A man developed cardiac arrest due to thoracic trauma. Name the drug that should be introduced into the cavity of the left ventricle in this case:
a. Proserin
b. Metoprolol
c. Salbutamol
d. Lisinopril
e. Adrenalin hydrochloride

498. A patient with acute heart failure was administered corglycon. What effect of this drug results in improvement of the patient’s condition?
a. Increased heart rate
b. Decreased oxygen demand of myocardium
c. Decreased heart force
d. Coronary vessels dilatation
e. Increased heart force

499. Explain to an intern, what is the mechanism of analgesic action of morphine hydrochloride:
a. Phosphodiesterase blockade
b. Histamine receptors blockade
c. Opiate receptors stimulation
d. Adenylate cyclase stimulation
e. Choline esterase blockade

500. What pharmacological effect of diazepam allows its application for termination of convulsions?
a. Anticonvulsant
b. Antipyretic
c. Hypnotic
d. Anti-inflammatory
e. Analgesic

501. A patient suffers fromhyperchromic B12-deficiency anemia. What vitamin preparation should be prescribed in this case?
a. Riboflavin

b. Thiamine chloride
c. Retinol acetate
d. Cyanocobalamin
e. Vicasol (Menadione)

502. A man is diagnosed with Parkinson's disease. What drug should be prescribed in this case?
a. Paracetamol
b. Nitrazepam
c. Levodopa
d. Aminazine
e. Anaprilin (Propranolol)

503. Direct titration CANNOT be applied for quantitative determination of calcium chloride by means of permanganatometry, because:
a. Side reactions are possible
b. The reaction runs slowly
c. The reaction runs very quickly
d. It is impossible to select the indicator to determine titration end point
e. The investigated substance does not interact with the titrant

504. Colored or white component of double perianth, which consists of petals, is a:
a. Flower cup
b. Gynoecium
c. Perigonium
d. Corolla
e. Androecium

505. A 54-year-old man requested a pharmacist's advice on drug prescription. The patient has 4-year-long history of chronic glomerulonephritis and 2-yearlong history of persistent hypertension. What substance synthesized in the kidneys has important role in development of arterial hypertension?
a. Catecholamines
b. Renin
c. Aldosterone
d. Nitric oxide
e. Histamine

506. A patient complains of general weakness, muscle weakness in the extremities (if the patient is asked to make a fist several times in a row, for example, the patient is capable of doing it only once), facial muscles are weak, swallowing is disturbed. Administration of acetylcholinesterase drugs removes these disturbances to a certain degree. Determine the pathology:
a. Paresis
b. Paralysis
c. Myasthenia
d. Hemiplegia
e. Monoplegia

507. A drug solution sterilized by means of boiling was tested for sterility. Inoculation on Kitt-Tarozzi medium revealed clostridia. Clostridia survived the boiling because they are:
a. Spore-formers
b. Anaerobic
c. Acid-fast
d. Prototrophic
e. Thermophilic

508. A 71-year-old woman developed mechanical jaundice due to obstruction of the bile duct with a chololith. Decrease of blood pressure and bradycardia are detected. These changes in functioning of the patient's cardiovascular system are caused by increased blood content of the following

substance:
a. Urobilin
b. Stercobilin
c. Direct bilirubin
d. Indirect bilirubin
e. Bile acids

509. A sanitary-epidemic station employee has been poisoned when the premices were processed with an organophosphorous insecticide. What enzyme is inhibited by organophosphorous compounds?
a. Lactate dehydrogenase
b. Catalase
c. Pepsin
d. Acetylcholinesterase
e. Xanthine oxidase

510. Indican excretion is a diagnostic criterion of intencified protein putrefaction in the intestine. Name the end product of tryptophan ”decay” occurring in the large intestine:
a. Mercaptan
b. Hydrogen sulfide
c. Putrescine
d. Benzoic acid
e. Indole

511. The second stage of detoxification involves joining certain chemical compounds with functional groups of toxines. Select one such compound:
a. Pyruvate
b. Glucuronic acid
c. Cholesterol
d. Higher fatty acids
e. Glucose

512. Actinomorphic apopetalous corolla include:
a. Cruciform
b. Campanulate
c. Ligulate
d. Tubular
e. Funnelform

513. Selective medium can be used to separate various species of bacteria in a bacteriological laboratory.What medium of those listed below can be determined as selective?
a. Meat infusion broth
b. Hiss’ serum water medium
c. Endo agar
d. Alkaline peptone water
e. Meat infusion agar

514. A 5-year-old child presents with abdominal distension, abdominal cramps, and diarrhea occurring 1-4 hours after drinking milk. Described symptoms are caused by the lack of enzymes that break up:
a. Fructose
b. Lactose
c. Maltose
d. Glucose
e. Saccharose

515. If pH of a solution is lower than its isoelectric point, itmeans in this solution:
a. Certain protein aggregates are formed
b. Anion and cation forms of amino acids are balanced
c. Cation forms of amino acids are prevalent

d. Irreversible protein precipitation occurs
e. Anion forms of amino acids are prevalent

516. Avidin - an egg white protein inhibits reception of biotin (carboxylase coenzyme) by the body. What reaction will be blocked by avidin administration?
a. NH3 detachment from glutamine
b. NH3 attachment to glutamate
c. CO2 attachment to pyruvate
d. Detachment of phosphate residuals
e. Beta-oxidation of fatty acids

517. During mercurimetric titration of halogenide ions in the presence of diphenylcarbazone, at the titration end point the precipitate is produced. This precipitate will be colored:
a. Blue
b. Yellow
c. Brown
d. Green
e. Red

518. When determining oxidizing agents by means of iodometry in the presence of starch the following phenomenon can be observed at the titration end point:
a. Green coloring of solution disappears
b. White precipitate occurs
c. Red coloring appears
d. Green coloring of precipitate appears
e. Blue coloring disappears

519. To obtain exotoxins of some microorganisms, these microorganisms are inoculated into liquid nutrient medium, where microbial cultivation occurs and toxins are produced. At a certain stage it is necessary to remove themicrobial cells from the medium, that is, to separate the toxins from microbes. What method should be applied in this case?
a. Boiling
b. Ultraviolet irradiation
c. Disinfectants (chloramine)
d. Bacteria-excluding filters
e. Autoclaving

520. A plant producing essential oil has square stem, bilabiate corolla, coenobium fruit. These features are characteristic of:
a. Polygonaceae
b. Papaveraceae
c. Lamiaceae
d. Solanaceae
e. Scrophulariaceae

521. A plant under investigation has compound uniform monopodium inflorescence - compound umbel. What plant is it characteristic of?
a. Allium cepa
b. Rosa canina
c. Centaurea cyanus
d. Anethum graveolens
e. Sorbus aucuparia

522. During field practice a student was tasked with making a morphological collection of coenocarpous fruits. What type of fruit belongs to this group?
a. Aggregate-accessory fruit
b. Cynarodium
c. Drupe

d. Hesperidium
e. Fragaria

523. A patient with gingivitis was prescribed oral cavity irrigation with 0,02% potassium permanganate solution. What group of antiseptics does this drug belong to?
a. Detergents
b. Dyes
c. Oxidants
d. Alcohols
e. Nitrofurans

524. To relieve dry cough a patient with bronchitis was prescribed a drug that is an alkaloid of yellow horned-poppy. Name this drug:
a. Codterpin
b. Glaucine hydrochloride
c. Libexin (Prenoxdiazine)
d. Codeine phosphate
e. Oxeladin

525. Hydrochloric acid was added into the solution under investigation. The resulting precipitate was filtered, then this filter cake was processed with hot water; after the filtrate cooled, KI solution was added into it. What cation was present in the solution, if the precipitate was colored yellow?
a. Ag+
b. Ca2+
c. Ba2+
d. Pb2+
e. Hg2+

526. When cations are divided into analytical groups according to the acidbase classification, group reagents can be acids or bases.What acids can be used as group reagents?
a. HClO4
b. H2CO3
c. HNO3, CH3COOH
d. H3PO4, H2C2O4
e. HCl, H2SO4

527. Main process of ammonia neutralization occurs in the liver. Arginine decomposition reaction that produces urea as a result is catalyzed with arginase. What group of enzymes does arginase belong to?
a. Transferases
b. Isomerases
c. Synthetases
d. Oxidoreductases
e. Hydrolases

528. Connection between plant cell protoplasts and their metabolic function is provided by thin cytoplasmic threads that pass through pores in the cell walls. Name these threads:
a. Cytoskeleton
b. Plasmodesma
c. Microtubules
d. Fibrils
e. Microfilaments

529. On autopsy there are numerous suppurative foci within many of the internal organs. What pathological process is it characteristic of?
a. Bacteriemia
b. Toxemia
c. Septicemia

d. Sepsis
e. Septicopyemia

530. Isotonicity is required of infusion solutions. What phenomenon occurs when a hypertensive solution is introduced into blood plasma?
a. Hemolysis
b. Osmosis
c. Plasmolysis
d. Denaturation
e. Thixotropy

531. The third analitycal group of cations (acid-base classification) includes Ca2+, Sr2+, Ba2+. What acid can function as a precipitator agent (group reagent) for these cations?
a. H2SO4
b. HCl
c. HClO4
d. CH3COOH
e. HNO3

532. During routine preventive examination the local pediatrician noticed a boy of short stature. Mental development of the child corresponds with his age. What endocrine disorder is it?
a. Pituitary nanism
b. Acromegalia
c. Rickets
d. Gigantism
e. Cretinism

533. Eicosanoids synthesis begins with freeing polyene acids from membrane phospholipids by means of a specific phospholipase. Name this enzyme:
a. Protein kinase
b. Arginase
c. Cyclooxygenase
d. Phospholipase C
e. Phospholipase A2

534. Thermal analysis is used in pharmacy to identify drugs and determine drug purity. What coordinates are necessary to build a cooling curve?
a. Volume-time
b. Temperature-volume
c. Pressure-time
d. Volume-temperature
e. Temperature-time

535. Both scientific and folk medicine uses medicinal plant Glycyrrhiza glabra L.What part of the plant is harvested?
a. Roots and rhizomes
b. Inflorescence
c. Seeds
d. Grass
e. Foliage

536. Choose the formula of nonionic surfactant among those listed below:
a. C6H13NH2COONa
b. C2H5NH2 × HCl
c. C15H31COONa
d. C11H23OSO3Na
e. CH3(OCH2CH2)10OH

537. A pregnant woman was diagnosed with vaginal dysbacteriosis. What drug should be prescribed

in this case?
a. Antibiotic
b. Interferon
c. Polyvitamins
d. Probiotic
e. Bacteriophage

538. A patient has been receiving Theophylline (inhibitor of cyclic adenosine monophosphate phosphodiesterase) for a week. What hormone can increase its action due to such treatment and cause hyperglycemia?
a. Estradiol
b. Glucagon
c. Aldosterone
d. Testosterone
e. Insulin

539. Reaction of sodium ions with potassium hexahydroxoantimonate (V) in neutral medium produces precipitate. Specify the color of this precipitate:
a. Green
b. Blue
c. Red
d. Yellow
e. White

540. .Reaction with potassium permanganate is used to detect reducing anions. Specify the anion that decolorizes potassium permanganate:
a. Arsenate
b. Sulfite
c. Tetraborate
d. Carbonate
e. Sulfate

541. A 25-year-old-patient with the II degree thermal burns came to a doctor. Objectively: there are large blisters on the upper limbs; the blisters are filled with clear exudate containing mostly water and albumines with isolated leukocytes. Name the type of the exudate:
a. Hemorrhagic
b. Serous
c. Fibrinous
d. Catarrhal (mucous)
e. Purulent

542. Rhizome of an Asteraceae family species is polycephalous, succulent, has lysigenous cavities, accumulates inulin. Such underground organ is characterisic of:
a. Digitalis grandiflora
b. Hyoscyamus niger
c. Inula helenium
d. Sorbus aucuparia
e. Helianthus annuus

543. Osmotic pressure is an important characteristic of biological fluids. Semipermeable membranes are necessary for penetration of solvent molecules. What substance CANNOT be used as a semipermeable membrane?
a. Glass
b. Collodion film
c. Gelatine
d. Parchment
e. Biological membrane

544. Specify the substance that can be determined by means of polarimetry:
a. Benzene
b. Glucose
c. Sulfuric acid
d. This method will suffice for any substance
e. Sodium chloride

545. A local general practitioner recommends taking interferon for influenza prevention. What is the mechanism of action of this drug?
a. Blocks virus protein synthesis
b. Inhibits virion exit from cells
c. Disrupts the process of virus assembly
d. Prevents adsorption of virus in cell receptors
e. Blocks virus stripping

546. What cation can be detected with Chugaiev's agent (Dimethylglyoxime)?
a. K+
b. Ca2+
c. Ni2+
d. Mn2+
e. Co2+

547. A solution of hydrogen peroxide in an acid medium was added into investigated solution, leading to blue coloring of the resulting solution. This analytical effect indicates the presence of the following anions:
a. Cl?
b. Cr2O72?
c. C2O42?
d. MnO4?
e. NO3?

548. A patient presents with hypoxia. What metabolic process activates when oxygen supply is insufficient?
a. Tricarboxylic acid cycle
b. Anaerobic glycolysis
c. Pentose-phosphate pathway
d. Urea cycle
e. Oxidative decarboxylation of keto acids

549. A child had been administered antidiphtheric serum. What resistance was formed in the child?
a. Physiological
b. Passive
c. Primary
d. Active
e. Pathologic

550. A patient with brain edema presents with respiration that is characterized by periods of several respiratory movements of equal amplitude alternating with periods of apnea. What pathologic respiration is it characteristic of?
a. Kussmaul's respiration
b. Biot's respiration
c. Apneustic respiration
d. Gasping respiration
e. Cheyne-Stokes' respiration

551. A patient in the state of ketoacidotic coma presents with loud rapid respiration: labored expiration with tension of expiratory muscles occurs after deep inspiration. Name the type of pathologic respiration:

a. Stenotic
b. Biot’s
c. Cheyne-Stokes’
d. Gasping
e. Kussmaul’s

552. In a nursery-garden some medicinal plants developed signs of a disease: there are yellow spots and necrotic foci on the leaves. Sap of the diseased plants remained infectious even after passing through a bacteria-excluding filter. No microorganisms growth was detected on the nutrient medium.What microorganisms could be the cause of this disease?
a. Ray fungi
b. Fungi
c. Viruses
d. Bacteria
e. Mycoplasma

553. Bark of a thornless xylophyte of the Rhamnaceae family has laxative effect. Name this plant:
a. Aronia melanocarpa
b. Rubus idaeus
c. Crataegus sanguinea
d. Frangula alnus
e. Hippophaë rhamnoides

554. Different structures of a bacterial cell perform different functions. What dispensable component of a cell ensures its survival within hostile environment?
a. Flagella
b. Cilia
c. Inclusions
d. Spores
e. Capsule

555. Total content of chloride, bromide, and iodide ions in the investigated solution can be quantitatively determined with the following titrant:
a. Sodium nitrite solution
b. Silver nitrate solution
c. Sodium thiosulfate solution
d. Potassium dichromate solution
e. Potassium permanganate solution

556. Specify the reaction product of complete aniline hydrogenation:
a.
b.
c.
d.
e.

557. Name the isomer of diethyl ether functional group: CH3 ? CH2 ? O ? CH2 ? CH3:
a. Ethanol
b. Ethyl acetate
c. Dimethyl ether
d. Butanol
e. Butanal

558. .What substance can be identified with aqueous solution of FeCl3?
a.
b.
c.
d.

e.

559. What reaction proves that phenol has acidic properties?

a.

b.

c.

d.

e.

560. Gravimetry (precipitation method) is used for quantitative determination of sulfates in potable water. What substance should be used as precipitator for sulfates?

a. KCl

b. NaCl

c. NH_4NO_3

d. $BaCl_2$

e. $MgCl_2$

561. In 9 days after administration of a therapeutic serum the patient developed urticaria, itching, edemas, and lymph nodes enlargement.What type of allergic reaction has occurred in the patient?

a. Cytotoxic

b. Stimulating

c. Cellular

d. Immune complex

e. Anaphylactic

562. .Which of the listed compounds is an alpha-amino acid?

a.

b.

c.

d.

e.

563. Exudation is characteristic of inflammation. What factors cause exudation and local edema of the inflamed area?

a. Leukocyte adhesion to endothelial cells

b. Decreased permeability of vessel wall

c. Hyperglycemia

d. Ischemia

e. Increased permeability of vessel wall

564. For cardiovascular disease prevention the patient was recommended to take vitamin F. What is the chemical nature of this vitamin?

a. Carotin derivative

b. Complex of polyunsaturated fatty acids

c. Polysaccharide complex

d. Cholesterol derivative

e. Amino acids complex

565. Wetting occurs when a drop of a liquid comes into contact with the surface of a solid substance. The degree of wetting is measured through:

a. Drop size

b. Work of adhesion

c. Drop density

d. Surface tension

e. Contact angle

566. A perennial plant has white flower heads grouped in compound corymbs and bipinnatisected or tripinnatisected leaves. Name this plant:

a. Melilotus officinalis

b. Phaseolus vulgaris
c. Taraxacum officinale
d. Achillea millefolium
e. Potentilla erecta

567. What organic compounds are produced in the result of intramolecular dehydration of monohydric alcohols?
a. Alkenes
b. Aldehydes
c. Arenes
d. Alkanes
e. Esters

568. A group of children in the kindergarten (6-year-olds) received Mantoux test; 15 children presented with negative results. What measures should be taken towards these children?
a. Referral for fluorography
b. BCG vaccination
c. Isolation
d. Tuberculosis antitoxin
e. Repeat the test

569. Increased concentration of active oxygen forms is a mechanism of pathogenesis in a number of diseases. To prevent this process, antioxidants are prescribed. Select an antioxidant from the list below:
a. Glicerol
b. Alpha-tocopherol
c. Calciferol
d. Glucose
e. Cobalamine

570. During excursion into a conifer forest the students noticed that bilberry (Vaccinium myrtillus) stems are lignified only partially in their lower part, the upper part of the stem retains the form of caulis. Therefore, this plant can be classified as:
a. Perennial grass
b. Tree
c. Annual grass
d. Liana
e. Suffrutex

571. Antibiotics derived from various species of actinomycetes are widely used in medical practice. Point out these drugs among those listed below:
a. Chloreline, arenarinum
b. Lysozyme, erytrinum
c. Penicillin, cephalosporin, griseofulvin
d. Polymyxin, bacitracin
e. Aminoglycosides (streptomycin, monomycin)

572. In a human body there occur numerous reactions of direct interaction between substrate and molecular oxygen. What enzyme catalyzes attachment of two oxygen atoms to the substrate?
a. Catalase
b. Superoxide dismutase
c. Glutathione reductase
d. Dioxygenase
e. Monooxygenase

573. Seeds of rye, corn, and other crops have small corymb-shaped cotyledon and accumulate nutrients in the:
a. Shell

b. Perisperm
c. Endosperm
d. Gemmule
e. Embryo root

574. A 55-year-old man came to a doctor with complaints of acute pain in his big toes.Meat and wine remain permanently in his diet. The doctor suspects gout. What substance must be measured in the patient's blood to confirm this diagnosis?
a. Ketone bodies
b. Uric acid
c. Lactate
d. Urea
e. Bilirubin

575. Isotonic glucose solution is widely used as a solvent or infuson medium for introduction of various drugs.What mass fraction is characteristic of this solution?
a. 15%
b. 10%
c. 5%
d. 20%
e. 1%

576. Name the process of cell membrane saturation with a fat-like substance suberin:
a. Suberization
b. Mineralisation
c. Sliming
d. Cutinization
e. Lignification

577. A man has been suffering from rheumatoid arthritis for 10 years. Due to its exacerbation he had been taking acetylsalicylic acid and prednisolone. The patient complains of stomachache, eructation, nausea, sensation of full epigastrium, and meteorism. On gastroscopy there was an erosion (0,5x0,5 cm) of gastric mucosa detected. What is the cause of gastric mucosa defect development?
a. Age-related changes of mucosa
b. Prolonged hypersthenia of gastric muscles
c. Immune-mediated destruction of gastric mucosa
d. Dysbacteriosis development
e. Prolonged taking of aspirin and hormones

578. Treatment of a number of pathologic changes in human body is based on the peptization process, particularly disintegration of thrombi within blood vessels. The most important condition for efficient peptization can be determined as:
a. Timely introduction of anticoagulant
b. Ultrasound effect
c. Heating
d. Shaking
e. Introduction of excessive solvent

579. The patient's large-focal myocardial infarction is complicated with pulmonary edema. What disturbance of cardiohemodynamics contributed to the pulmonary edema development?
a. Acute right ventricular failure
b. Cardiogenic shock
c. Reperfusion syndrome
d. Acute left ventricular failure
e. Autoimmune myocarditis

580. The fruit is a thorned many-seeded capsule that opens into four flaps when ripe. It is characteristic of:

a. Papaver somniferum
b. Digitalis purpurea
c. Linum usitatissimum
d. Datura stramonium
e. Hyoscyamus niger

581. An interhospital pharmacy received a short-acting narcotic analgesic that is 100 times more active than morphine. Name this drug:
a. Fentanyl
b. Naloxone
c. Ketanov (Ketorolac)
d. Analgin (Metamizole)
e. Naltrexone

582. Hemoglobin break-up begins in the cells of reticuloendothelial system. What enzyme catalyzes the reduction reaction of biliverdine into bilirubin?
a. Beta-glucuronidase
b. Heme oxygenase
c. Hexokinase
d. Biliverdine reductase
e. Xanthine oxidase

583. To stop diarrhea the doctor prescribed a drug that affects opiate receptors of the intestine and decreases its peristalsis. Name this drug:
a. Tetracycline
b. Loperamide
c. Levorin
d. Heparin
e. Voltaren (Diclofenac)

584. What formula corresponds with alpha-nitropyrole?
a.
b.
c.
d.
e.

585. Essential oils are used both in pharmaceutical and cosmetic industry. To extract essential oils from herbal raw material the following technology is used:
a. Colorimetry
b. Calorimetry
c. Steam distillation
d. Potentiometry
e. Conductometry

586. Specify the mechanism of the given reaction:
a. AN (nucleophilic attachment)
b. SN (nucleophilic substitution)
c. E (elimination)
d. SR (radical substitution)
e. SE (electrophilic substitution)

587. What type of bonds participates in creation of both linear and cyclic carboxylic acid associates in the form of dimers?
a. Polar covalent bonds
b. Ionic bonds
c. Hydrogen bonds
d. Nonpolar covalent bonds

e. Donor-acceptor bonds

588. Specify the functional group of isoniazide (an isonicotinic acid derivative) molecule:
a. Pyridine heterocyclic group
b. Ester group
c. Amide group
d. Carboxyl group
e. Hydrazide group

589. What compound is synthesized by means of beta-picoline oxidation?
a. Uric acid
b. Benzoic acid
c. Nicotinic acid
d. Barbituric acid
e. Ascorbic acid

590. Specify quinoline among the compounds given below:
a.
b.
c.
d.
e.

591. Name the substance B in the following transformation:
a. Propanone
b. Ethanal
c. Ethanol
d. Propanal
e. Acetic acid

592. What substance produces ketone, when oxidized with potassium permanganate?
a. CH3 ? CH ? CH2OH
b.
c.
d.
e. CH3 ? CH2OH

593. Among the given isomer pairs choose the position isomers of the functional group:
a.
b.
c.
d.
e.

594. Among the given substances choose the one that is used for oxidation of organic compounds:
a. CH3 ? CH3
b. HCl
c. NH2 ? NH2
d. KMnO4
e. NaOH

595. What substance will be produced as the result of the following reaction:
a. C6H6
b. C6H5OH
c. C6H5J
d. C6H5—Cl
e. C6H5OK

596. What reagent can simultaneously detect aldehyde group and glycol fragment in a glucose

molecule?

a. $AlCl_3$

b. Br_2

c. $Cu(OH)_2$

d. $FeCl_3$

e. $KMnO_4$