1. When a mixture of electrolytes is added into a sol, one of them reduces the effect of another. Name this phenomenon:
a. Additivity
b. Antagonism
c. Synergism
d. Rheopexy
e. Phoresis

2. Hemoglobin catabolism results in release of iron that is transported to the bone marrow by a certain transfer protein and used again for the synthesis of hemoglobin. Specify this transfer protein:
a. Transferrin (siderophilin)
b. Ceruloplasmin
c. Albumin
d. Haptoglobin
e. Transcobalamin

3. What chemotherapeutic agent is a drug of choice for treatment of herpes?
a. Chingamin
b. Doxycycline hydrochloride
c. Acyclovir
d. Metronidazole
e. Rifampicin

4. A man with Trichomonas urethritis was prescribed an imidazole derivative for treatment. Name this drug:
a. Metronidazole
b. Furacilin (Nitrofural)
c. Nitroxoline
d. Azithromycin
e. Ciprofloxacin

5. What type of gynoecium has several or many free carpels?
a. Apocarpous
b. Monocarpous
c. Paracarpous
d. Cenocarpous
e. Syncarpous

6. In the process of systematic analysis of a cation mixture, iron(III) cations can be determined using the fractional method. What reagent is used for this purpose?
a. Potassium chloride
b. Hydrochloric acid
c. Sodium dihydrogen phosphate
d. Potassium hexacyanoferrate(II)
e. Nitric acid

7. What factor of those named below is leading in developing symptom group characteristic of altitude sickness?
a. Heavy physical exertion
b. Decrease of oxygen partial pressure in air
c. Solar radiation
d. Daytime and nighttime temperature difference
e. Speed of ascent

8. What antibiotic is used for treatment of syphilis?
a. Benzylpenicillin
b. Amphotericin
c. Streptomycin
d. Kanamycin

e. Nystatin

9. Velamen is a specific multilayer absorbent tissue that often is photosynthetic. It provides protection against mechanical damage and water loss. It is formed on the roots of the following type of plants:
a. Mesophytes
b. Xerophytes
c. Hydrophytes
d. Epiphytes
e. Hygrophytes

10. A patient undergoes chemotherapy with 5-fluorouracil that is a competitive inhibitor of thymidilate synthase. What process is inhibited by this drug?
a. Glucose synthesis
b. Purine nucleotides salvage
c. Purine nucleotides disintegration
d. Thymidine monophosphate synthesis
e. Adenosine triphosphate synthesis

11. A 32-year-old man with suspected alkaloid poisoning was brought into the admission room of an emergency hospital. What should be used for gastric lavage in this case?
a. Potassium permanganate
b. Furacilin (Nitrofural)
c. Sodium chloride
d. Unithiol (Dimercaptopropansulfonate)
e. Magnesium sulfate

12. A child has been hospitalised with scalded skin syndrome. Staphylococcus aureus was detected in blisters. What virulence factor causes exfoliation and necrosis of epidermis?
a. Exfoliative toxin
b. Hemolysin
c. Enterotoxin
d. Hyaluronidase
e. Toxic shock syndrome toxin

13. One of the biological functions performed by glycoproteins in the body is a regulatory (hormone) function. What hormone is a glycoprotein based on its chemical nature?
a. Glucagon
b. Cortisol
c. Insulin
d. Aldosterone
e. Thyrotropin

14. To disinfect a burn surface, an antiseptic was used. When interacting with tissues, this antiseptic releases atomic oxygen and manganese dioxide. What antiseptic was used in this case?
a. Ethyl alcohol
b. Iodine alcohol solution
c. Brilliant green
d. Potassium permanganate
e. Hydrogen peroxide

15. During a morphological description of Salvia sclarea, students noticed its bright bracts. They serve to attract pollinating insects and are a modification of a:
a. Shoot
b. Leaf
c. Receptacle
d. Androecium
e. Pedicel

16. What medicine increases the risk of toxic effects when taken along with gentamicin?

a. Furosemide
b. Erythromycin
c. Methylprednisolone
d. Caffeine
e. Penicillin

17. What compound is obtained as the result of propylene interacting with bromine CH_3-CH=CH_2 + Br_2longrightarrow?
a. 1,1-Dibromopropane
b. 1,2-Dibromopropene
c. 1,2-Dibromopropane
d. -
e. 1,3-Dibromopropane

18. With which of the following compounds does propane react under the given conditions?
a. AlCl_3
b. SO_2 + Cl_2, in the dark
c. Br_2, in the dark, 20^oC
d. Diluted H_2SO_4, 20^oC
e. Br_2, in the light, 20^oC

19. To induce diabetes mellitus in a rabbit, beta-cells of pancreatic islets (islets of Langerhans) were selectively damaged with alloxan. What method of diabetes induction was used in this experiment?
a. Shutdown
b. Irritation
c. Stimulation
d. Introduction of enzymes, hormones
e. Isolated organs

20. In microbiology, the Gram method is the main method for bacteria differentiation by means of staining. In this method, bacteria differentiation into Gram-positive and Gram-negative ones is based on their:
a. Presence of ribosomes
b. Cell size
c. Chemical composition of the capsule
d. Cell wall structure
e. Cytoplasmic membrane structure

21. After a traffic accident the driver presents with increased blood glucose. What mechanism leads to hyperglycemia in this case?
a. Increased production of somatotropic hormone
b. Decreased production of glucagon
c. Decreased production of insulin
d. Decreased tone of parasympathetic nervous system
e. Sympathoadrenal system activation

22. Moisture content of thermally unstable preparations can be determined by:
a. Karl Fischer titration
b. Iodometry
c. Permanganatometry
d. Nitritometry
e. Bromatometry

23. The following ion has the highest coagulation ability for iron hydroxide sol with positively charged granules:
a. Calcium
b. Chloride
c. Sodium
d. Sulfate

e. Nitrate

24. Select a Brassicaceae family plant that contains glycosides similar in action to those obtained from foxglove:
a. Primula officinalis
b. Urtica dioica
c. Polygonum aviculare
d. Arctostaphylos uva-ursi
e. Erysimum canescens

25. What has an effect on the coagulating action of a coagulant ion, according to the Schulze-Hardy rule?
a. Hydration ability
b. Ion charge
c. Adsorbability
d. Polarization
e. Ion size

26. What integumentary tissue of roots consists of cells with thin cellulose membranes and outgrowths - root hairs?
a. Periderm
b. Periblem
c. Rhizoderm (epiblem)
d. Pleroma
e. Phelloderm

27. The pharmacy of a tuberculosis clinic has received tuberculin. What is the purpose of this substance?
a. Specific therapy of tuberculosis
b. Specific prevention of tuberculosis
c. Phagotyping of mycobacteria
d. Allergic diagnostics of tuberculosis
e. Serological diagnostics of tuberculosis

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

29. What method can be used to determine the moisture content in thermally unstable preparations?
a. Nitritometric method
b. Permanganatometric method
c. Bromatometric method
d. Iodometric method
e. Non-aqueous titration using the Fischer's method

30. 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. Thermophilic
c. Prototrophic
d. Acid-fast
e. Anaerobic

31. Proteins carry out various extremely important functions in the human body. Actin and myosin perform the following function:

a. Receptor
b. Cogenetic
c. Transport
d. Regulatory
e. Contractile (motor)

32. The following is used to determine the titrant volume in the process of titrimetric analysis:
a. Measuring flasks
b. Cylinders
c. Measuring glasses
d. Measuring tubes
e. Burettes

33. A 12-year-old boy is of short stature, but his mental development corresponds with that of his age group. What hormone deficiency is the most likely to cause this pathology?
a. Somatotropin
b. Vasopressin
c. Oxytocin
d. Insulin
e. Adrenaline

34. Microscopy of a vaginal discharge detects round and oval Gram-positive cells that gemmate and form a pseudomycelium. What medicines must be recommended for treatment, if the diagnosis of candidiasis is confirmed?
a. Erythromycin, monomycin
b. Tetracycline, oleandomycin
c. Sulgin (sulfaguanidine), phthalazol (phthalylsulfathiazole)
d. Clotrimazole, nystatin
e. Penicillin, streptomycin

35. A patient with essential hypertension was prescribed a diuretic as a part of complex therapy. This diuretic caused hypokalemia in the patient. Name this diuretic:
a. Allopurinol
b. Hydrochlorothiazide
c. Spironolactone
d. Amiloride
e. Triamterene

36. Mother of a 10-year-old child came to the pharmacy to obtain a drug for prevention of upper respiratory tract infections. What drug would be recommended by the dispensing chemist?
a. Benzoteph
b. Interferon
c. Doxorubicin
d. Carvedilol
e. Tetracycline

37. Amperometric titration is used in analysis of some pharmaceutical preparations. The amperometric titration method is based on the following:
a. Measuring the cell voltage during the titration
b. Measuring the potential difference of the electrodes during the titration process
c. Ion exchange between the anionite and analyte solution
d. Ion exchange between the analyte solution and cationite
e. Determining the equivalence point by a sharp change in the diffusion current during the titration process

38. A patient has thyrotoxicosis. What drug should be prescribed to this patient to suppress the synthesis of thyroid hormones?
a. Thyroidin
b. Parathyroidin

c. L-thyroxine
d. Mercazolil (Thiamazole)
e. Antistrumin (Potassium iodide)

39. What feature of a leaf is characteristic of Poaceae?
a. Leaf sheath
b. Stipules
c. Petiole
d. Ochrea
e. Leaf blade

40. The study of home-made canned vegetables revealed growth of microorganisms with the shape that resembled a tennis racket after inoculation on the Kitt-Tarozzi medium. What disease can be caused by these pathogens?
a. Botulism
b. Cholera
c. Salmonellosis
d. Shigellosis
e. Escherichiosis

41. Under what condition is the solubilization process possible?
a. Surfactant concentration in the solution is arbitrary
b. Surfactant is in the form of micelles
c. Surfactant is in the form of molecules
d. Surfactant was comminuted before the dissolution
e. Solute has high solubility in a certain solvent

42. What compound can be classified as a condensed arene?
a. Diphenylmethane
b. Naphthalene
c. Triphenylmethane
d. Benzene
e. Biphenyl

43. While on a tour, the students have been collecting summer shoots of Equiseti arvensis that were hard to the touch. What type of the outer shell is characteristic of the epidermal cells of this plant?
a. Slimified
b. Mineralized
c. Lignified
d. Cutinized
e. Suberinized

44. Microcrystalloscopy reaction for detecting potassium ions is the following one:
a. With sodium tetraphenylborate
b. With sodium lead (II) hexanitrocuprate
c. With sodium hydrotartrate
d. Flame colour test
e. With sodium hexanitrocobaltate

45. In the patient's blood, increased activity of AST, LDH1, LDH2, and CPK was detected. In what organ is a pathological process possible in this case?
a. Skeletal muscles
b. Adrenal glands
c. Kidneys
d. Heart muscle
e. Liver

46. Name the method of sorption detoxification of the body, in which the adsorption of toxic substances occurs when the sorbent passes through the digestive system?

a. Lymphosorption
b. Hemosorption
c. Liquorosorption
d. Enterosorption
e. Contact therapy

47. A solution being analyzed contains calcium chloride and sodium bromide. What solution must be added to the solution being analyzed, to identify the calcium ions?
a. Ammonium oxalate
b. Barium chloride
c. Potassium iodide
d. Ammonium acetate
e. Sodium chloride

48. Pastes are used in medicine to treat skin diseases. What type of disperse systems are they?
a. Powders
b. Foams
c. Aerosols
d. Emulsions
e. Suspensions

49. A patient has been hospitalised with diagnosis of diabetes mellitus I type. Decreased rate of oxaloacetate forming is one of the metabolic changes present in the patient. What metabolic process is disrupted as a result?
a. Cholesterol synthesis
b. Urea synthesis
c. Citric acid cycle
d. Glycolysis
e. Glycogen mobilization

50. Complex biological systems contain components such as electrolytes, non-electrolytes, and proteins that together create osmotic pressure. What part of osmotic pressure is formed primarily by proteins?
a. Cellular pressure
b. -
c. Biological pressure
d. Internal pressure
e. Oncotic pressure

51. Corn stalks typically have adventitious roots in their lower parts. These roots combine the functions of:
a. Nutrition and respiration
b. Nutrition and support
c. Respiration and assimilation
d. Retraction or contraction
e. Assimilation and absorption

52. A patient has pulmonary edema. What drug must be prescribed in this case to reduce the volume of circulating blood?
a. Nitroglycerin
b. Aminazine (Chlorpromazine)
c. Magnesium sulfate
d. Furosemide
e. Metoprolol

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

d. Saccharose
e. D-glucose

54. A patient with acute renal failure in the polyuria stage has azotemia that not only did not decrease, but continues to deteriorate. What caused polyuria in this case?
a. Increasd filtration
b. Decreased reabsorption
c. Increased secretion
d. Decreased filtration
e. Increased reabsorption

55. A patient was admitted to a hospital in a state of hypoglycemic coma. It occurs at the following level of blood glucose:
a. 4,0 mmol/l
b. 2,5 mmol/l or less
c. 5,5 mmol/l
d. 4,5 mmol/l
e. 3,3 mmol/l

56. In the process of coagulation by mixtures of different electrolytes, they seem to counteract each other's effect. Name this phenomenon:
a. Mutual coagulation
b. Sedimentation
c. Antagonism
d. Additivity
e. Synergism

57. Short lignified stem is characteristic of the Allium cepa genera. It is a part of modified sprout that is called:
a. Tendril
b. Rhizome
c. Tuber
d. Bulb
e. Phylloclade

58. After examination the patient was diagnosed with tick-borne encephalitis. What route of transmission is characteristic of this disease?
a. Airborne droplet transmission
b. Vertical transmission
c. Parenteral transmission
d. Fecal-oral transmission
e. Vector-borne transmission

59. Serology is the main method of congenital toxoplasmosis diagnostics. What reaction is used to diagnose this pathology?
a. Agglutination
b. Precipitation
c. Complement fixation
d. Bacteriolysis
e. Neutralization

60. Lipids are a group of water-insoluble substances of various structure that carry out a number of functions. What lipids form a protective layer over skin, fur, or feathers of animals?
a. Waxes
b. Cholesterol esters
c. Triglycerides
d. Glycolipids
e. Phospholipids

61. A patient who was receiving an indirect anticoagulant, warfarin, has taken acetylsalicylic acid to treat elevated body temperature. This combination of drugs is dangerous due to increased risk of:
a. Dysbiosis
b. Hemorrhage
c. Osteoporosis
d. Cardiotoxicity
e. Neurotoxicity

62. Foam aerosols are used for burn treatment. What type of dispersed systems are foams?
a. Gas-liquid
b. Liquid-solid
c. Liquid-liquid
d. Solid-solid
e. Solid-liquid

63. Name the serums made from blood donated by volunteers or reconvalescent donors:
a. Homologous
b. Corpuscular
c. Heterologous
d. Attenuated
e. Autoimmune

64. Amino acids take part in methylation reactions during the synthesis of a number of bioactive substances - adrenaline, melatonin, phosphatidylcholine, creatine. For the synthesis of these compounds, the active form of a certain amino acid is used. Name this amino acid.
a. Alanine
b. Methionine
c. Valine
d. Phenylalanine
e. Threonine

65. A laboratory has received a sample of copper(II) sulfate pentahydrate. Choose the method for quantification of copper(II) in copper sulfate.
a. Permanganatometry
b. Argentometry
c. Alkalimetry
d. Iodometry
e. Acidimetry

66. What is the name of the phenomenon when one drug enhances the effect of another?
a. Tachyphylaxis
b. Sensitization
c. Antagonism
d. Withdrawal
e. Synergism

67. A sailor, who had been at sea for 10 months, developed bleeding gums and mobility and loss of healthy teeth. After an examination he was diagnosed with scurvy. What vitamin is deficient in this case, causing this disease?
a. Vitamin E
b. Nicotinic acid
c. Folic acid
d. Vitamin D
e. Vitamin C

68. What titrimetric method of analysis requires the use of both external and internal indicators?
a. Permanganatometry
b. Complexometric titration
c. Nitritometry

d. Alkalimetry
e. Argentometry

69. What process occurs as a result of electrolytes effect on a solution of a high-molecular compound?
a. Thixotropy
b. Solvation
c. Coacervation
d. Syneresis
e. Salting out

70. Bacterial enzymes typically exhibit a high specificity of their action. In practice, this feature of bacterial enzymes is used for:
a. Bacteria identification
b. Bacteria phage typing
c. Bacteria serotyping
d. Immunoglobulin production
e. Bacteria cultivation

71. How is the radial type of leaf blade different from the dorsiventral type?
a. It has stomata
b. It has trichomes
c. It has hypodermis
d. It has spongy parenchyma
e. It has a vascular bundle

72. A patient has developed intestinal disbacteriosis after his long-term taking of antibiotics. What drugs should be prescribed to restore microflora up to normal amount?
a. Antifungal agents
b. Interferon
c. Cephalosporines
d. Eubiotics
e. Sulfanilamides

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

74. Name the plants that have adapted to growing in an arid environment and developed a number of mechanisms to reduce the moisture loss.
a. Succulents
b. Hydrophytes
c. Xerophytes
d. Hygrophytes
e. Mesophytes

75. Microbial survival within environment is facilitated by spore formation. What microorganisms of those listed below are spore formers:
a. Peptococci
b. Clostridia
c. Peptostreptococci
d. Staphylococci
e. Bacteroides

76. A 5-year-old boy has stomachache, diarrhea with mucus and blood admixtures in the stool, and a fever of 38.0^oC) Bacteriological stool test detected Shigella flexneri. What disease is it?

a. Nonspecific ulcerative colitis
b. Yersiniosis
c. Salmonellosis
d. Dysentery
e. Typhoid fever

77. In case of excessive consumption of carbohydrates, insulin stimulates the transformation of carbohydrates into lipids in the cells of adipose tissue. What process is involved in this transformation?
a. Heme synthesis
b. Gluconeogenesis
c. Lipolysis
d. Synthesis of higher fatty acids
e. Uric acid synthesis

78. A doctor prescribed nitrazepam to a patient complaining of insomnia. This drug has a hypnotic effect, because it interacts with certain receptors. Name these receptors.
a. Serotonin receptors
b. Adrenoceptors
c. Histamine receptors
d. Cholinergic receptors
e. Benzodiazepine receptors

79. Transformation C_2H_4 (alkene) longrightarrow C_2H_6 (alkane) occurs during the following reaction:
a. Dehydration
b. Dehydrogenation
c. Hydrogenation
d. Dimerization
e. Hydration

80. A gastric tea contains small oval brown lignified cone-shaped plant parts up to 1.5 cm in length that can be identified as:
a. Aggregate fruits of alnus
b. Larch cones
c. Platycladus orientalis cones
d. Cypress cones
e. Berry-like juniper cones

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

82. Friedel-Crafts alkylation takes place in the presence of catalysts - Lewis acids. What compounds are included in the list of Lewis acids?
a. KOH, CaO
b. AlCl_3, FeBr_3
c. KMnO_4, Na_2S_2O_3
d. H_2O, H_2O_2
e. H_2SO_4, HNO_3

83. What thermodynamic potential is the criterion for the direction of a spontaneous process at constant volume and temperature?
a. Entropy

b. Gibbs energy
c. Chemical potential
d. Helmholtz energy
e. Enthalpy

84. To determine the mass-volume fraction of ammonia in the solution, neutralization back titration was used. Specify the pair of titrants necessary in this case:
a. HCl, NaOH
b. HCl, AgNO_3
c. HCl, Hg(NO_3)_2
d. CH_3COOH, KOH
e. HCl, Hg_2(NO_3)_2

85. Lipid digestion requires lipases, emulsifiers, and a slightly alkaline pH. What segment of the gastrointestinal tract provides these conditions?
a. Stomach
b. Esophagus
c. Duodenum
d. Large intestine
e. Oral cavity

86. What drug should a doctor choose for substitution therapy after surgical removal of thyroid gland?
a. Insulin
b. Mercazolil (Thiamazole)
c. Prednisolone
d. L-thyroxine
e. Parathyreoidine

87. A pharmaceutical manufacture produces a drug, that is an animal antibiotic. Point out this drug among those listed below:
a. Chloramphenicol
b. Novobiocin
c. Phaseolin
d. Gramicidin
e. Lysozyme

88. Name the process when a dissolved macromolecular compound is sedimented by adding electrolytes into the solution:
a. Jelly formation
b. Coacervation
c. Salting out
d. Flocculation
e. Denaturation

89. Name the phenomenon when one drug weakens the effect of another drug:
a. Tachyphylaxis
b. Sensitization
c. Antagonism
d. Tolerance
e. Potentiation

90. Morphologically the herbaceous plant being studied can be identified as Convallaria majalis. To confirm this conclusion additionally, a leaf of this plant was examined under the microscope and a search for the following crystalline inclusions was conducted:
a. Styloid crystals
b. Raphides
c. Crystal sand
d. Druse crystals
e. Single crystals

91. After a casual sexual contact, a 30-year-old man visited a hospital complaining of a painless ulcer with smooth edges on the head of his penis. What pathogen has caused the patient's disease in this case?

a. Treponema
b. Chlamydia
c. Ureaplasma
d. Neisseria
e. Mycoplasma

92. Which alkadiene of those listed below is a diene with cumulated double bonds?

a. $CH_2 = CH - CH = CH_2$
b. $CH_2 = CH - CH_2 - CH = CH_2$
c. $CH_3 - CH = CH - CH_2 - CH = CH_2$
d. $CH_2 = C = CH_2$
e. $CH_2 = CH - CH_2 - CH_2 - CH = CH_2$

93. During a surgery, tubocurarin chloride was used as a muscle relaxant. What antagonist should the patient be given to restore spontaneous breathing?

a. Benzohexonium (Hexamethonium)
b. Proserin (Neostigmine)
c. Dithylin (Suxamethonium)
d. Aethimizole (Methylamide)
e. Cytitone (Cytisine)

94. A female patient was prescribed loratadine to treat her allergic dermatitis caused by bee sting. What is the mechanism of the drug's antiallergic action?

a. Antiserotonin activity
b. Block of leukotriene D4 receptors
c. Inhibition of histamine H2 receptors
d. Inhibition of histamine H1 receptors
e. Decrease of leukotriene release

95. What is the generative reproductive organ of gymnosperms and angiosperms?

a. Macro- and microspores
b. Fruit
c. Strobilus
d. Flower
e. Seed

96. A patient with acute cardiac infarction was undergoing anticoagulant therapy with inhibitor of antithrombin III that prevents intravascular blood clotting. Name the compound with anticoagulating effect:

a. Chondroitin sulfate
b. Heparin
c. Hyaluronic acid
d. Tetracycline
e. Histamine

97. A bacillus was obtained from the patient's feces. The bacillus is comma-shaped, mobile, non-spore-forming, and has no capsule. On the solid alkaline medium it grows transparent colonies, on the alkaline peptone water it produces pale blue film in 6 hours. What causative agent can be suspected?

a. Shigella
b. Cholera vibrio
c. Salmonella
d. Proteus
e. Escherichia

98. Explain to a doctor, what drug has the effect, closest to acetylcysteine, and can be used as its

substitute, if acetylcysteine is not available in a pharmacy:

a. Ambroxol

b. Sodium bicarbonate

c. Sodium chloride

d. Codeine phosphate

e. Libexin (Prenoxdiazine)

99. In March, the children in a kindergarten were given a salad made from fresh cabbage stored in a cold cellar. Several hours later, many of these children developed signs of food poisoning. What microorganisms are the likely cause of poisoning in this case, considering the conditions in which they were reproducing?

a. Resident

b. Mesophiles

c. Thermophiles

d. Facultative

e. Psychrophiles

100. Presence of the pathogenic microorganisms in the air can be prognosticated according to the content of sanitary-indicative bacteria. Which bacteria indicate immediate epidemiologic danger?

a. Yeast fungi

b. Sarcinae

c. Micrococci

d. Mold fungi

e. Haemolytic streptococci

101. What Brassicaceae family plant has a cardiotonic effect?

a. Capsella bursa-pastoris

b. Adonis vernalis

c. Rheum tanguticum

d. Erysimum diffusum

e. Leonurus cardiaca

102. A patient with high risk of hemorrhages is recommended to take vicasol (menadione) by his physician. This drug is the structural analog of:

a. Vitamin B_5

b. Vitamin A

c. Vitamin K

d. Vitamin B_6

e. Vitamin B_12

103. A melliferous tree has heart-shaped leaves and dichasial cyme inflorescences with winged perianth. This plant is:

a. Tilia cordata

b. Aronia melanocarpa

c. Robinia pseudoacacia

d. Quercus robur

e. Aesculus hippocastanus

104. In iodometry, titrimetric quantitative analysis is used to measure the amount of iodine utilized for the oxidation of a reducing agent or released as a result of iodide oxidation. What salt is used to make an iodide solution for iodometry?

a. Magnesium iodide

b. Potassium iodide

c. Sodium iodide

d. Lithium iodide

e. Calcium iodide

105. To quantitatively determine Fe^3+ ions, a photometric reaction with sulfosalicylic acid was conducted. Photometric determination of the obtained solution requires measuring of the following:

a. Refractive index
b. Specific rotation
c. Half-wave potential
d. Wavelength
e. Optical density

106. C_7H_8O compound is an aromatic carbohydrate derivative and does not color with FeCl_3. Upon oxidation, it forms benzoic acid. Name this compound:
a. p-Cresol
b. Methylphenyl ether
c. m-Cresol
d. Benzyl alcohol
e. o-Cresol

107. Disintegration of adenosine nucleotides results in release of ammonia. What enzyme plays the key role in ammonia synthesis from these compounds?
a. Amylase
b. Lactate dehydrogenase
c. Alanine transaminase
d. Alcohol dehydrogenase
e. Adenosine deaminase

108. Research of reaction rate dependance from various factors allows to intensify technological processes. What factor textbfHAS NO effect on reaction rate constant?
a. Solvent nature
b. Solid substance dispersion degree
c. Reacting agents concentration
d. Temperature
e. Reagents nature

109. Staphylococci grow well on common nutrient media. However, when isolating pure cultures from patients, blood agar and yolk-salt agar are used for inoculation. What is the purpose of using these nutrient media?
a. To determine the tinctorial properties
b. To measure the sensitivity to antibiotics
c. To study the antigenic properties
d. To determine the mobility of the bacteria
e. To determine the pathogenicity factors

110. In what taxonomic division is the gametophyte predominant over the sporophyte during the plant's life cycle?
a. Lycopodiophyta
b. Magnoliophyta
c. Polypodiophyta
d. Pynophyta
e. Bryophyta

111. Causative agents of infectious diseases can be carried both by humans and animals. Name the group of infections that affect animals and can be passed onto humans:
a. Mixed
b. Anthroponoses
c. Sapronoses
d. Zoonoses
e. Zooanthroponoses

112. What working solutions (titrants) are used in the method of precipitation titration - Volhard method?
a. AgNO_3 and NH_4SCN
b. HClO_4 and KOH

c. $Na_2S_2O_3$ and $K(I_3)$
d. H_2SO_4 and NaOH
e. $KMnO_4$ and $KBrO_3$

113. 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. Gibbs energy
d. Intrinsic energy
e. Enthalpy

114. A group of tourists set off for a hiking tour into the mountains. Two hours after the departure, some of them developed tachycardia and shortness of breath, which indicates hypoxia. What type of hypoxia is the cause of these disorders?
a. Hemic hypoxia
b. Tissue hypoxia
c. Respiratory hypoxia
d. Hypoxic hypoxia
e. Circulatory hypoxia

115. After administration of a drug, the patient presents with itching, skin rash, difficulty breathing, blood pressure of 70/40 mm Hg, and dizziness. What allergic reaction according to the Coombs-Gell classification has likely developed in the patient?
a. Stimulatory hypersensitivity reaction
b. Delayed hypersensitivity reaction
c. Arthus reaction
d. Anaphylactic reaction
e. Cytolysis

116. A patient with type II diabetes mellitus was prescribed a synthetic drug that is a sulfonylurea derivative. Name this drug:
a. Furosemide
b. Prednisolone
c. Anaprilin (Propranolol)
d. Insulin
e. Glibenclamide

117. Androecium of Brassica oleracea flower has six stamens, with four stamens of inner circle longer than two stamens of outer circle. What is this type of androecium called?
a. Tetradynamous
b. Polydelphous
c. Didynamous
d. Diadelphous
e. Monadelphous

118. Dimethylethylamine belongs to:
a. Tertiary amines
b. Secondary amines
c. -
d. Primary amines
e. Quaternary ammonium salts

119. The method consisting of removal of low-molecular impurities from colloidal systems and high-molecular compound solutions by means of diffusion through semipermeable membrane is called:
a. Electrodialysis
b. Decantation
c. Dialysis

d. Ultrafiltration
e. Compensatory dialysis

120. What substance is used as a primary standard in permanganometry, bromatometry, dichromatometry, iodometry, and cerimetry?
a. Potassium hydroxide
b. Ammonium acetate
c. Sodium chloride
d. Arsenic(III) oxide
e. Sodium carbonate

121. Catabolism of body's own tissue proteins is intensified during such diseases as thyrotoxicosis and tuberculosis. This process is attended by a certain compound been intensively synthesized in liver and subsequently excreted with urine. Name this compound:
a. Glucose
b. Nucleotides
c. Fatty acids
d. Acetone bodies
e. Urea

122. Endocrinological analysis detects growth hormone deficiency in a schoolboy. What pathology can develop in the child?
a. Acromegaly
b. Pituitary nanism
c. Pituitary cachexia
d. Pituitary gigantism
e. Adiposogenital dystrophy

123. Among dosage forms there are numerous disperse systems. Select a free disperse system from the list:
a. Jelly
b. Emulsion
c. Gel
d. Membrane
e. Diaphragm

124. Plants that grow in moderately humid conditions belong to the following ecological group:
a. Hygrophytes
b. Xerophytes
c. Succulents
d. Mesophytes
e. Hydrophytes

125. A Poaceae plant has linear leaves with several non-branching veins that are parallel to the edge of the lamina, which indicates the following type of leaf venation:
a. Arcuate
b. Dichotomous
c. Pinnate
d. Parallel
e. Palmate

126. To accurately calculate the reaction velocity constant by the activation energy value, the steric factor is used, which takes into account:
a. Temperature of the reaction mixture
b. Mutual orientation of the reacting molecules
c. Chemical properties of the interacting compounds
d. Concentration of the reactants
e. Structure of the molecules in the interacting compounds

127. A fruit is a capsule with oblate light brown smooth glossy seeds that mucify when moistened. This fruit belongs to:
a. Ledum palustre
b. Linaria vulgaris
c. Linum usitatissimum
d. Digitalis purpurea
e. Hypericum perforatum

128. Chromatographic methods can be classified by the mechanism of the separation process. What type of chromatography is gas-liquid chromatography?
a. Affinity chromatography
b. Gel-filtration chromatography
c. Adsorption chromatography
d. Distribution chromatography
e. Ion-exchange chromatography

129. What substance is a mediator of delayed-type hypersensitivity?
a. Lymphokines
b. Histamine
c. Serotonin
d. Prostaglandins
e. Bradykinin

130. What substance can enter into substitution and addition reactions?
a. Polypeptide
b. Ethane
c. Acetylene
d. Ethylene
e. Ethanol

131. Introduction of immune preparation allows to form artificial acquired immunity. What preparation of those listed below is used to form artificial passive immunity?
a. DPT vaccine
b. Choleragen-anatoxin
c. Brucellosis vaccine
d. Antitetanus serum
e. BCG vaccine

132. A plant has lacticifers with milky sap and single flowers with deciduous calyx lobes; the fruit is a capsule. Determine the family of this plant based on these diagnostic characters:
a. Rosaceae
b. Fabaceae
c. Papaveraceae
d. Apiaceae
e. Compositae

133. After a stress, a woman has problems sleeping. What medicine is preferable for the treatment of insomnia in this case?
a. Phenobarbital
b. Chloral hydrate
c. Barbital
d. Nitrazepam
e. Aminazine (Chlorpromazine)

134. On examination the patient's sclera and oral mucosa are icteric. What biochemical blood value can be expected to be increased?
a. Albumin
b. Cholesterol
c. Glucose

d. Amylase
e. Bilirubin

135. Bacteriology of the feces of a patient with an acute intestinal infection allowed isolating a culture of Shigella sonnei. What serological reaction was used to identify the isolated culture?
a. Agglutination
b. Bacteriolysis
c. Neutralization
d. Precipitation
e. Complement binding

136. A patient suffers from hyperchromic B_12-deficiency anemia. What vitamin preparation should be prescribed in this case?
a. Riboflavin
b. Thiamine chloride
c. Retinol acetate
d. Cyanocobalamin
e. Vicasol (Menadione)

137. Name the initial compound for the synthesis of phthalic acid:
a. m-Xylene
b. o-Xylene
c. 2-Chlorobenzoic acid
d. Salicylic acid
e. 1,2-Dichlorobenzene

138. A patient with a joint disorder was prescribed an ointment that contains as its active substance a certain glycosaminoglycan that is the most important component of cartilage. Name this glycosaminoglycan:
a. Heparin
b. Glycogen
c. Starch
d. Arabinose
e. Chondroitin sulfate

139. A patient with gout was prescribed allopurinol - a competitive inhibitor of xanthine oxidase. Xanthine oxidase is a terminal enzyme of catabolism of:
a. Purine nucleotides
b. Higher fatty acids
c. Phospholipids
d. Glycoproteins
e. Heteropolysaccharides

140. A patient at the gastroenterological department presents with disturbed digestion of proteins, which is why the activation of the decay of proteins can be observed in the patient's large intestine. What compound forms in a large amount under these conditions?
a. Putrescine
b. Glycerine
c. Cholesterol
d. Glycogen
e. Glucose

141. A certain reaction is successfully used for rapid diagnostics of many bacterial, viral, protozoal, and fungal diseases, as well as for detection of pathogens in the environment, food, and water. This reaction is based on the principle of repeated copying of a specific DNA segment or a single gene, using the DNA polymerase enzyme. Name this reaction:
a. Immunofluorescence reaction
b. Enzyme-marked antibody reaction
c. Enzyme-linked immunosorbent assay

d. Radioimmunoassay
e. Polymerase chain reaction

142. After a subtotal gastric resection, the patient developed B_12-deficiency anemia. What cells in a blood smear are typical in this pathology?
a. Normoblasts
b. Erythroblasts
c. Microcytes
d. Anulocytes
e. Megaloblasts

143. Each stem node of white deadnettle (Lamium album) has two leaves that grow perpendicularly to the leaves of the previous node. Such leaf arrangement is called:
a. Spiral
b. Verticillate
c. Cross-opposite
d. Leaf mosaic
e. Rosette

144. To choose an indicator for acid-base titration, a titration curve needs to be built. This curve reflects the dependence of:
a. Solution pH from the volume of the added titrant
b. Solution pH from the temperature
c. Concentration of the analyzed compound from solution pH
d. Solution pH from the concentration of the added titrant solution
e. Solution pH from the volume of the solution being analyzed

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

146. Pharmacy sells glaucine hydrochloride to a patient with chronic bronchitis. What common side effect should he be warned about?
a. Disruption of cardiac rate
b. Allergic skin rashes
c. Excitation of central nervous system
d. Increase of intraocular pressure
e. Decrease of arterial pressure

147. Interleukin-1 is one of the secondary pyrogens in a fever. What cells are the main producers of this pyrogen?
a. Lymphocytes
b. Macrophages
c. Tissue basophils
d. Eosinophils
e. Platelets

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

149. Why do alcohols have higher boiling points as compared to their isomeric ethers?
a. Ether ability to form associates
b. Increased molecular weight
c. Ability to participate in electrophilic substitution reactions
d. Dehydration ability of alcohols
e. Formation of intermolecular hydrogen bonds

150. A man with left ventricular heart failure and signs of developing pulmonary edema was brought into an emergency hospital. What is the primary pathogenetic mechanism of the developed edema in this case?
a. Toxic
b. Colloidal-osmotic
c. Membranogenic
d. Hydrodynamic
e. Lymphogenic

151. What nutrient medium is used for obtaining a fungal culture?
a. Casein-carbon agar
b. Endo medium
c. Sabouraud medium
d. Ploskirev medium
e. Kitt-Tarozzi medium

152. What indicator is used for the quantitative determination of sodium carbonate in a preparation by the method of acid-base titration?
a. Murexide
b. Diphenylamine
c. Ferroin
d. Methyl orange
e. Methylene blue

153. The fruit is a spiky spherical green capsule. The capsule splits open into two valves and contains usually one large glossy dark brown seed with a matt whitish scar. It is a fruit of:
a. Plantago major
b. Papaver somniferum
c. Hipericum perforatum
d. Aesculus hippocastanum
e. Datura stramonium

154. A patient with food poisoning, accompanied by diarrhea and multiple episodes of vomiting, developed dehydration. What type of total blood volume disorder can be observed in this case?
a. Oligocythemic hypovolemia
b. Polycythemic hypervolemia
c. Oligocytemic hypervolemia
d. Normocythemic hypovolemia
e. Polycythemic hypovolemia

155. Solutions of colloidal surfactants are typical representatives of lyophilic dispersion systems. What is a characteristic feature of colloidal surfactants?
a. Ionogenicity
b. Non-polarity
c. Polarity
d. Amphiphilicity (Diphilicity)
e. Non-ionogenicity

156. What drug is used as an antidote in cases of overdose with narcotic analgesics?
a. Cordiamine (Nikethamide)
b. Naloxone
c. Unithiol

d. Ephedrine
e. Atropine

157. A pharmaceutical factory has received a batch of a herbal raw material that, based on the external signs, was affected by a viral disease. What modern method of diagnostics should be used for the specific detection of viral nucleic acids in plants?
a. Indirect hemagglutination reaction
b. Enzyme-linked immunosorbent assay
c. Hemagglutination reaction
d. Molecular hybridization
e. Hemagglutination inhibition reaction

158. A patient presents with inflammation of the nasal mucosa: redness, edema, profuse mucus discharge from the nasal passages. This clinical presentation corresponds with the following stage of inflammation:
a. Proliferation
b. Immunologic
c. Biochemical
d. Exudation
e. Alteration

159. What rule describes the coagulation of sols under the effect of electrolytes?
a. Arrhenius equation
b. Gibbs rule
c. Duclos–Traube rule
d. Van 't Hoff rule
e. Schulze-Hardy rule

160. Microscopy of plants detects parenchymal cells with thin membranes, a large nucleus, and a large number of ribosomes. What tissue is it?
a. Parenchyma
b. Meristematic tissue
c. Dermal tissue
d. Secretory tissue
e. Mechanical tissue

161. Because of suberization, the cell membranes do not become moistened with water, are impermeable to water and gases, and are resistant to decay. What tissue can contain suberized cells?
a. Periderm
b. Cambium
c. Phelloderm
d. Epidermis
e. Phloem

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

163. Cases of tonsillitis periodically occur in the children that attend a kindergarten. During preventive examination, a medical laboratory scientist obtained pharyngeal swabs from ten children and stained the obtained material using the Neisser technique. Microscopy detects thin yellow rod-shaped microorganisms with dark brown thickenings at their ends, arranged in the shape of Roman numerals X and V. What infectious disease can be caused by the detected causative agents?
a. Tuberculosis
b. Scarlet fever

c. Infectious mononucleosis
d. Diphtheria
e. Pneumonia

164. A patient has periodic urticaria that manifests as blisters that the patient develops on the skin after eating red fish. The patient has been diagnosed with anaphylactic allergic reaction. In this case, an increase in the titer of a certain immunoglobulin would be detected. Name this immunoglobulin.
a. IgG
b. IgA
c. IgE
d. IgD
e. IgM

165. 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:
a. KCl
b. Cu(NO_3)_2
c. K_3PO_4
d. Al_2(SO_4)_3
e. Na_3PO_4

166. When working in the garden, a man accidentally cut his hand. The wound remained untreated. Shortly after that the wounded area developed inflammation with accumulation of exudate that contained numerous viable and degenerate neutrophils. What type of exudate is it?
a. Purulent
b. Hemorrhagic
c. Serous
d. Catarrhal
e. Fibrinous

167. In the age of 5 months the child had measles antibodies in the blood. By the age of 1 year these antibodies disappeared from the child's blood. Why were these antibodies present in the child's blood?
a. Innate immunity
b. Non-specific resistance
c. Acquired natural active immunity
d. Artificial immunity
e. Acquired natural passive immunity

168. 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. Hexokinase
b. Creatine kinase
c. Xanthine oxidase
d. Lactate dehydrogenase
e. Dihydrofolate reductase

169. During the study of home-made canned vegetables, microorganisms that resemble a tennis racket were inoculated on the Kitt-Tarozzi medium. What disease is likely to be caused by these pathogens?
a. Shigellosis
b. Botulism
c. Escherichiosis
d. Salmonellosis
e. Cholera

170. A tumor of the adenohypophysis disturbs the synthesis of tropic hormones and causes acromegaly. What hormone would exhibit elevated levels in this case?
a. Oxytocin

b. Luteinizing
c. Somatotropin
d. Vasopressin
e. Follicle-stimulating

171. Albinism can be characterized by disturbed metabolism of a certain amino acid. Name this amino acid.
a. Tryptophan
b. Phenylalanine
c. Histidine
d. Methionine
e. Glutamine

172. What indicators are used to determine the titration endpoint in the acid-base titration method?
a. Metal indicators
b. Adsorption indicators
c. Redox indicators
d. Luminescent indicators
e. pH indicators

173. A 71-year-old woman with cholecystitis has developed mechanical jaundice. What type of arrhythmia will develop in this case?
a. Sinus tachycardia
b. Extrasystole
c. Sinus bradycardia
d. Ciliary arrhythmia
e. Atrioventricular block

174. Pathogenic microorganisms produce various enzymes in order to penetrate body tissues and spread there. Point out these enzymes among those named below:
a. Lyase, ligase
b. Oxydase, catalase
c. Hyaluronidase, lecithinase
d. Esterase, protease
e. Transferase, nuclease

175. The inflorescence of a plant has an elongated main axis and sessile flowers. What type of inflorescence is it?
a. Umbel
b. Flat capitulum
c. Spike
d. Corymb
e. Round capitulum

176. Emulsions are thermodynamically unstable. In them, the droplets of dispersed phase merge together spontaneously, causing the emulsion to stratify. Name this phenomenon:
a. Solubilization
b. Deformation
c. Coalescence
d. Contraction
e. Wetting

177. To determine causative agent of the disease, a Gram-stained smear was prepared from the material obtained from the patient with furunculosis. Staphylococci were detected in the smear. What microscopic presentation allows making this conclusion?
a. Gram-positive cocci in grape-like clusters
b. Gram-positive cocci in short chains
c. Gram-negative cocci in grape-like clusters
d. Gram-negative cocci in short chains

e. Gram-negative bacilli in short chains

178. Herbarium specimens of medicinal plants are being studied. Which one of them belongs to Rosaceae family?
a. Conium maculatum
b. Melilotus officinalis
c. Crataegus sanguinea
d. Capsella bursa-pastoris
e. Polygonum persicaria

179. Uric acid is the end product of purine nucleotide breakdown. Elevated levels of uric acid in blood lead to the development of:
a. Gout
b. Diabetes mellitus
c. Glycogenosis
d. Gastritis
e. Hepatitis

180. A person with essential hypertension was prescribed lisinopril. What is the typical side effect of this medicine?
a. Constipation
b. Vomiting
c. Dry cough
d. Increased appetite
e. Insomnia

181. Having prepared a nutrient medium with carbohydrate solutions, the laboratory assistant sterilized it. What sterilization method was used?
a. Dry heat
b. One-time boiling
c. Fractional, using flowing steam
d. Steam under pressure
e. Ultraviolet irradiation

182. In human body, thyroxine is an important thyroid hormone. What microelement is necessary to synthesize this hormone?
a. Calcium
b. Iron
c. Potassium
d. Copper
e. Iodine

183. Hydrolytic destruction of compounds is carried out by a certain class of enzymes - hydrolases. What compounds are being hydrolyzed with proteases?
a. Glucose
b. Higher fatty acids
c. Proteins
d. Carbon dioxide
e. Pyruvic acid

184. A laboratory received ethanol and methanol. What reaction can be used to distinguish between these two substances?
a. Formation of a chelate complex with copper hydroxide
b. Oxidation (CrO_3, H_2SO_4)
c. Beilstein test
d. Reaction with halogen anhydrides of inorganic acids
e. Iodoform test (I_2 + NaOH)

185. The second stage of detoxification involves joining certain chemical compounds with functional

groups of toxines. Select one such compound:
a. Cholesterol
b. Glucuronic acid
c. Pyruvate
d. Glucose
e. Higher fatty acids

186. A patient with current coronary heart disease who has had two myocardial infarctions of left ventricular wall presents with bubbling breathing and dyspnea. Pulmonary auscultation reveals moist crackles. What kind of heart failure is it?
a. Right ventricular
b. Subcompensated
c. Left ventricular
d. Compensated
e. Combined

187. Under certain conditions, solutions of high-molecular substances can lose their flowability, meaning that the bonds begin to form between macromolecules, leading to the formation of a spatial grid. Name this process:
a. Condensation
b. Coacervation
c. Coagulation
d. Gel formation
e. Peptization

188. A woman with trichomoniasis was prescribed a drug that is an imidazole derivative. Name this drug:
a. Ampicillin
b. Resorcin
c. Iodinol
d. Metronidazole
e. Miramistin

189. A patient with gastric carcinoma has undergone several courses of radiation therapy. What system is the first to become functionally disturbed after the body was exposed to ionizing radiation?
a. Respiratory
b. Blood
c. Urinary
d. Digestive
e. Nervous

190. Examination of the patient's oral cavity detects the signs of aphthous stomatitis. Microscopy of the smears prepared from the contents of the aphthous ulcers shows gram-positive round and oval cells that vary in size and exhibit signs of budding pattern of cell division. What microorganisms are the likely cause of this pathology?
a. Staphylococci
b. Streptococci
c. Pneumococci
d. Meningococci
e. Candida fungi

191. A certain drug is a first-line antituberculosis agent. Its possible side effects include polyneuritis, hepatotoxicity, mental disorders, and allergic reactions. Name this drug.
a. Clotrimazole
b. Isoniazid
c. Adrenaline hydrochloride
d. Meloxicam
e. Atropine

192. What optical phenomenon is most intensive in suspensions?
a. Light scattering
b. Light reflection
c. Light transmission
d. Light refraction
e. Light absorption

193. A dithizone solution was added into the studied alkaline solution of cations that belong to the IV analytical group. As a result, a compound formed that was coloring not only the organic but also the aqueous phase in red. What cations are present in the solution, as indicated by this analytical effect?
a. Al^3+
b. Zn^2+
c. Cr^3+
d. Fe^3+
e. Bi^3+

194. The following have been detected in hand lavage of the kindergarten chef: colibacilli, ray fungi, staphylococci, bacilli, mold fungi. What microbes are evidential of fecal contamination of hands?
a. Ray fungi
b. Bacilli
c. Colibacilli
d. Mold fungi
e. Staphylococci

195. A potassium chromate solution was added into the solution being analyzed, which resulted in the formation of a yellow precipitate, soluble in acetic acid. What cations were present in the solution, as indicated by this qualitative reaction?
a. Sodium cations
b. Strontium cations
c. Ammonium cations
d. Potassium cations
e. Magnesium cations

196. Pterin derivatives are used as antitumor agents, because they are the equivalents of the coenzyme required for the synthesis of thiamine monophosphate. This coenzyme is the active form of the following vitamin:
a. Riboflavin
b. Thiamine
c. Lipoic acid
d. Ascorbic acid
e. Folic acid

197. A patient is diagnosed with acute pancreatitis. For diagnostic purpose it is necessary to measure the activity of the following enzyme in the patient's blood:
a. Aldolase
b. LDH
c. Creatine kinase
d. Amylase
e. Pepsin

198. A 60-year-old man with heart failure has received a cardiotonic that is a beta_1 adrenergic agonist. Name this drug:
a. Dobutamine
b. Papaverine
c. Salbutamol
d. Potassium aspartate and magnesium aspartate
e. Xenical (Orlistat)

199. A 3.5-year-old child has been diagnosed with dysbacteriosis in the form of critical reduction of

gram-positive anaerobic bacteria and increased number of staphylococci and yeast fungi. What preparation should be used for the correction of dysbacteriosis?
a. Furazolidone
b. Bifidumbacterin
c. Lactoglobulin
d. Coli-Proteus bacteriophage
e. Colibacterin

200. Because of its antiplatelet effect, acetylsalicylic acid is used in the treatment of diseases of the cardiovascular system. What mechanism is this effect based on?
a. Stimulation of synthesis of E1 prostaglandins
b. Inhibition of COX-2 enzyme activity
c. Inhibition of COX-1 enzyme activity
d. Reduction of synthesis of E2 prostaglandins
e. Inhibition of thromboxane A2 biosynthesis

201. What reaction occurs when ascorbic acid is being determined by means of iodometry?
a. Redox
b. Neutralization
c. Precipitation
d. Acylation
e. Complex formation

202. To treat atherosclerosis a patient has obtained hypolipidemic agent - Fenofibrate - from pharmacy. What is the pharmacological group of this drug?
a. Muscarinic cholinergic receptor antagonists
b. Calcium channel blocking agents
c. Nitrofuranes
d. beta-adrenergic blocking agents
e. Fibrates

203. After the total resection of the stomach, the patient developed severe B_12-deficiency anemia with impaired hematopoiesis and altered erythrocytes appearing in the blood. What forms of erythrocytes indicate this disease in the patient, if they are present in the blood?
a. Megalocytes
b. Normocytes
c. Microcytes
d. Ovalocytes
e. Annulocytes (codocytes)

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

205. What method of redox titration uses specific pH indicators for fixation of the titration endpoint?
a. Nitritometry
b. Cerimetry
c. Permanganatometry
d. Iodometry
e. Bromatometry

206. Crystalline lead(IV) dioxide in the presence of concentrated nitric acid is used to detect the presence of manganese(II) cations in a solution. What visual analytical effect is observed in the

process?
a. A blue precipitate is formed
b. The solution colors green
c. The solution colors yellow
d. The solution colors pink
e. A white precipitate is formed

207. Specify the analgesic that affects opiate receptors and can cause development of tolerance and dependence:
a. Morphine
b. Medazepam
c. Haloperidol
d. Voltaren (Diclofenac sodium)
e. Phenobarbital

208. Cytology has detected sex chromatin (Barr bodies) in interphase cell nuclei of a 23-year-old man. What chromosomal disorder is it characteristic of?
a. Down syndrome
b. Turner syndrome
c. Trisomy X
d. Klinefelter syndrome
e. Cri-du-chat syndrome

209. What is the name of the lower expanded hollow part of the pistil of a flower, where ovules are located?
a. Receptacle
b. Stylus
c. Stigma
d. Ovary
e. Gynoecium

210. In microbiology class students have been growing pure bacterial culture. Bacterial inoculation of solid medium was performed to obtain separate visible colonies, resulting in two colonies, R-type and S-type, grown in thermostat after one day of incubation. What properties of microorganisms were described by students?
a. Biochemical
b. Cultural
c. Tinctorial
d. Antigenic
e. Morphologic

211. An analytical chemist conducts a systematic analysis of a mixture of anions. What reagents are used in the test for oxidizing anions?
a. Na_2C_2O_4
b. KI in the presence of chloroform
c. HCl in the presence of amyl alcohol
d. AgNO_3 in the presence of HNO_3
e. Ba(NO_3)_2

212. A pregnant woman develops leg edemas in the evening. In the morning, the edemas disappear. What pathogenetic factor contributes to the development of edema in this case?
a. Decrease of oncotic blood pressure
b. Increase of oncotic blood pressure
c. Increase of hydrostatic blood pressure
d. Decrease of hydrostatic blood pressure
e. Hyperglycemia

213. A 70-year-old man came to a doctor with complaints of enlarged hands, feet, tongue, and facial features. Examination reveals a significant increase of somatotropin levels in the patient's blood.

What causes this condition in the patient?
a. Adenohypophyseal hypofunction
b. Adenohypophyseal hyperfunction
c. Hyperfunction of the adrenal cortex
d. Hyperparathyroidism
e. Hypothyroidism

214. Some medicinal plants are poisonous. Select a poisonous plant from the list below:
a. Origaum vulgare
b. Thymus serpilum
c. Thymus vulgaris
d. Digitalis purpurea
e. Salvia officinalis

215. The ornithine cycle is the main way of ammonia neutralization in the human body. What substance is the end product of ammonia neutralization?
a. Urea
b. Carbamoyl phosphate
c. Citrulline
d. Arginine
e. Uric acid

216. A characteristic reaction between sodium sulfide and the salts of an unknown cation has produced a white precipitate. What cation was it?
a. Mercury
b. Magnesium
c. Zinc
d. Copper
e. Lead

217. A girl with type 1 diabetes mellitus has developed chronic kidney failure. What complication of diabetes is the cause of diabetic nephropathy in this case?
a. Fetopathy
b. Macroangiopathy
c. Microangiopathy
d. Retinopathy
e. Neuropathy

218. A certain herbaceous plant grows on the meadows of the Carpathian Mountains. It has orange anthodium inflorescences, upright stem, and a rosette of basal leaves. Name this plant:
a. Cychorium intybus
b. Calendula officinalis
c. Centaurea cyanus
d. Echinacea purpurea
e. Arnica montana

219. During ultrasound investigation a patient was diagnosed with bilateral renal artery stenosis of atherosclerotic genesis. Specify the bioactive substance that due to its excessive secretion is the key component of arterial hypertension pathogenesis in the given case:
a. Noradrenaline
b. Thyroxin
c. Cortisol
d. Vasopressin
e. Renin

220. A woman suffering from neurosis has disturbed sleep. What drug is optimal for insomnia treatment?
a. Nitrazepam
b. Valerian tincture

c. Aethaminalum-natrium (Pentobarbital)
d. Bromisoval
e. Phenobarbital

221. In pharmaceutical technology, analysis of the phase diagram of systems is of practical importance. What type of equilibrium is characterized by the figurative point on the phase diagram of water?
a. One-component, three-phase, non-variant
b. One-component, two-phase, non-variant
c. Two-component, one-phase, one-variant
d. One-component, one-phase, non-variant
e. Two-component, two-phase, one-variant

222. A child presents with increased nervous excitability, spontaneous tetany attacks, dry skin, brittle nails and hair, and subcutaneous calcifications in the area of the auricles. What hormone is deficient in this case, causing the described changes?
a. Thyroid hormones
b. Progesterone
c. Oxytocin
d. Vasopressin
e. Parathyroid hormone

223. Inheritable genetic disorders can result in disturbed enzyme synthesis in the human body. What enzyme deficiency results in disturbed break-up of lactose:
a. Lipase
b. Maltase
c. Lactase
d. Peptidase
e. Invertase

224. A 33-year-old female patient, who undergoes long-term treatment due to chronic polyarthritis, complains of increased arterial pressure, adipose tissue redistribution and menstrual irregularities. What drug does the patient take?
a. Indometacin
b. Prednisolone
c. Phenylbutazone
d. Diclofenac sodium
e. Fluocinolone acetonide

225. During anaerobic glycolysis, ATP synthesis occurs by means of substrate phosphorylation that uses the energy of other macroergic compounds. Name one such compound:
a. Lactate
b. Phosphoenolpyruvate
c. Glucose-6-phosphate
d. Pyruvate
e. Glucose

226. An enzyme transports structure fragments from one substrate into another. Name this class of enzymes:
a. Hydrolases
b. Ligases
c. Isomerases
d. Oxidoreductases
e. Transferases

227. When activated carbon is included in the combination therapy, the absorption of the other drugs changes in the following way:
a. Decreases
b. Remains unchanged

c. Accelerates
d. Activates
e. Increases

228. During the morphological analysis of a flower, the presence of a reduced perianth in the form of two membranes - lodicules - was established. Its stamens have long staminal filaments. Its pistil has a feathery stigma. This description is characteristic of the plants that belong to the following family:
a. Convallariaceae
b. Alliaceae
c. Pinaceae
d. Poaceae
e. Lamiaceae

229. Name the process of spontaneous adhesion of drops in an emulsion to each other:
a. Flocculation
b. Sedimentation
c. Coalescence
d. Coagulation
e. Flotation

230. Which of the given reactions produces ethane as a result?
a. [CH_2=CH_2xrightarrow[t^o, p]H_2, кат.]
b. [C_2H_5OHxrightarrow[]k.H_2SO_4, t^o]
c. [Al_4C_3xrightarrow[]H_2O]
d. [CO + 2H_2xrightarrow[]Fe, t^o]
e. -

231. Which of the amines listed below is a primary amine?
a. C_6H_5NHCH_3
b. C_6H_5N(CH_3)_2
c. C_6H_5CH_2NH_2
d. C_6H_5CH_2N(CH_3)_2
e. C_6H_5CH_2NHCH_3

232. What is the name of an elongated dehiscent fruit formed from a coenocarpous gynoecium and divided by a membranous partition with seeds?
a. Disk-shaped schizocarp
b. Legume
c. Cremocarp
d. Capsule
e. Silique

233. A colloidal solution emits a matte glow, when light passes through it, due to the light scattering on the colloidal particles as a result of diffraction. Name this physical phenomenon:
a. Intramolecular diffraction
b. Opalescence
c. Sedimentation
d. Coagulation
e. Syneresis

234. Phytopathogenic microorganisms can significantly affect the yield of medicinal plants by decreasing their biomass or content of active substances. A plant afflicted with phytopathogenic microorganisms can develop rot in the organs and tissues rich in water, which leads to discoloration and changes in taste and odor. What microorganisms are the most common cause of rot?
a. Viruses and bacteria
b. Fungi and bacteria
c. Viruses and rickettsia
d. Mycoplasma and viroids
e. Mycoplasma and rickettsia

235. A patient has been prescribed drug with antibacterial effect on tuberculosis mycobacteria. What drug is used in tuberculosis treatment and is pyridoxine antivitamin?

a. Isoniazid

b. Streptomycin

c. Heparin

d. Sulfanilamide

e. Trimethoprim/sulfamethoxazole (Co-trimoxazole)

236. As a result of a car accident, a man (driver) has suffered an extensive blood loss. He presents with rapid breathing, tachycardia, and low blood pressure. What pathological condition is likely to be observed in him one hour after the blood loss?

a. Hypovolemia

b. Erythrocyte hypochromia

c. Erythrocyte hyperchromia

d. Dyslipidemia

e. Hyperglycemia

237. A 9-year-old child due to acute bronchitis developed elevated body temperature up to 38.5^oC that lasted for a week and was then followed by a drop in the temperature down to 37.0^oC) What mechanism is leading at the 3rd stage of fever?

a. Development of chills

b. Increased diuresis

c. Peripheral vasodilation

d. Increased respiration rate

e. Increased heat production

238. A patient with arterial hypertension has been taking a beta-adrenergic blocker for a long time. When his condition improved he abruptly stopped taking the drug, which resulted in sharp elevation of his blood pressure. Name this type of therapy complication:

a. Drug tolerance

b. Bronchospasm

c. Bradycardia

d. Dysbiosis

e. Withdrawal syndrome

239. The process of putrefaction is a component of physicochemical changes that occur with food proteins in the human gastrointestinal tract. What product is excreted with the urine and is an indicator of the intensity of the protein putrefaction in the large intestine?

a. Cholesterol

b. Ammonia

c. Benzene

d. Indican

e. Bilirubin

240. Fenofibrate belongs to the following pharmacological group:

a. Indirect-acting anticoagulants

b. Antihypertensive drugs

c. Hypolipidemic drugs

d. Fibrinolysis inhibitors

e. Hypnotics

241. During what process does the entropy of a system decrease?

a. Polymerization

b. Sublimation

c. Evaporation

d. Dissolution

e. Dissociation

242. A woman is to be prescribed a narcotic analgesic for labor pain relief. What drug is indicated in

this case?
a. Promedol (Trimeperidine)
b. Morphine
c. Papaveretum (Omnopon)
d. Codeine
e. Fentanyl

243. Disperse systems compose a large part of all dosage forms. Point out the bound disperse system:
a. Aerosol
b. Lyosol
c. Emulsion
d. Suspension
e. Gel

244. What nutrient medium should be used by a laboratory technician to determine the total fungal count in a soft dosage form?
a. Endo medium
b. Meat peptone agar
c. Mannitol salt agar
d. Bismuth sulfite agar
e. Sabouraud agar

245. What ion has the maximum coagulating effect when added into positively charged sols?
a. Cl^-
b. K^+
c. SO_4^2-
d. PO_4^3-
e. Al^3+

246. What standard solution can be used to standardize the solution of I_2?
a. Sodium thiosulfate solution
b. Potassium iodide solution
c. Potassium dichromate solution
d. Potassium permanganate solution
e. Sodium nitrite solution

247. Extraction is often used in analysis of medicinal substances. In this method, the degree of extraction of the substance that is being determined depends on the following:
a. Temperature
b. The amount of the substance being extracted
c. The mass of the substance being extracted
d. Distribution coefficient
e. pH of the solution

248. What method is used for the quantification of bismuth in a preparation?
a. Argentometry
b. Mercurimetry
c. Complexonometry
d. Iodometry
e. Permanganatometry

249. Fatty acids are being synthesized in human body. What compound is intial in this synthesis process?
a. Succinate
b. Vitamin C
c. Cholesterol
d. Glycine
e. Acetyl-CoA

250. A patient has mucosal dryness and mesopic vision disorder. What vitamin deficiency causes these symptons?
a. A
b. E
c. D
d. C
e. P

251. An iodine solution was prepared using the method of established titer. What primary standards can be used for the standardization in this case?
a. Ammonium oxalate and oxalic acid
b. Potassium dichromate and potassium bromate
c. Metallic iron and iron(II) sulfate
d. Sodium tetraborate and sodium carbonate
e. Hydrazine sulfate and arsenic(III) oxide

252. Sanitary microbiological investigation of potable water has detected coliphages. What conclusion can be made about the sanitary-hygienic status of this water?
a. The water is safe to drink
b. Artesian water
c. The water is safe to drink after boiling
d. Fecal contamination
e. The water is for industrial use only

253. What method is used for simultaneous elimination of the effect of foreign substances, concentration, and determination of concentration?
a. Refractometry
b. Polarimetry
c. Extraction-photometric analysis
d. Differential spectrophotometry
e. Fluorimetry

254. Rhizome and roots of Inula helenium have cavities without clear inner margins that are filled with essential oils. What are they?
a. Resin ducts
b. Schizogenous cavities
c. Lysigenous cavities
d. Non-articulated laticifers
e. Articulated laticifers

255. What antibiotic is a drug of choice for treatment of syphilis?
a. Polymyxin M sulfate
b. Streptomycin sulfate
c. Levorin sodium salt
d. Benzylpenicillin sodium salt (Penicillin G sodium salt)
e. Lincomycin hydrochloride

256. Interferons have the properties of antiviral antibiotics and natural antitumor factors, which is why they are widely used in medical practice. Their protective effects are realized by influencing a certain stage of protein biosynthesis. Name this stage.
a. Translation termination
b. Translation elongation
c. Transcription termination
d. Translation initiation
e. Transcription initiation

257. Thiocyanatometric titration method requires secondary standard solution of potassium thiocyanate that is standardized with standard solution of:
a. Iron(II) sulfate

b. Hydrochloric acid
c. Copper(II) nitrate
d. Silver nitrate
e. Sulfuric acid

258. An elderly patient suffers from constipation caused by colon hypotonia. What drug should be prescribed?
a. Bisacodyl
b. Castor oil
c. Novocainamide (Procainamide)
d. Atropine sulfate
e. Sodium sulfate

259. 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. 4.7
b. 7.0
c. 5.5
d. 14.0
e. 9.4

260. Photometry is one of the most common instrumental methods of analysis. It is based on the measurement of:
a. Wavelength
b. Rotation angle
c. Optical density
d. Refractive index
e. Fluorescence intensity

261. Autopsy of a lab rat that for the period of 24 hours remained in an immobilization chamber revealed gastric erosions. What hormones can cause erosions in this case?
a. Estrogens
b. Glucagon
c. Glucocorticoids
d. Mineralocorticoids
e. Insulin

262. What factor will cause an increase in glomerular filtration in the kidneys?
a. Increased oncotic blood pressure
b. Increased intra-renal pressure
c. Reduced number of functioning glomeruli
d. Reduced oncotic blood pressure
e. Reduced hydrostatic pressure in the glomerular capillaries

263. Microscopy of an axial organ shows that between the secondary phloem and xylem there is a layer of live, thin-walled, tightly packed, slightly elongated cells. What structure is formed by these cells?
a. Procambium
b. Phellogen
c. Cambium
d. Pericycle
e. Periderm

264. To study the sanitary and microbiological quality of water at a laboratory, the minimum volume of water, in which bacteria of the Escherichia coli group can be detected, was determined. According to the State Standard of Ukraine, this value must be no less than:
a. 300
b. 200
c. 100

d. 400
e. 500

265. What analytical effect is observed during fixation of the end point in the Volhard titration?
a. A yellow precipitate is produced
b. A red precipitate is produced
c. A brown precipitate is produced
d. The solution colors red
e. The solution colors yellow

266. A patient with acute cardiac failure was prescribed an adrenoceptor agonist. Name this drug:
a. Metoprolol
b. Corglycon (Convallariae glycoside)
c. Salbutamol
d. Digoxin
e. Dobutamine

267. A 55-year-old patient was diagnosed with angina pectoris. A calcium channels blocking agent was prescribed for the treatment. Name this drug:
a. Amlodipine
b. Atenolol
c. Labetalol
d. Reserpine
e. Octadinum (Guanethidine)

268. What type of tautomerism is characteristic of monosaccharide?
a. Azole
b. Keto-enol
c. Oxo-cyclo (ring-chain)
d. Lactam-lactim
e. Aci-nitro

269. What drug should be administered for individual prevention of malaria?
a. Gentamicin
b. Ampicillin
c. Rifampicin
d. Biseptol (Co-Trimoxazole)
e. Chingamin

270. To enhance the solubility of the individual components of a number of liquid drug formulations, the colloidal surfactant are added. This process is based on the following physico-chemical phenomenon:
a. Sedimentation
b. Coagulation
c. Solubilization
d. Extraction
e. Diffusion

271. A patient with primary hypertension is prescribed captopril. What is this drug's mechanism of action?
a. Angiotensin II receptors block
b. Block of slow calcium channels
c. alpha-adrenergic block
d. beta-adrenergic block
e. Inhibition of angiotensin converting enzyme activity

272. During a surgery, narcosis overdose caused signs of acute hypoxia, indicated by increased heart rate of 124/min. and tachypnea. What type of hypoxia is observed in this case?
a. Mixed

b. Tissue
c. Respiratory
d. Circulatory
e. Hypoxic

273. Having matured, pistillate catkins of Betula penduta fall apart freeing nutlet seeds with:
a. One large wing petal
b. Two membranous wing petals
c. Villous coma
d. Bristly hooks
e. Two air vesicles

274. The defensive mechanisms against some infectious diseases can be greatly reinforced with interferon. Interferon preparations will be the most advisable in cases of the following type of infections:
a. Viral
b. Helminthic
c. Fungal
d. Protozoal
e. Microbioses

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

276. Bioavailability of a powder depends on the degree of comminution of the substance. The following value must be measured:
a. Solution density
b. Particle mass
c. Dispersion
d. Particle volume
e. Concentration

277. A person with a past history of acute myocardial infarction was recommended to take an antiaggregant that blocks platelet cyclooxygenase. What medicine can be classified as an antiaggregant?
a. Abciximab
b. Dipyridamole
c. Acetylsalicylic acid
d. Clopidogrel
e. Ticlopidine

278. What parameter is determined during a blood test for erythrocyte sedimentation rate?
a. Kinetic stability
b. Coagulation threshold
c. Sedimentation stability
d. -
e. Aggregate stability

279. What indicator is used in the Fajans-Khodakov method to determine sodium iodide (NaI)?
a. Ammonium iron(III) sulfate
b. Eosin
c. Potassium chromate
d. Diphenylcarbazone

e. Methyl orange

280. What fruits are apocarpous?
a. Cremocarp, disk-shaped schizocarp
b. Bean, single nutlet
c. Capsule, berry
d. Aggregate drupe, follicetum
e. Apple, acorn

281. Separation of substances in chromatography is based on the ability of solutes:
a. To precipitate
b. To dissolve
c. To distribute between two stationary phases
d. To distribute between the mobile and stationary phases
e. To distribute between two mobile phases

282. A patient has asked the dispensing chemist to recommend him a drug that can increase the endurance of an organism in adverse environmental conditions. The chemist recommended the following:
a. Eucalyptus tincture
b. Camomile flowers infusion
c. Calendula tincture
d. Schisandra tincture
e. Oak bark decoction

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

284. What anions form a precipitate soluble in 12% ammonium carbonate solution as a result of their interaction with a silver(I) nitrate solution?
a. Chloride ions
b. Thiocyanate ions
c. Iodide ions
d. Sulfide ions
e. Bromide ions

285. Due to spleen rupture a woman has developed internal hemorrhage with signs of severe hypoxia. What anatomical structure is the most susceptible to hypoxia?
a. Muscles
b. Kidneys
c. Lungs
d. Stomach
e. Cerebral cortex

286. Production of injection solutions in pharmacies requires srtict control of sterilization quality. What is placed in autoclave sterilization box to ensure proper control?
a. Ampoule with fungi spores
b. Ampoule with microbe spores
c. Ampoule with viruses
d. Ampoule with staphylococcus culture
e. Ampoule with colibacillus culture

287. Sodium hexanitrocobaltate(III) is used to determine the presence of potassium cations in a solution. What visual analytical effect is observed in this case?

a. Formation of a violet precipitate
b. Formation of a white precipitate
c. Formation of a yellow precipitate
d. Formation of a black precipitate
e. Formation of a blue precipitate

288. What unstratified (or, less often, stratified) tissue in plant stems, roots, and needles has a protective integumentary function and a water-storing function?
a. Exodermis
b. Epidermis
c. Epiblem
d. Periderm
e. Hypodermis

289. Koch's bacillus was detected in the sputum of the patient with pulmonary tuberculosis. In this patient tuberculosis bacillus assumes the following role:
a. Disease development condition
b. Condition conducive to the disease development
c. Risk factor of the disease
d. Causative agent of the disease
e. Condition hampering the disease development

290. Aldehyde dehydrogenase inhibitors are widely used in the treatment of alcohol dependence. What metabolite causes the feeling of disgust towards alcohol, if its blood level is elevated?
a. Cholesterol
b. Methanol
c. Acetaldehyde
d. Glucose
e. Fructose

291. Which of the following compounds is a complex ether (an ester)?
a. CH_3-O-C_2H_5
b. CH_3COOCH_3
c. C_15H_31COOH
d. C_2H_5OH
e. CH_3-O-CH_3

292. Calcium cations can be used as components of pharmaceuticals. Pharmacopoeial reaction for the detection of calcium cations is a reaction with a solution of:
a. Potassium iodide
b. Ammonium hydroxide
c. Ammonium oxalate
d. Hydrochloric acid
e. Sodium hydroxide

293. 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. H^+
b. NO_3^-
c. Ag^+
d. Cu^2+
e. OH^-

294. A 30-year-old patient has been hospitalized with complaints of increased body temperature, jaundice, and hemorrhagic rash on the skin and mucosa. A few days later, the patient developed acute renal failure. Microscopy of smears stained using the Romanowsky-Giemsa technique revealed twisting bacteria with secondary coils shaped like letters S and C) What bacteria are the most likely cause of the patient's disease?

a. Salmonella
b. Borrelia
c. Bordetella
d. Leptospira
e. Treponema

295. 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. Broad spectrum antibacterial agents
c. Antituberculous agents
d. Narrow spectrum antibacterial agents
e. Antiviral agents

296. What drug is indicated in case of an overdose of depolarizing muscle relaxants?
a. Unithiol
b. Metoprolol
c. Prozerin (Neostigmine)
d. Naloxone
e. Magnesium sulfate

297. Paracetamol has antipyretic and analgesic effect. In the human body it is neutralized in the following organ:
a. Liver
b. Intestine
c. Lungs
d. Spleen
e. Heart

298. Gout develops when purine nucleotide metabolism is disturbed. The doctor prescribed the patient allopurinol that is a competitive inhibitor of:
a. Hexokinase
b. Succinate dehydrogenase
c. Lactate dehydrogenase
d. Xanthine oxidase
e. Alcohol dehydrogenase

299. A 36-year-old man has no hydrochloric acid or pepsin in his gastric juice. What is this condition called?
a. Achylia
b. Achlorhydria
c. Cholemia
d. Hypochlorhydria
e. Hyperchlorhydria

300. After an 8-year-old boy had eaten some strawberries he developed red itching spots on his skin, urticaria. What bioactive substance causes the itching sensation in this case?
a. Tissue hyaluronidase
b. Prostaglandin E2
c. Complement component C3a
d. Cathepsin
e. Histamine

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

e. Decreased oncotic blood pressure

302. Select lyophilic systems among the dispersion systems listed below.
a. Surfactant solutions
b. Emulsions
c. Suspensions
d. Solid foams
e. Sols

303. What must be used to obtain a stable direct emulsion?
a. Hydrophobic emulsifier
b. Calcium oleate
c. Hydrophilic emulsifier
d. Lead stearate
e. Any emulsifier

304. After severe emotional strain a 53-year-old man suddenly developed acute pain in the heart area, which irradiates to the left hand, to the neck, and under the left scapula. He noted numbness of his left hand. His face is pale and covered in cold sweat. Nitroglycerine administration stopped the pain attack after 10 minutes had passed. What is the most likely disease in this case?
a. Stroke
b. Angina pectoris
c. Somatoform autonomic dysfunction
d. Pulmonary embolism
e. Myocardial infarction

305. Salicylic acid and its derivatives are widely used in medicine. This compound belongs to the following class of chemicals:
a. Aldehydes
b. Heterocyclic compounds
c. Alcohols
d. Hydroxycarboxylic acids
e. Alkanes

306. Which one of the listed ions has the greatest mobility?
a. H_3O^+
b. CN^-
c. K^+
d. Cl^-
e. Na^+

307. Examination of a sputum sample obtained from a patient provisionally diagnosed with tuberculosis revealed thin, long, slightly curved, rod-shaped microorganisms in the specimen. The microorganisms were stained ruby-red and arranged in strands. What staining method was used in this case?
a. Gram
b. Ozheshko
c. Ziehl-Neelsen
d. Romanowsky-Giemsa
e. Loeffler

308. What substance causes impaired biotin absorption?
a. Transferrin
b. Avidin
c. Globulin
d. Ferritin
e. Albumin

309. Colloidal systems are widely used in medicine. In emulsions:

a. Dispersed medium - gas, continuous medium - solid
b. Dispersed medium - gas, continuous medium - liquid
c. Dispersed medium - liquid, continuous medium - solid
d. Dispersed medium - liquid, continuous medium - liquid
e. Dispersed medium - liquid, continuous medium - gas

310. Phosphorylation reactions in the cell are catalyzed by enzymes that have the trivial name of "kinases". What class of enzymes do they belong to?
a. Isomerases
b. Oxidoreductases
c. Ligases
d. Lyases
e. Transferases

311. A skin area turned red after an exposure to high temperature. What local circulatory disorder can be observed in the focus of the acute inflammation, resulting in the ''rubor''?
a. Thrombosis
b. Arterial hyperemia
c. Ischemia
d. Stasis
e. Venous hyperemia

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

313. The patient's diuresis decreased to 800 mL per 24 hours. Such change in urine output is called:
a. Polyuria
b. Anuria
c. Oliguria
d. Proteinuria
e. Leukocyturia

314. A patient suffers from Down's disease that manifests as mental retardation, shortness of stature, pathologically short fingers and toes, and eyes with mongoloid slant. Karyotype analysis revealed trisomy 21. What group of diseases does this pathology belong to?
a. Gametopathy
b. Molecular genetic disease
c. Fetopathy
d. Chromosomal disorders
e. Blastopathy

315. What method is used for the quantification of ammonia?
a. Complexonometry
b. Alkalimetry, direct titration
c. Acidimetry, direct titration
d. Alkalimetry, back titration
e. Acidimetry, back titration

316. A sample obtained from the wound of a patient with suspected gas anaerobic infection was inoculated on the Kitt-Tarozzi medium. Why must this medium be heated before the inoculation?
a. To sterilize the medium
b. To enrich the medium with carbon dioxide
c. To dissolve salts
d. To remove oxygen

e. To destroy microorganisms

317. What drug can be classified as an angiotensin-converting enzyme blocker based on its mechanism of action?
a. Furosemide
b. Valsartan
c. Benzohexonium
d. Verapamil
e. Lisinopril

318. In the drug manufacture it is necessary to follow a complex of measures aimed at prevention of their microbial contamination. What is the name of this complex of measures?
a. Deratisation
b. Asepsis
c. Sterilization
d. Antisepsis
e. Disinfection

319. A patient has been prescribed oral drug to treat diarrhea. In accordance with the WHO and Pharmacopoeia requirements 1 g (ml) of drug can contain the following number of microorganisms:
a. 10 bacteria and no mold fungi
b. 1000 bacteria and 200 mold fungi
c. No bacteria and no mold fungi
d. 100 bacteria and 10 mold fungi
e. 1000 bacteria and 100 mold fungi

320. Leaves of a Lamiaceae family plant are ovate, with a crenate margin, darker on the top than on the bottom, and have a characteristic lemon-like smell. These are the features of the following plant:
a. Mentha piperita
b. Leonurus cardiaca
c. Lamium album
d. Salvia officinalis
e. Melissa officinalis

321. What kind of ground (functional) tissue is characteristic of above-ground organs of succulent plants, Cactaceae in particular?
a. Folded parenchyma
b. Starch storage parenchyma
c. Hydroparenchyma
d. Aerenchyma
e. Spongy parenchyma

322. What two working solutions are used in determination of hydrogen sulfide in mineral waters by means of iodometry (back titration)?
a. Na_2CO_3, HCl
b. NaOH, HCl
c. I_2, Na_2S_2O_3
d. H_2C_2O_4, KMnO_4
e. AgNO_3, H_2SO_4

323. Acetylsalicylic acid is used in treatment of rheumatism. What biochemical links are affected by acetylsalicylic acid?
a. Inhibits glycolysis
b. Stimulates prostaglandines synthesis
c. Stimulates cholesterol synthesis
d. Inhibits prostaglandines synthesis
e. Stimulates gluconeogenesis

324. What solution is used to standardize the silver(I) nitrate titrant solution in Mohr's method?

a. Sodium tetraborate solution
b. Sodium oxalate solution
c. Sodium carbonate solution
d. Sodium chloride solution
e. Potassium dichromate solution

325. Upon taking a herbal medicine, a 30-year-old patient has developed anaphylactic allergic reaction. Blood leukocytosis was observed. What kind of leukocytosis is characteristic of this case?
a. Lymphocytosis
b. Monocytosis
c. Basophilia
d. Heutrophilia
e. Eosinophilia

326. Emulsions, ointments, pastes, etc., can be made by comminuting solids and liquids in a suitable medium. This process is called:
a. Dispersion
b. Condensation
c. Adhesion
d. Coagulation
e. Sedimentation

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

328. High-molecular substances can be isolated from the solution using electrolytes. Name this process.
a. Coagulation
b. Swelling
c. Aggregation
d. Salting out
e. Sedimentation

329. Most often, the quantitative content of primary and secondary aromatic amines in drugs is determined using the following method:
a. Cerimetry
b. Titanometry
c. Ascorbinometry
d. Permanganatometry
e. Nitritometry

330. An elderly patient has developed postoperative intestinal atony. What anticholinesterase drug should be prescribed?
a. Pilocarpine hydrochloride
b. Metoprolol
c. Atropine sulfate
d. Proserin
e. Dithylinum (Suxamethonium chloride)

331. A pharmacy network is supplied with significant amount of sterile medical products (bandages, rubber gloves, catheters, etc.). What ensures their sterility during manufacturing?
a. Beta irradiation
b. Infrared irradiation
c. Alpha irradiation

d. Gamma irradiation
e. Ultraviolet irradiation

332. Cholesterol synthesis inhibitors are used as antiatherosclerotic drugs. Select one such drug from the list:
a. Sulfanilamide
b. Chloramphenicol
c. Pancreatin
d. Benzylpenicillin
e. Lovastatin

333. What is the name of the lower expanded hollow part of the pistil that contains ovules in a flower?
a. Ovary
b. Receptacle
c. Gynoecium
d. Stigma
e. Style

334. The population is being vaccinated for specific disease prevention. What type of immunity is developed as the result of this vaccination?
a. -
b. Artificially acquired passive
c. Naturally acquired passive
d. Artificially acquired active
e. Naturally acquired active

335. Examination of a patient detects excessive growth of bones and soft tissues of the face, enlarged tongue and internal organs, and widened interdental spaces. The patient's condition could have been caused by increased secretion of a certain hormone. Name this hormone.
a. Adrenaline
b. Vasopressin
c. Thyroxine
d. Somatotropin
e. Prolactin

336. What product is formed during the Wagner reaction, when alkenes are being oxidired with potassium permanganate in an aqueous medium?
a. Carboxylic acid
b. Aldehyde
c. Glycol
d. Epoxide
e. Ketone

337. A pregnant woman has received intravenously a uterotonic to stimulate uterine activity. This drug is a synthetic analog of a hormone of the posterior pituitary. Name this drug:
a. Folliculin (Estrone)
b. Oxytocin
c. Anaprilin (Propranolol)
d. Dinoprost
e. Proserin

338. During the microbiological diagnostics of syphilis, it became necessary to study the nature and degree of mobility of the causative agent. What type of microscopy is used for this purpose at a bacteriological laboratory?
a. Electron microscopy
b. Fluorescent microscopy
c. Dark-field microscopy
d. Light-field microscopy
e. X-ray microscopy

339. Enteral lipid metabolism is possible only under a certain set of conditions. What substance of those named below provides for emulsification of lipids, activation of lipase and absorption of fatty acids?
a. Hydrochloric acid
b. Glucose
c. Cholesterol
d. Bile acid
e. Amino acids

340. A quantity of medicine expressed in units of mass (milligram, gram), volume, or bioactivity (units of activity) is called:
a. Dosage form
b. Speed of action
c. Dose
d. Effectiveness
e. Therapeutic index

341. A Polygonaceae family plant has elongated lanceolate leaves with ochreae and brown spots on the upper surface of the leaf blade. These features are characteristic of:
a. Polygonum hydropiper
b. Hypericum perforatum
c. Polygonum aviculare
d. Polygonum persicaria
e. Leonurus quinquelobatus

342. Molecular absorption analysis is based on the Beer–Lambert–Bouguer law. According to this law, optical density of a solution is:
a. Directly proportional to the concentration and inversely proportional to the layer thickness
b. Directly proportional to the concentration and inversely proportional to the monochromatic light absorption index
c. Directly proportional to the layer thickness and concentration of the substance
d. Directly proportional to the layer thickness and monochromatic light absorption index
e. Inversely proportional to the layer thickness and concentration of the substance

343. What nonsteroidal anti-inflammatory drug selectively inhibits COX-2 and has no ulcerogenic effect?
a. Acetylsalicylic acid
b. Diclofenac sodium
c. Ibuprofen
d. Paracetamol
e. Celecoxib

344. A woman presents with poor twilight vision and dry conjunctiva and cornea. What vitamin deficiency can cause such disorders?
a. C
b. A
c. B_12
d. B
e. D

345. One week after an inpatient treatment with penicillin, a microorganism that was initially susceptible to this antibiotic developed a resistance to penicillin, tetracyclines, aminoglycosides, and macrolides. What mechanism of antibiotic resistance formation is observed in this case?
a. Mutational
b. R-plasmid
c. Natural selection
d. Spontaneous
e. Phenotypic

346. According to the Smoluchowski theory of rapid coagulation, the coagulation process can be described using the following type of kinetic equation:
a. First-order equation
b. Fractional-order equation
c. Third-order equation
d. Second-order equation
e. Zero-order equation

347. Nuciform fruits include a certain type of one-seeded fruit that does not burst when ripe. Its base is enclosed in a cup-shaped cupule formed by the broad part of the peduncle to which the flower was attached. Name this type of fruit:
a. Acorn
b. Samara
c. Nut
d. Nutlet
e. Caryopsis

348. After obtaining an antitoxic serum, its activity must be determined. For this purpose, one needs to use a reaction that is based on a combination of equal doses of immune serum and anatoxin. Name this reaction.
a. Complement fixation
b. Hemadsorption
c. Hemagglutination
d. Precipitation
e. Flocculation

349. What is the mechanism of action of the antiviral drug acyclovir?
a. Increase of cellular membrane permeability
b. Inhibition of nucleic acid synthesis
c. Inhibition of protein synthesis
d. Antagonism with para-aminobenzoic acid
e. Blockade of cellular wall synthesis

350. Blood test is as follows: erythrocytes - 1,5cdot 10^12/l; hemoglobin - 60 g/l; blood color index - 1,4; leukocytes - 3,0cdot 10^9/l, thrombocytes - 1,2cdot 10^10/l, reticulocytes - 0,2%. Blood smear revealed Jolly bodies, Cabot rings, megalocytes. What type of anemia does the patient have?
a. B_12 and folic acid deficiency anemia
b. Iron deficiency anemia
c. Iron refractory anemia
d. Hemolytic anemia
e. Hypoplastic anemia

351. 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. Carbonic anhydrase
b. Tyrosinase
c. Hexokinase
d. Histidine decarboxylase
e. Arginase

352. What forms of erythrocytes will be observed in a case of B_12 deficiency anemia?
a. Normocytes
b. Ovalocytes
c. Megalocytes
d. Annulocytes (Codocytes)
e. Microcytes

353. What analytical effect is observed when a solution that contains acetate ions is heated with ethyl

alcohol and concentrated sulfuric acid?
a. Formation of a blue precipitate
b. Formation of a black precipitate
c. Formation of a white precipitate
d. Release of a characteristic odor
e. Formation of a yellow precipitate

354. In a maternity hospital infants are vaccinated against tuberculosis on the 5-7 day. What vaccine is used specifically for prevention of tuberculosis?
a. BCG vaccine
b. STI vaccine
c. TABTe vaccine
d. DPT vaccine
e. EV vaccine

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

356. Malignant tumors have a number of morphological and functional characteristics that differ them from benign ones. What is typical only of malignant tumors?
a. Only local influence
b. Low degree of cell differentiation
c. No metastases
d. Expansive growth
e. No recurrences

357. A pharmacy produces a batch of vials with physiological saline for injections. How should they be sterilized?
a. In a steam-jacketed autoclave chamber
b. Ultraviolet irradiation
c. Under pressure in an autoclave
d. In a dry heat sterilizer
e. X-ray irradiation

358. A certain dioecious plant commonly grows at the forest edge. It is a shrub with thorned sprouts. Its fruit is a round black coenocarpous drupe (pyrenarium) with 3-4 seeds. Name this plant:
a. Rhamnus cathartica
b. Crataegus sanguinea
c. Rosa canina
d. Hippophae rhamnoides
e. Sambucus nigra

359. A patient suffers from block of cytochrome oxidase enzyme caused by cyanide poisoning. What type of hypoxia is developed in this case?
a. Tissue
b. Circulatory
c. Stagnant
d. Respiratory
e. Hemic

360. An anxiolytic agent, a benzodiazepine derivative, was prescribed to a patient with a neurosis in order to reduce its signs. What medicine belongs to this group of drugs?
a. Atropine sulphate
b. Nandrolone
c. Piroxicam

d. Trihexyphenidyl
e. Diazepam

361. Neutralization of drugs, particularly sulfonamides, in the liver occurs by means of acetylation. Name the compound that causes acetylation reaction:
a. Succinyl-CoA
b. Glutathione
c. Glycine
d. Acetyl-CoA
e. S-adenosylmethionine

362. A diagnostic feature important for correct identification of pine species is the number of needles on the short shoots (brachyblasts). Pinus sylvestris has the following number of needles on its short shoots:
a. 8
b. 2
c. 3
d. Many
e. 5

363. In cases of systemic connective tissue diseases, protein and polysaccharide fragments of the connective tissue become destroyed. What protein is the main component of this tissue?
a. Myosin
b. Collagen
c. Keratin
d. Actin
e. Albumin

364. Which pair of substances can produce an emulsion when mixed together?
a. Urea and water
b. Silicon dioxide and water
c. Soybean oil and water
d. Menthol and camphor
e. Silver nitrate and water

365. Sputum analysis by means of flotation and Ziehl-Neelsen staining technique revealed red long thin bacilli, both isolated and arranged in clusters. What disease is caused by this pathogen?
a. Actinomycosis
b. Tuberculosis
c. Tularemia
d. Diphtheria
e. Pertussis

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

367. What drug can be used to stop a bronchospasm?
a. Amoxicillin
b. Atenolol
c. Salbutamol
d. Omnoponum
e. Aspirin

368. Bacteria eventually become resistant to antibacterial agents. What enables gram-positive

bacteria's resistance to penicillin antibiotics?
a. Active transport of antibiotics
b. Cell wall permeability
c. Active synthesis of peptidoglycane
d. Beta-lactamases production
e. Protein synthesis

369. 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. Hemoglobin
b. Urea
c. Bilirubin
d. Insulin
e. Adrenaline

370. A patient with heart failure has developed acute edematous syndrome. What drug should be prescribed to make the edemas recede?
a. Nitroglycerine
b. Furosemide
c. Nifedipine
d. Panangin (Potassium aspartate and magnesium aspartate)
e. Propranolol

371. What electrophilic reagent is used for sulfonation of pyrrole and furan?
a. Concentrated sulfuric acid
b. Mixture of sulfuric acid and nitric acid
c. Pyridine-sulfur trioxide complex
d. Diluted sulfuric acid
e. Oleum

372. What compound has no carboxyl group but nevertheless is called an acid?
a. Tartaric acid
b. Valeric acid
c. Lactic acid
d. Malic acid
e. Picric acid

373. 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 side-effect:
a. Sensibilization
b. Habituation
c. Dysbacteriosis
d. Dependence
e. Cumulation

374. Name the method of binding foreign ions in an analysis:
a. Analytical separation
b. Analytical concentration
c. Analytical extraction
d. Analytical coprecipitation
e. Analytical masking

375. How does the value of the critical micelle concentration in homologous series change with an increase in the molecular mass of the surfactant?
a. Sharply increases
b. Reaches its maximum and then decreases
c. Remains unchanged

d. Increases
e. Decreases

376. Quantitative content of oxalic acid can be determined by means of permanganatometry. How to determine equivalence point for this kind of titration?
a. With redox indicator diphenylamine
b. With specific indicator
c. With adsorption indicator
d. With pH indicator
e. When titrate changes its color after another drop of process solution is added

377. A patient is being consulted by the family doctor. He asks what role cholesterol plays in the body. The doctor explains that cholesterol is a constituent part of the cell membranes and is necessary for synthesis of various substances, among which there are following hormones:
a. Peptide hormones
b. Eicosanoids
c. Amino acid derivatives
d. Steroid hormones
e. Protein hormones

378. A child that attends a day care center fell ill with measles. What is used to prevent this disease in the contact persons?
a. Sulfanilamides
b. Measles vaccine
c. Immunostimulants
d. Antibiotics
e. Measles immunoglobulin

379. What drug must be prescribed to treat a patient with malaria?
a. Sulfamethoxazole
b. Chloramine
c. Tetracycline
d. Chingamine (Chloroquine)
e. Ceftriaxone

380. In potentiometric titration the following indicator electrode is used for chloride and borate acids quantitative determination in their mixture:
a. Silver-chlorine
b. Platinum
c. Calomel
d. Glass
e. Silver

381. L-DOPA and its derivatives are used in treatment of Parkinson's disease. What aminoacid is this substance made of?
a. Tyrosine
b. Glutamate
c. Tryptophan
d. Arginine
e. Asparagine

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

383. Lecithin of various origins, being a surfactant compound, is used in food industry as emulsifying agent. What group of biomolecules does it belong to?

a. Phospholipids
b. Triacylglycerols (triglycerides)
c. Glycolipids
d. Sterol esters
e. Sulfolipid

384. Dopplerography detected bilateral stenosis of renal arteries in a patient with the blood pressure of 180/100 mm Hg. Activation of what system is the most likely cause of the persistently elevated blood pressure in this case?

a. Renin-angiotensin-aldosterone system
b. Hypothalamic-pituitary-adrenal axis
c. Kinin-kallikrein system
d. Central nervous system
e. Sympathoadrenal system

385. Biological fluids (sera, enzyme and vitamine solutions, etc.) are vulnerable to high temperatures, which is why they are sterilized under the temperature of 56--58^oC. They are heated 5--6 times, with 24-hour-long intervals between them. What sterilization method is it?

a. Flaming
b. Pasteurization
c. Moist heat sterilization
d. Tyndallization
e. Autoclaving

386. What pharmacological effect of acetylsalicylic acid allows its application in patients with ischemic heart disease for prevention of thromboses?

a. Analgesic
b. Ulcerogenic
c. Antipyretic
d. Antiaggregant
e. Anti-inflammatory

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

a. Bidens tripartita
b. Gnaphalium uliginosum
c. Echinops ritro
d. Centaurea cyanus
e. Arnica montana

388. The prosess of one substance drawing the other in only with its surface is called:

a. Coagulation
b. Desorption
c. Chemisorption
d. Adsorption
e. Absorption

389. A structural analog of vitamin PP (nicotinic acid) is used as an antituberculous medicine. Name this medicine:

a. Isoniazid
b. Streptocide
c. Aspirin
d. Riboflavin
e. Tetracycline

390. What reaction can be used to distinguish propyne from propene?

a. Decoloration of KMnO_4 solution
b. Decoloration of bromine water solution
c. Wurtz's reaction
d. Polymerization
e. Formation of acetylenides

391. To quickly relieve the state of acute psychosis, the patient was prescribed a rapid/short-acting psychotropic drug. Name this drug:
a. Valerian extract
b. Droperidol
c. Caffeine and sodium benzoate
d. Amitriptyline
e. Piracetam

392. Smears prepared from the cerebrospinal fluid sediment and stained using the Gram technique are studied in diagnostics of meningitis. What finding confirms the diagnosis of meningococcal infection?
a. Gram-positive diplococci located inside leukocytes
b. Lancet-shaped Gram-positive diplococci
c. Gram-negative coccobacteria located inside leukocytes
d. Diplococci enclosed within a capsule
e. Gram-negative diplococci located inside leukocytes and outside of them

393. Choose the weakest carboxylic acid basing on its pKa value:
a. Propionic acid (pKa = 4.9)
b. Butyric acid (pKa = 4.82)
c. Formic acid (pKa = 3.7)
d. Acetic acid (pKa = 4.7)
e. Lactic acid (pKa = 3.9)

394. Nitrite ions can be detected in the presence of nitrate ions using the following:
a. Crystalline iron (III) sulfate
b. Crystalline antipyrine in the presence of diluted HCl
c. Crystalline sodium thiosulfate
d. Dimethylglyoxime
e. Diphenylcarbazone

395. A child with mental retardation is diagnosed with cretinism. What hormone deficiency is the main factor in the development of nervous system dysfunction in this disease?
a. Glucocorticoids
b. Catecholamines
c. Thyroid hormones
d. Estrogens
e. Androgens

396. After acute nitrite poisoning, the patient was diagnosed with acquired toxic hemolytic anemia. A large amount of regenerative forms of erythrocytes were detected in the patient's blood smear. Name these cells.
a. Microcytes
b. Reticulocytes
c. Drepanocytes
d. Schistocytes
e. Annulocytes (Codocytes)

397. Osmotic pressure is an important characteristic of biological fluids. Semipermeable membranes are necessary for penetration of solvent molecules. What substance textbfCANNOT be used as a semipermeable membrane?
a. Glass
b. Parchment

c. Biological membrane
d. Gelatine
e. Collodion film

398. What solution has the highest osmotic pressure at the temperature of 298 K?
a. Urea solution
b. Sodium benzoate solution
c. Aluminum sulfate solution
d. Sodium sulfate solution
e. Glucose solution

399. A 48-year-old patient has been intravenously administered prednisolone solution to arrest severe attack of bronchial asthma. What group of hormonal agents does prednisolone belong to?
a. Gestagenic drugs
b. Mineralocorticoid
c. Anabolic steroids
d. Glucocorticoids
e. Estrogenic drugs

400. Antiparkinsonian drugs are classified based on the mechanism of their action in the body. What drug is a dopamine precursor?
a. Bromocriptine
b. Midantan (Amantadine)
c. Selegiline
d. Cyclodol (Trihexyphenidyl)
e. Levodopa

401. 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. Chronic posthemorrhagic
b. Acquired hemolytic
c. Iron-deficiency
d. Hereditary hemolytic
e. B_12-folic acid deficiency

402. A 70-year-old man with atherosclerosis complains of tinnitus both in the ears and in the head, memory deterioration, loss of working ability, and rapid fatigability. What arteries are the most affected in this man?
a. Intestinal arteries
b. Cerebral arteries
c. Coronary arteries
d. Lower limb arteries
e. Renal arteries

403. Choose the potent fast-acting diuretic to induce forced diuresis:
a. Hydrochlorothiazide
b. Acetazolamide
c. Triamterene
d. Spironolactone
e. Furosemide

404. Due to a case of diphtheria in the kindergarten, all the children and personnel undergo examination for early detection of the disease and its carriers. What material must be taken for analysis?
a. Pharyngeal and nasal swabs
b. Wound material
c. Blood
d. Pharyngeal swab

e. Nasal swab

405. A plant has floating leaves with thick leathery cuticle, stratified columnar parenchyma, and spongy parenchyma with large intercellular spaces. Only the upper epidermis has stomata in it. This plant is a:
a. Heliophyte
b. Xerophyte
c. Sciophyte
d. Hydrophyte
e. Mesophyte

406. Investigation of bacterial contamination of indoor air in a pharmacy takes into account the total number of microorganisms present in a certain air volume, as well as qualitative content of indoor air microflora. Name the sanitary-indicative microorganisms for indoor air:
a. Chromobacterium
b. Sarcina
c. Fungi and yeasts
d. Staphylococcus and streptococcus
e. Colibacillus

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

408. A patient presents with persistent fever, with the difference between evening and morning temperature not exceeding 1^oC) What type of fever curve is present in this patient?
a. Continuous
b. Hectic
c. Remittent
d. Recurrent
e. Intermittent

409. To treat glaucoma a doctor made a decision to prescribe a cholinomimetic agent of direct action. Name this drug:
a. Atropine sulfate
b. Zinc sulfate
c. Pilocarpine hydrochloride
d. Platyphylline hydrotartrate
e. Sulfacyl-sodium (Sulfacetamide)

410. During analysis of a herbal raw material, a culture was grown on a nutrient medium. The culture looks like a black furry plaque. Unseptated mycelial filaments with spherical thickenings at their ends were found in the smear preparations. Name these microorganisms:
a. Aspergillus
b. Penicillium
c. Candida
d. Mucor
e. Actinomyces

411. A patient in a state of psychosis was prescribed the following antipsychotic:
a. Diazepam
b. Aminazine (Chlorpromazine)
c. Caffeine
d. Cyclodol (Trihexyphenidyl)
e. Phenobarbital

412. Chromatographic analysis methods differ in their mechanism of sorbent-sorbate interaction. What partition mechanism is used in ion-exchange chromatography?
a. Solutes and sorbent producing precipitates of different solubility
b. Different ion-exchange capacity of the substances
c. Different solubility of the solutes in the stationary phase
d. Production of coordination compounds of different stability in the phase or on the sorbent surface
e. Different adsorption capacity of the solid sorbent towards different substances

413. A plant has roots with bacteriorhiza, complex leaves with stipules, flowers with a papilionaceous corolla, and a silique fruit. These features are characteristic of the following family:
a. Solanaceae
b. Fabaceae
c. Apiaceae
d. Lamiaceae
e. Asteraceae

414. What device is used to measure surface tension of a liquid?
a. Nephelometer
b. Stalagmometer
c. Viscometer
d. Calorimeter
e. Areometer

415. After examination, the patient was diagnosed with alkaptonuria. What enzyme is deficient in this case, causing this pathology?
a. Homogentisic acid oxidase
b. Monoamine oxidase
c. Tyrosinase
d. Phenylalanine hydroxylase
e. Thyroxine hydroxylase

416. What local anesthetic is used to treat ventricular arrhythmia?
a. Anesthesin (Benzocaine)
b. Lidocaine hydrochloride
c. Ropivacaine
d. Ultracaine
e. Bupivacaine

417. Select from the list an antiprotozoal drug with an anti-Helicobacter pylori effect.
a. Rifampicin
b. Isoniazid
c. Aciclovir
d. Benzylpenicillin sodium salt
e. Metronidazole

418. Interaction between dispersed phase and dispersion medium is different for different systems. If dispersed phase has low interaction with medium, the system is called:
a. Hydrophilic
b. Free disperse
c. Bound disperse
d. Lyophobic
e. Lyophilic

419. A poisonous weed of the Solanaceae family has branching downy stems. Its leaves are soft, dull, and dark green; on their lower surface they are light gray, with thicker and longer down along their veins and edges. The flowers are sessile, with a deciduous five-lobed funnelform corolla that is colored dirty yellow (rarely whitish) and has a network of purple-violet veins. The fruit is an urceolate capsule with an operculum. These features are characteristic of:
a. Atropa belladonna

b. Datura innoxia
c. Datura stramonium
d. Nicotiana tabacum
e. Hyoscyamus niger

420. Examination of children with kwashiorkor revealed facial edema, ascites, weight loss, and stunted growth. What is the most likely cause of this disease?
a. Carbohydrate deficiency
b. Excess protein in the diet
c. Excess fats and carbohydrates
d. Alimentary protein deficiency
e. Deficiency of unsaturated fatty acids

421. In the patient's blood plasma there are high levels of low-density and very low-density lipoproteins. These changes can indicate the following pathology:
a. Gout
b. Atherosclerosis
c. Leukaemia
d. Jaundice
e. Arthrosis

422. After a stroke the patient should be prescribed a drug that would increase energy transfer in the brain cells and stimulate the central nervous system. Name this drug:
a. Ketorolac
b. Phenobarbital
c. Piracetam
d. Phenazepam
e. Doxylamine

423. What carboxylic acid is an aromatic monocarboxylic acid and can be used in treatment of skin diseases as an external antiseptic and fungicide?
a. Valeric acid
b. Butyric acid
c. Benzoic acid
d. Formic acid
e. Acetic acid

424. A patient has bradycardia, moderate hypotension, decreased basal metabolism, and edemas. What disorder is the likely cause of these signs?
a. Hyperthyroidism
b. Hyperparathyroidism
c. Hypoparathyroidism
d. Hypothyroidism
e. Adrenal hypofunction

425. Cerebrospinal fluid of a patient diagnosed with meningitis was taken for analysis. To detect the causative agent the sample was inoculated in a nutrient medium. Prior to that a serum had been added to the medium. What causative agent is expected to be obtained in this case?
a. Mycobacteria
b. Viruses
c. Rickettsia
d. Staphylococcus
e. Meningococcus

426. Alkaline hydrolysis of esters (complex ethers) is called:
a. Rearrangement
b. Etherification
c. Condensation
d. Saponification

e. Oxidation

427. After an acute myocardial infarction, the doctor recommended the patient to take acetylsalicylic acid in the dose of 80--100 mg for 3 months. The doctor expects this drug to have the following effect in this case:
a. Analgesic
b. Spasmolytic
c. Anti-inflammatory
d. Antiplatelet
e. Antipyretic

428. What disaccharide is a reducing one?
a. Maltose
b. Starch
c. Sucrose
d. Cellulose
e. Ribose

429. When determining substances by means of mercurimetric titration, the following solution is used as a titrant:
a. Mercury(I) nitrate
b. Mercury(II) nitrate
c. Ammonium thiocyanate
d. Silver(I) nitrate
e. Potassium iodide

430. Bactericidal drug rivanol contains the following heterocyclic structure:
a. Isoquinoline
b. Anthracene
c. Quinoline
d. Acridine
e. Phenanthrene

431. Which medicine of those listed below is the least active among the local anesthetics, poorly dissolves in water, and can be used for topical anesthesia in the form of ointments, pastes, and powders?
a. Lidocaine
b. Novocaine (Procaine)
c. Ropivacaine
d. Ultracaine (Articaine)
e. Anesthesin (Benzocaine)

432. Name the ability of a drug to accumulate within the patient's body:
a. Cumulation
b. Allergy
c. Antagonism
d. Habituation
e. Synergism

433. A man with allergic dermatitis and disturbed sleep came to a doctor. What antihistamine would be optimal in this case?
a. Ampicillin
b. Loratadine
c. Enterosgel (Polymethylsiloxane polyhydrate)
d. Dimedrol (Diphenhydramine)
e. Dexamethasone

434. A starch molecule contains residues of a certain monosaccharide. Name this monosaccharide.
a. D-fructose

b. D-mannose
c. D-glucose
d. D-galactose
e. D-ribose

435. What short-acting loop diuretic can cause significant hypokalemia?
a. Spironolactone
b. Triamterene
c. Mannitol
d. Furosemide
e. Amiloride

436. When smeared with turpentine, the rabbit's tongue turns red and its blood supply increases. What type of arterial hyperemia occurs in this case?
a. Work hyperemia
b. Neurotonic hyperemia
c. Reactive hyperemia
d. Neuroparalytic hyperemia
e. Metabolic hyperemia

437. To create a vaccine for hepatitis B prevention the gene responsible for HBsAg production was integrated into the genome of vaccinia virus. What type of vaccine is obtained in this way?
a. Synthetic
b. Chemical
c. Inactivated
d. Anatoxin
e. Genetically engineered vaccine

438. What drug selectively suppresses the secretion of the gastric glands by blocking H_2-histamine receptors?
a. Ipratropium bromide
b. Omeprazole
c. Famotidine
d. Loratadine
e. Atropine sulfate

439. Medical school graduates have received active immunization against hepatitis B, because doctors are at greater risk of contracting this disease. Name the main transmission route of this pathogen:
a. Alimentary transmission
b. Contact transmission
c. Waterborne transmission
d. Parenteral transmission
e. Airborne droplet transmission

440. To introduce a medicine into the body through the airways, the following type of substance must be used:
a. Ointment
b. Aerosol
c. Foam
d. Emulsion
e. Suspension

441. Adrenaline is used to prolong the action of novocaine (procaine) during infiltration anesthesia. What effect of adrenaline provides this prolongation?
a. Inhibition of tissue esterases
b. Functional suppression of nerve endings and conductors
c. Vasoconstriction
d. Vasodilation

e. Potentiation of novocaine (procaine) action at the level of central nervous system

442. All strong electrolytes cause sol coagulation, if added to a sol in a sufficient amount. The coagulant ion in this case is a particle with the charge that is:
a. Opposite to the counterions of the adsorption layer
b. Identical to the charge of the colloidal particle
c. Identical to potential-determining ions
d. Identical to the charge of the nucleus
e. Opposite to the charge of the colloidal particle

443. A patient with atherosclerosis was prescribed an antiatherosclerotic agent. Name this drug:
a. Dexamethasone
b. Fenofibrate
c. Ascorbic acid
d. Butadion (Phenylbutazone)
e. Piracetam

444. What electrochemical method of quantitative analysis is based on measuring the amount of electric current that has been used for electrochemical reduction or oxidation of ions or elements that are being determined in the process of electrolysis?
a. Conductometry
b. Coulometry
c. Potentiometry
d. Amperometry
e. Polarography

445. Fibrillar proteins can be characterized by the presence of several parallel polypeptide chains in their structure. What fibrillar protein is a component of hair, skin, and nails?
a. Albumin
b. Globulin
c. Prothrombin
d. Keratin
e. Histone

446. What drug is an H_2-histamine receptor blocker?
a. Allochol
b. Famotidine
c. Gastrotzepin (Pirenzepine)
d. Almagel
e. Omeprazole

447. During harvesting herbal raw materials, a marked mosaicism was noticed on the leaves of medicinal plants. What microorganisms cause this disease?
a. Viroids
b. Bacteria
c. Viruses
d. Microscopic fungi
e. Protozoa

448. A patient with essential hypertension is prescribed captopril. What is the mechanism of action of this drug?
a. Slow calcium channel block
b. beta-adrenoceptor block
c. alpha-adrenoceptor block
d. Angiotensin II receptor block
e. Inhibition of angiotensin-converting enzyme activity

449. As a result of an accident (snakebite) a male patient has the following blood values: Hb- 80 g/l, RBC- 3,0cdot10^12/l; WBC- 5,5cdot10^9/l. What type of anemia is observed in this case?

a. Posthemorrhagic
b. Hemolytic
c. Aplastic
d. Iron-deficiency
e. Folic acid-deficiency

450. In permanganatometry, KMnO_4 is used as a titrant. What is the equivalence factor of this compound, if the titration is performed in an acidic medium?
a. 1/5
b. 1/4
c. 1/3
d. 1/2
e. 1

451. It is known, that HIV infection leads to severe immunologic disturbances in the body that result in the development of AIDS (acquired immune deficiency syndrome). What cells of the human body are the most susceptible to HIV infection?
a. Hepatocytes
b. T helper cells
c. Suppressor T cells
d. B lymphocytes
e. Endotheliocytes

452. A case of hepatitis A was registered at a school. What drug should be used for specific prevention in the children, who were in a contact with the sick classmate?
a. Live vaccine
b. Immunoglobulin
c. Inactivated vaccine
d. Ribavirin
e. Interferon

453. Microscopy of a plant stem revealed a complex tissue, consisting of sieve-like tubes with satellite cells, bast fibers, and bast parenchyma. Name this tissue:
a. Xylem
b. Rhytidoma
c. Phloem
d. Epidermis
e. Periderm

454. Preliminary disinfection of air and working surfaces of the equipment was conducted in the operating room of the surgical inpatient unit. What method of sterilization would be the most advisable in this case?
a. Irradiation sterilization
b. Ultraviolet irradiation
c. Formaldehyde vapor
d. High-frequency current
e. Flowing steam

455. A student was asked, what additional functions of the root are associated with the accumulation of nutrients. These functions are:
a. Respiration
b. Symbiosis of the root and algae
c. Primary synthesis of organic substances
d. Maintaining the spatial position of a plant
e. Formation of storage roots and root tubers

456. A patient with symptoms of cardiac glycosides intoxication is prescribed Unithiol (Dimercaprol). What is the drug's mechansm of action?
a. Induction of cardiac glycosides metabolism

b. Binding ionized Ca^2+
c. Reactivation of membrane K^+, Na^+-adenosinetriphosphatase
d. Increase of K^+ penetration of myocardiocytes
e. Increase of Na^+ content in myocardium

457. On examination the doctor suspects Cushing syndrome in the patient. This preliminary diagnosis can be confirmed by elevated levels of the following substance in the patient's blood:
a. Cholesterol
b. Retinol
c. Cortisol
d. Tocopherol
e. Adrenaline

458. A patient has been diagnosed with ischemic heart disease with high cholesterol levels. What drug should be included into the patient's treatment regimen?
a. Celecoxib
b. Fentanyl
c. Hydrochlorothiazide
d. Diclofenac sodium
e. Atorvastatin

459. A diuretic should be prescribed for treatment of cerebral edema. What drug is to be administered?
a. Hydrochlorothiazide
b. Diacarb (Acetazolamide)
c. Spironolactone
d. Furosemide
e. Caffeine and sodium benzoate

460. A dissected flower has numerous stamens that are united by the stamen filaments into several bundles. What is this type of androecium?
a. Didynamous
b. Diadelphous
c. Polyadelphous
d. Monadelphous
e. Tetradynamous

461. Specific reactions used in qualitative analysis make it possible to:
a. Detect only anions
b. Detect an ion without previous separation of other ions
c. Detect an ion with previous separation
d. Detect only cations
e. Detect only a certain group of ions

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

463. A patient with diabetes mellitus presents with thirst, polyuria, and dry skin and mucosa. These signs are caused by the elevated levels of the following substance in the patient's blood:
a. Adrenaline
b. Glucose
c. Cholesterol
d. Phenylalanine
e. Urates (uric acid salts)

464. Halogen atoms can be detected in an organic compound, if the following test is performed:
a. Lucas' test
b. Beilstein's test
c. Iodoform test
d. Molisch's test
e. Baeyer's test

465. A patient has been hospitalized with the provisional diagnosis of gas gangrene, caused by spore-forming anaerobes. What nutrient medium must be used for inoculation of the material, obtained from the patient, to isolate a pure culture and confirm the diagnosis?
a. Kitt-Tarozzi medium
b. Meat-peptone agar, meat-peptone broth
c. Egg yolk-salt agar
d. Levin medium
e. Endo medium

466. A man with gout has a significant increase in blood levels of uric acid. Uric acid is an end product of the metabolism of:
a. Albumins
b. Fatty acids
c. Purine bases
d. Triglycerides
e. Globulins

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

468. In spring a perennial plant of Asteraceae family produces floral shoots with gloden-yellow flowers. After blossom-fall, shoots with large leaves appear. Name this plant:
a. Petroselinum crispum
b. Tussilago farfara
c. Datura stramonium
d. Potentilla erecta
e. Hipericum perforatum

469. A patient was prescribed doxycycline hydrochloride for etiopathogenetic treatment of an infectious process. In this case the patient should be warned about the following side efect:
a. Arterial hypertension
b. Uricosuria
c. Peripheral edemas
d. Photosensitization
e. Hypercapnia

470. When dividing cations into analytical groups according to the acid-base classification, the group reagents can be acids or bases. What acids are used as group reagents?
a. HCl, H_2SO_4
b. $HClO_4$
c. H_3PO_4, $H_2C_2O_4$
d. HNO_3, CH_3COOH
e. H_2CO_3

471. What reagent will allow for unsaturated organic compounds reduction under the conditions given below?
a. HNO_3, p, t

b. H_2, Ni, t
c. H_2O, Hg^2+, H^+
d. NaOH, H_2O
e. K_2Cr_2O_7, H^+

472. A patient with high fever and pain in throat when swallowing is diagnosed with tonsillitis. Which of the listed symptoms is a local feature of acute inflammation?
a. Tachycardia
b. Reddening
c. Fever
d. Leukocytosis
e. Increased ESR

473. Mercurometry is used for quantification of halide ions in their interaction with solutions of mercury salts (Hg_2^2+). What indicator allows analytical visualization of complete precipitation of halide ions?
a. Potassium dichromate
b. Diphenylcarbazone
c. Methyl orange
d. Eosin
e. Fluorescein

474. A person with carbon monoxide poisoning (CO) presents with disturbed consciousness and high levels of carboxyhemoglobin in blood. What type of hypoxia does this patient have?
a. Tissue
b. Circulatory
c. Hemic
d. Respiratory
e. Exogenic

475. Gelatin expands the most in the following solvent:
a. Diethyl ether
b. Ethanol
c. Acetic acid solution
d. Benzene
e. Water

476. From the patient's pleural cavity, an exudate sample was obtained. This sample has the following composition: protein -- 34 g/L, blood corpuscles -- 3600 in mcL, predominantly neutrophils, pH -- 6.8. What type of exudate is it?
a. Purulent
b. Fibrinous
c. Serous
d. Hemorrhagic
e. Mixed

477. What is the name of the single elongated crystals with pointed ends that can be detected during the microscopy of the herbal raw material harvested from a monocotyledonous plant?
a. Cystoliths
b. Styloids
c. Druses
d. Crystalline sand
e. Globoids

478. The breakdown of starch in the body is a catalytic process that occurs with the help of amylase. What type of catalysis is it?
a. Enzymatic catalysis
b. Autocatalysis
c. Redox catalysis

d. Acid-base catalysis
e. Heterogeneous catalysis

479. A patient with bronchial asthma was prescribed a drug to stop an attack of the disease. The drug's mechanism of action is based on stimulation of beta_2-adrenergic receptors primarily. Name this drug:
a. Isadrine (Isoprenaline)
b. Droperidol
c. Salbutamol
d. Clophelin (Clonidine)
e. Epinephrine hydrochloride

480. ACE inhibitors cannot be used simultaneously with a certain group of diuretics. Name this group of diuretics.
a. Osmotic diuretics
b. Carbonic anhydrase inhibitors
c. Thiazide diuretics
d. Potassium-sparing diuretics
e. Loop diuretics

481. Examination of a child revealed enlarged abdomen, curved legs, increased excitability of the nervous system, and increased excretion of phosphates with the urine. Deficiency of what food component can cause such clinical changes?
a. Vitamin D
b. Vitamin K
c. Vitamin A
d. Vitamin F
e. Vitamin C

482. By means of photoelectrocolorimetric analysis the concentration of the following can be determined:
a. Any type of solution
b. Turbid solution
c. Optically active substance
d. Colored solution
e. Colorless solution

483. According to the Bancroft's rule, the dispersion medium of an emulsion will be the liquid, with which the emulsifier:
a. Forms a colored compound
b. Chemically interacts
c. Forms a precipitate
d. Has affinity
e. Forms an insoluble compound

484. In the postoperative period, the patient was receiving an antibiotic. Over time, the patient started complaining of impaired hearing and vestibular disorders. What group of antibiotics has such side effects?
a. Aminoglycosides
b. Tetracyclines
c. Macrolides
d. Penicillins
e. Cephalosporins

485. Name the primary drug of choice for treatment of narcotic analgesics overdose.
a. Naloxone
b. Caffeine and sodium benzoate
c. Calcium chloride
d. Unithiol (Dimercaprol)

e. Diazepam

486. Classification of anions is based on different solubility of their salts with Ba^2+ and Ag^+ ions. Anions of the 1st analytical group form salts poorly soluble in water with the following ions:
a. Ag^+ (acid medium)
b. Ag^+ (alkaline medium)
c. Ag^+ (neutral medium)
d. Ba^2+ (alkaline or neutral medium)
e. Ag^+ (ammonia buffer medium)

487. When dosage forms are being tested by accelerated aging method, it is assumed that decomposition reaction of the active substance is of the following order:
a. Zero-order
b. Second-order
c. Reaction order does not matter
d. First-order
e. Third-order

488. 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

489. A doctor has prescribed metoprolol to a person with essential hypertension. As a result of abrupt cessation of treatment, the patient's blood pressure increased. What pathological condition did the patient develop?
a. Withdrawal syndrome
b. Idiosyncrasy
c. Allergic reaction
d. Drug allergy
e. Pharmacotoxic response

490. Heparin is a potent natural anticoagulant, synthesized in mast cells. What is the chemical nature of this compound?
a. Homopolysaccharide
b. Heteropolysaccharide
c. Steroid
d. Phospholipid
e. Simple protein

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

492. The structure of the bacterial cell that provides microbes with increased resistance to the environmental factors and can remain intact for a long time can be detected by staining a smear according to the Ozheshko technique. What is this structure called?
a. Spore
b. Flagella
c. Pilus
d. Plasmid

e. Capsule

493. It is determined that genetic basis of extrachromosomal stability is defined by the elements containing genes that provide for cell resistance to certain drugs, primarily antibiotics. What elements are these?
a. Golgi apparatus
b. Mitochondrion
c. Nucleoid
d. Cytoplasm
e. R-plasmids

494. At what temperature should the determination be carried out in refractometric method of analysis?
a. 18^oC
b. 28^oC
c. 23^oC
d. 20^oC
e. 25^oC

495. Enzymes accelerate biochemical reactions, making them occur more than 10^8 times faster. What equation describes the rate of enzyme catalysis?
a. Van't Hoff equation
b. Law of mass action
c. Van't Hoff reaction isotherm
d. Michaelis-Menten equation
e. Arrhenius equation

496. A ready-made drug was inoculated on Sabouraud's agar and incubated under 22^oC for 5 days. This nutrient medium was used to determine the following:
a. Presence of E) coli
b. Number of mold and yeast fungi
c. Total number of bacteria
d. Presence of S. aureus
e. Presence of Salmonella

497. Select the hepatoprotective drugs from the list below:
a. Allochol, Cholenzym
b. Festal, Panzinorm (Pancreatin)
c. Essentiale (Phospholipides), Thiotriasoline
d. No-Spa (drotaverine), papaverine hydrochloride
e. Oxaphenamide (Osalmid), Nicodin

498. What solution can be determined by the photocolorimetric method measuring self-absorbance?
a. Potassium chromate
b. Potassium chloride
c. Potassium sulphate
d. Potassium nitrate
e. Potassium phosphate

499. What characteristic is used in titrimetric methods of analysis, when choosing the indicator?
a. Titration index
b. Indicator constant
c. Neutralization point
d. Titration jump
e. Transition interval

500. A patient with mushroom poisoning has developed the following symptoms: yellow coloring of skin and sclera, dark-coloured urine. Hemolytic jaundice was diagnosed. What pigment causes such colouring of the patient's urine?

a. Stercobilin
b. Biliverdin
c. Verdohemoglobin
d. Conjugated bilirubin
e. Unconjugated bilirubin

501. What indicator is used in determination of primary aromatic amines using the nitritometric method?
a. Potassium chromate
b. Methyl orange
c. Eosin
d. Phenolphthalein
e. Tropeolin 00

502. What causes the dry cough that developed in a patient who has been taking lisinopril for a long time to treat her essential hypertension?
a. Depletion of the noradrenaline reserves
b. Accumulation of angiotensin II
c. Inhibition of angiotensin receptors
d. Decreased renin levels
e. Increased bradykinin levels

503. Calculation of thermal effects of chemical reactions at a pharmaceutical factory is based on the Hess law stating that reaction thermal effect is determined by:
a. Mechanism by which the chemical change occurs
b. Route by which the chemical change occurs
c. Process duration
d. Number of intermediate stages
e. Initial and final state of system

504. A patient with hyperproduction of thyroid hormones has been prescribed Merkazolilum. This drug inhibits the following enzyme of iodothyronine synthesis:
a. Reductase
b. Decarboxylase
c. Iodide peroxidase
d. Aromatase
e. Aminotransferase

505. A dispensing chemist performs identification of pharmaceutical substance using ultraviolet spectrophotometry. The specialist obtains the graph of optical density to wavelength ratio, which is called:
a. Titration curve
b. Logarithmic curve
c. Calibration curve
d. Light absorbtion curve
e. Emission spectrum

506. What anti-gout drug, based on its mechanism of action, is a urate-lowering agent and a xanthine oxidase inhibitor?
a. Urosulfan (Sulfacarbamide)
b. Allopurinol
c. Etamide
d. Urodan
e. Urolesane

507. A 2M solution of HCl was added into the studied solution, resulting in formation of a white precipitate that dissolved when heated. What cations are present in the solution?
a. Ba^2+
b. Pb^2+

c. Ag^+
d. Hg^22+
e. Mg^2+

508. Gypsum water is added to a test solution for analytical determination of barium ions. What visual effect is observed in this case?
a. A characteristic odor appearing
b. Formation of a white precipitate
c. Production of a brown gas
d. Yellow coloring of the solution
e. Formation of a blue precipitate

509. A food plant of Polygonaceae family is being studied. The plant has reddish stalk, cordate-sagittate leaves, its fruit is a trihedral nutlet. Name this plant:
a. Persicaria hydropiper
b. Fagopyrum esculentum
c. Rumex confertus
d. Persicaria bistorta
e. Polygonum aviculare

510. Any damage to the patient's vessels results in persistent hemorrhage. Blood clotting factor VIII is deficient in the patient's blood. What disease does this patient suffer from?
a. Hemophilia
b. Acute vascular purpura
c. Thrombocytopenic purpura
d. Anemia
e. Radiation sickness

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

512. In acidimetry, titrants are prepared using the method of determined titer. What substance is used for their standardization according to the State Pharmacopoeia of Ukraine?
a. Metallic iron
b. Metallic zinc
c. Sodium chloride
d. Potassium chloride
e. Sodium carbonate

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

514. A patient developed neuritis of the facial nerve after 5 months of anti-tuberculosis treatment. What drug has caused this side effect?
a. Benzylpenicillin sodium
b. Isoniazid
c. Ceftriaxone
d. Rifampicin
e. Sodium para-aminosalicylate

515. A woman complains of itching lips; they are reddened and covered in scabs and scales after she had been using new lipstick for two weeks. What allergic reactions result in this kind of disorders?
a. Delayed
b. Cytotoxic
c. Anaphylactic
d. Stimulating
e. Immune complex

516. A sterile form of Inonotus obliquus xylotrophic fungus was sampled from the trunk of Betula pendula. Its alternative names include ''birch fungus'' and:
a. Fly agaric
b. Chaga mushroom
c. Tinder fungus
d. Champignon
e. Ergot

517. Antidepressants can increase the content of catecholamines in the synaptic cleft. What is the mechanism of action of these drugs?
a. Inhibit xanthine oxidase
b. Activate aminotransferase
c. Activate decarboxylase
d. Inhibit monoamine oxidase
e. Inhibit aminotransferase

518. What characteristic is used to choose indicator for titration analysis?
a. Transition interval
b. Indicator constant
c. Titration curve jump
d. Equivalence point
e. Titration indicator

519. 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. Nitrofurans
b. Oxidants
c. Detergents
d. Dyes
e. Alcohols

520. Many drugs must be manufactured under strictly aseptic conditions. One such possible source of microbiological contamination of drugs is laboratory glassware. What method should be used to sterilize the glassware?
a. Dry heat
b. Ignition
c. Pasteurization
d. Boiling
e. Tyndallization

521. In gas-liquid chromatography the substances being analyzed are entered into the stream of a carrier gas. This gas must meet the following condition:
a. Affinity for the stationary phase
b. High molecular weight
c. High thermal conductivity
d. Inert to the stationary phase and the substances being analyzed
e. Rate of movement through the column

522. What cation can be detected with Chugaiev's agent (Dimethylglyoxime)?
a. K^+
b. Ni^2+

c. Mn^2+
d. Co^2+
e. Ca^2+

523. A 40-year-old man was prescribed antibiotics as a part of the complex therapy for peptic ulcer disease of the stomach. Which of the following combinations is indicated in this case?
a. Phenoxymethylpenicillin + lincomycin
b. Amoxicillin + clarithromycin
c. Levomycetin (chloramphenicol) + ampicillin
d. Streptomycin + benzylpenicillin
e. Oxacillin + nalidixic acid

524. Some leaf cells have lignified membranes. These cells are called:
a. Trichomes
b. Sieve tubes
c. Companion cells
d. Collenchyma
e. Sclereids

525. During skill building session in the field of microbiology, a student performed inoculation of microorganisms into the solid nutrient medium to obtain isolated colonies. How should inoculation loops be sterilized after that?
a. Heating in the burner flame
b. Soaking in 1% chloramine-B solution
c. Formaldehyde vapor sterilization
d. Dry heat sterilization under 160^oC for 120-150 minutes
e. Boiling under 60^oC five times

526. What substance can be used to prepare primary standard solutions of titrants?
a. KMnO_4
b. NaOH
c. I_2
d. HCl
e. K_2Cr_2O_7

527. What type of parenchyma usually has aleurone or starch grains and droplets of a fatty oil in its cells?
a. Folded parenchyma
b. Storage parenchyma
c. Spongy parenchyma
d. Water-storing parenchyma
e. Columnar parenchyma

528. A 23-year-old man came to the infectious diseases department with complaints of abdominal distension and diarrhea. He was diagnosed with lambliasis. What type of leukocytosis is characteristic of this disease?
a. Neutrophilic
b. Lymphocytic
c. Basophilic
d. Eosinophilic
e. Monocytic

529. A patient with epilepsy was prescribed sodium valproate. What is the mechanism of action of this drug?
a. Stimulation of beta-adrenergic receptors
b. Stimulation of butyrylcholinesterase activity
c. Increasing GABA levels in the brain
d. Stimulation of opioid receptors
e. Stimulation of alpha-adrenergic receptors

530. A standard alkali solution is used to determine substances of acidic nature. This method is called:
a. Gravimetry
b. Redoxymetry (Oxidimetry)
c. Acidimetry
d. Alkalimetry
e. Complexometry (Chelatometry)

531. Exudation is an effect of inflammation-caused disruption of blood circulation. In the course of inflammatory process it starts at the following stage of vascular disorder:
a. Prestasis
b. Arterial hyperemia
c. Stasis
d. Arterioles spasm
e. Venous hyperemia

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

533. What compound will react with propane under the given conditions?
a. Cl_2, FeCl_3
b. CH_3COONO_2
c. H_2SO_4 concentrated
d. HNO_3 concentrated
e. Br_2, hnu, 20^oC

534. In Ukraine all vaccinations are conducted according to the Ministry of Health decree ''On preventive immunization in Ukraine and control of quality and turnover of immunobiological medical products''. Which of the listed diseases is included in the national routine immunization schedule?
a. Botulism
b. Rickettsiosis
c. HIV infection
d. Poliomyelitis
e. Influenza

535. A patient with acute myocardial infarction received anticoagulation therapy. What compound will have anticoagulation effect?
a. Dermatan sulfate
b. Keratan sulfate
c. Heparin
d. Chondroitin sulfate
e. Hyaluronic acid

536. A patient, who lives in the area with specific geochemical conditions, was diagnosed with endemic goiter. What microelement deficiency results in development of this pathology?
a. Na
b. Br
c. Cl
d. F
e. I

537. A man has acute glomerulonephritis. Because of oliguria, water retention is observed in his body. What abnormality of the total blood volume is most likely to be detected in this patient?
a. Simple hypovolemia
b. Polycythemic hypervolemia

c. Oligocythemic normovolemia
d. Oligocythemic hypervolemia
e. Simple hypervolemia

538. Examination of an underground organ of Poligonatum odoratum shows that it is horizontally oriented, uniformly thick and has nodes, internodes, round indentations, and an apical bud. Therefore, it is a:
a. Main root
b. Rhizome
c. Root crop
d. Underground stolon
e. Root tuber

539. 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. Thyrotropin
c. Oxytocin
d. Somatotropin
e. Corticotropin

540. Microbiological purity of tableted drugs had been tested at factory. Samples cultivation in mannitol salt agar resulted in growth of golden-yellow colonies, microscopic examination of colonies detected gram-positive globular bacteria positioned in clusters; microorganisms had plasma coagulation prorerties. What pure bacterial culture was obtained?
a. Staphylococcus saprophyticus
b. Enterobacteriaceae
c. Staphylococcus aureus
d. Staphylococcus epidermidis
e. Pseudomonas aeruginosa

541. A patient has developed anuria. Blood pressure is 50/20 mm Hg. What process of uropoiesis was disturbed resulting in acute decrease of urine output?
a. Facultative reabsorption
b. Obligate reabsorption
c. Glomerular filtration
d. Tubular secretion
e. -

542. The presence of storage proteins in a microslide prepared from Phaseolus vulgaris endosperm can be confirmed, if the microslide colors golden-yellow when stained with Lugol solution. In plant seeds, such protein deposits are called:
a. Inulin
b. Starch grains
c. Glycogen
d. Chlorophyll grains
e. Aleurone grains

543. Tissue respiration is accompanied by formation of carbon dioxide and water. What component of the mitochondrial respiratory chain ensures the reduction of oxygen and formation of water?
a. ATP / ADP translocase
b. Cytochrome C
c. Acylcarnitine transferase
d. Cytochrome oxidase
e. Ubiquinone

544. Essential oils are used both in pharmaceutical and cosmetic industry. To extract essential oils from herbal raw material, the following technology is used:
a. Steam distillation

b. Calorimetry
c. Conductometry
d. Potentiometry
e. Colorimetry

545. Which one of the substances listed below is not a surfactant?
a. Sodium palmitate
b. 1-Pentanol
c. Sodium oleate
d. Sodium chloride
e. Sodium stearate

546. After eating early vegetables that had high nitrite levels, a child developed hemic hypoxia. It is caused by accumulation of the following substance:
a. Carboxyhemoglobin
b. Oxyhemoglobin
c. Deoxyhemoglobin
d. Methemoglobin
e. Carbhemoglobin

547. Solutions of some electrolytes are used as medicines. What is the maximum value of the isotonic coefficient for MgSO_4 solution?
a. 7
b. 2
c. 4
d. 5
e. 3

548. During feces analysis of a 3-month-old child with signs of enteric infection, numerous dark-red colonies have grown on Endo agar. What microorganisms can be the causative agents of this enteric infection?
a. Gonococci
b. Salmonellae
c. Escherichia
d. Shigella
e. Streptococci

549. A pharmacy has received a batch of drugs for treatment of upper respiratory tract infection. What drug is used to treat influenza?
a. Methisazone
b. Doxycycline
c. Idoxuridine
d. Levamisole
e. Rimantadine

550. When studying a herbarium specimen of Persicaria maculosa, the following diagnostic sign, characteristic of all Polygonaceae family representatives, was noted:
a. Compound leaves
b. Essential oil glands
c. Ochrea
d. Legume fruits
e. No petioles

551. What vitamin supplement is typically prescribed along with folic acid in cases of hyperchromic anemia?
a. Cyanocobalamin
b. Retinol
c. Pyridoxine
d. Fercoven

e. Thiamine

552. What types of fruits are characteristic of the Ericaceae family plants?
a. Hesperidium, silique, double-winged samara
b. Legume, single follicle, single nutlet
c. Cynarrhodium, compound drupe, fraga
d. Achene, nutlet, drupe
e. Capsule, drupe, berry

553. What method is used for the quantification of magnesium sulfate solution for injections?
a. Complexonometry
b. Cerimetry
c. Acid-base titration
d. Nitritometry
e. Iodine monochloride titration

554. A 52-year-old man complains of sour eructation, heartburn, nausea, epigastric pain, and constipations. What gastric secretion disorder is likely in the patient?
a. Achlorhydria
b. Hypersecretion and hyperchlorhydria
c. Hyposecretion
d. Hypochlorhydria
e. Achylia

555. Azo dyes are produced as the result of:
a. Nitration
b. Amination
c. Azo coupling
d. Nitrosation
e. Diazotization

556. What drug has an anxiolytic and anticonvulsant effect?
a. Diazepam
b. Reserpine
c. Aminazine (Chlorpromazine)
d. Droperidol
e. Phenobarbital

557. A certain infection leads to fetus malformation if a pregnant woman is affected. What vaccine should be used for prevention of this infection?
a. Antirabic vaccine
b. Influenza virus vaccine
c. Poliovirus vaccine
d. Mumps vaccine
e. Rubella virus vaccine

558. A solution contains anions of organic acids. When a solution of iron(III) chloride was added, a pink-yellow precipitate formed. What anions are present in the solution?
a. Oxalate anions
b. Benzoate anions
c. Formate anions
d. Carbonate anions
e. Tetraborate anions

559. What reference electrode can be used in potentiometric analysis of a medicinal substance?
a. Antimony
b. Silver chloride
c. Quinhydrone
d. Glass

e. Zinc

560. "Collargol" pharmaceutical preparation is a colloidal solution of silver that contains a high-molecular compound. What is the function of this compound?
a. Induces coagulation
b. Decreases aggregate stability
c. Facilitates sedimentation
d. Increases aggregate stability
e. Increases degree of dispersion

561. A 10-year-old child has height of 178 cm and body mass of 67 kg. These presentations are caused by the functional disturbance of the:
a. Adrenal glands
b. Gonads
c. Pituitary gland
d. Parathyroid glands
e. Thyroid gland

562. What anion of the 2nd analytic group produces black precipitate with group reagent AgNO_3?
a. I^-
b. Cl^-
c. NCS^-
d. Br^-
e. S^2-

563. What is represented by such a pharmacokinetic value of a drug as its biological half-life (T1/2)?
a. Time period in which plasma drug concentration decreases by 50%
b. Correlation between the drug clearance rate and plasma drug concentration
c. Period of total body clearance
d. Renal clearance rate
e. Blood plasma volume cleared of drug within a time unit

564. A woman underwent gastric resection and 5 years later was diagnosed with B_12-deficiency anemia. What blood cells are typically present in this type of anemia?
a. Megalocytes
b. Microcytes
c. Echinocytes
d. Reticulocytes
e. Annulocytes

565. A pure culture of movable vibrios was obtained from a patient diagnosed with cholera. What group of flagellates does this agent belong to?
a. Monotrichous
b. Amphitrichous
c. Lophotrichous
d. -
e. Peritrichous

566. During absolute starvation, the body uses endogenous water. What substance is the source of endogenous water in the human body?
a. Fats
b. Glycogen
c. Proteoglycans
d. Cellulose
e. Proteins

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

b. Aminocaproic acid
c. Etamsylate
d. Ascorbic acid
e. Fibrinogen

568. Proserin is a reverse acetylcholinesterase inhibitor. What is the mechanism of inhibitory action of the drug?
a. Covalent bond with enzyme substrate
b. Oxidation of iron ion in enzyme active center
c. Competition with acetylcholine for enzyme active center
d. Enzyme denaturation
e. Covalent bond outside of enzyme active center

569. Plantago major inflorescence grows at the apex, its rachis is long, with sessile flowers. Name this type of inflorescence:
a. Panicle
b. Capitulum
c. Spike
d. Thyrse
e. Spadix

570. What hormone changes glucose levels in the blood and is produced in the pancreas?
a. Insulin
b. Aldosterone
c. Growth hormone
d. Testosterone
e. Somatostatin

571. Against the background of treatment with antihypertensive drugs, a woman developed a dry cough. What drugs have caused this side effect?
a. Calcium channel blockers
b. Ganglioblockers
c. ACE inhibitors
d. alpha-blockers
e. Diuretics

572. Silver nitrate solution was added into a solution with anions of the first analytical group. A yellow precipitate was produced as the result, which indicates that this solution contained:
a. Bromide ions
b. Iodide ions
c. Sulfate ions
d. Arsenite ions
e. Arsenate ions

573. Many species of wild rose are a source of vitamins, fatty oils, and herbal material. Specify the juicy pseudocarps that are harvested as herbal raw material:
a. Aggregate-accessory fruits
b. Coenobia
c. Cenocarp stone-fruits
d. Hesperides
e. Rose hips

574. What solution can be used to detrmine the presence of chloride ions in the potable water?
a. Silver nitrate
b. Potassium bromate
c. Sodium hydroxide
d. Iodine
e. Ammonia

575. For diagnostics of meningitis, smears of the cerebrospinal fluid sediment, stained using the Gram technique are being studied. What finding can confirm the diagnosis of meningococcal infection?
a. Lancet-shaped Gram-positive diplococci
b. Gram-negative cocci bacteria located within leukocytes
c. Gram-positive diplococci located within leukocytes
d. Gram-negative diplococci located within leukocytes and outside of them
e. Diplococci surrounded by a capsule

576. Which one of the listed drugs can be used to treat candidiasis?
a. Nystatin
b. Azithromycin
c. Ceftriaxone
d. Clindamycin
e. Doxycycline

577. Select ketose from the monosaccharides listed below:
a. Mannose
b. Arabinose
c. Fructose
d. Glucose
e. Ribose

578. A patient has been hospitalized into the infectious diseases department of a regional hospital with the provisional diagnosis of typhoid fever. What serological reaction must be carried out to confirm the diagnosis?
a. Wright reaction
b. Widal test
c. Wassermann reaction
d. Huddleson reaction
e. Elek test

579. Name the psychostimulant with analeptical action, which is a purine derivative:
a. Sulpiride
b. Sodium bromide
c. Medazepam
d. Tramadol
e. Caffeine and sodium benzoate

580. A 45-year-old man suffers from antacid gastritis. In this case, disturbed production of the following substance can be observed in the patient's stomach:
a. Intrinsic antianemic factor
b. Gastricsin
c. Mucus
d. Hydrochloric acid
e. Pepsin

581. Throughout the last year, a 2-year-old child had frequent infectious diseases of a bacterial genesis with a protracted course. Study of the patient's immunogram detected hypogammaglobulinemia. What cells are most likey to be dysfunctional in this case, causing these clinical presentation and laboratory findings?
a. Phagocytes
b. Macrophages
c. NK cells
d. B lymphocytes
e. Killer T cells

582. Mantoux skin test is used to screen school children for infection with Mycobacterium tuberculosis. What testing agent is necessary for this procedure?
a. BCG vaccine

b. Anti-anthrax vaccine (STI)
c. Anthraxinum
d. Brucellin
e. Tuberculin

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

584. Drafting of analytical normative documents requires skills in macro- and microscopical analysis of plant organs. If a microslide mount shows clearly visible multilayered palisade (columnar) parenchyma, it is characteristic of:
a. Adventitious roots
b. Fern rhizomes
c. Stems of dicotyledons
d. Roots
e. Leaves

585. Select from the list an adsorption indicator:
a. Methyl-orange
b. Eriochrome black T
c. Sulfosalicylic acid
d. Eosin
e. Phenolphthalein

586. What diuretic reduces excretion of uric acid?
a. Mannitol
b. Acetazolamide
c. Hydrochlorothiazide
d. Verospiron (Spironolactone)
e. Furosemide

587. Bacteriological analysis was conducted to assess the quality of the water used for pharmaceutical purposes. What value indicates the number of coliform bacteria in 1 liter of water?
a. Enterococcus titer
b. Perfringens titer
c. Coliphage titer
d. Coli index
e. Microbial number

588. A man was brought into the admission room with complaints of problematic breathing, salivation, spastic abdominal pain, diarrhea, dizziness, and deteriorating visual acuity. He was diagnosed with a poisoning caused by organophosphorus compounds. What medicines should be included into the pathogenetic therapy in this case?
a. Glucose and bemegride
b. Atropine sulfate and dipyroxime (trimedoxime bromide)
c. Sodium thiosulfate and bemegride
d. Nalorphine hydrochloride and bemegride
e. Tetacin-calcium (sodium calcium edetate) and unithiol (dimercaptopropansulfonate)

589. After the pus sample taken from the urethra had been inoculated on ascitic agar, it resulted in growth of round transparent colonies. Microscopy of the colonies shows gram-negative kidney bean-shaped diplococci. What causative agent is it?
a. Meningococcus

b. Streptococcus
c. Micrococcus
d. Gonococcus
e. Pneumococcus

590. A doctor has prescribed a nonsteroidal anti-inflammatory drug to relieve inflammation and pain syndrome. Name this drug:
a. Loratadine
b. Calcium chloride
c. Glibenclamide
d. Diclofenac sodium
e. Prednisolone

591. A certain perennial alkaloid-containing plant is widely used in medicine. It has the following features: pinnately dissected leaves with light green upper surface and bluish lower surface; regular bisexual flowers with double perianth, attached to long peduncles, located in the axils of narrow sharp bracts, and clustered together in umbel inflorescences; the fruit is a siliquiform capsule; the plant produces an orange milky sap. These biological features are characteristic of:
a. Papaver somniferum
b. Atropa belladonna
c. Vinca minor
d. Datura stramonium
e. Chelidonium majus

592. The antitumor agent 5-fluorouracil blocks the enzyme that attaches the methyl group to deoxyuridine monophosphate (dUMP). What reaction becomes inhibited, when this medicine is used?
a. Synthesis of glucose monophosphate
b. Synthesis of thymidine monophosphate
c. Synthesis of adenosine monophosphate
d. Synthesis of guanosine monophosphate
e. Synthesis of glycerol monophosphate

593. Mass fraction of pharmaceutical preparations that contain aromatic amino groups is defined through nitrite titration. What external indicator is used in this case?
a. Eosin
b. Phenolphthalein
c. Methylene red
d. Starch-iodide paper
e. Eriochrome Black T

594. When food products are thermally processed, the spatial structure of the proteins changes. This process is called:
a. Dialysis
b. Renaturation
c. Denaturation
d. Salting out
e. Hydration

595. Insulin production in beta-cells involves many substances. What substance gives the main signal for insulin synthesis when its concentration changes?
a. Hemoglobin
b. Urea
c. Heparin
d. Glucose
e. Carbon dioxide

596. Chromatographic methods can be classified by the mechanism of the separation process. What type of chromatography includes the gas-liquid chromatographic method?
a. Distribution chromatography

b. Ion exchange chromatography
c. Gel chromatography
d. Affinity chromatography
e. Adsorption chromatography

597. What forms when gelatin dissolves in water at an elevated temperature?
a. Elastic xerogel
b. Suspension
c. Brittle xerogel
d. Molecular solution
e. Emulsion

598. What type of proenzyme activation into its active enzyme form is often used in the process of activation of hydrolases in the gastrointestinal tract?
a. Limited proteolysis
b. Transamination
c. Decarboxylation
d. Phosphorylation
e. Addition of a metal cation

599. Colloidal systems are widely used in medicine. In pastes:
a. Dispersed medium - liquid, continuous medium - gas
b. Dispersed medium - solid, continuous medium - gas
c. Dispersed medium - solid, continuous medium - solid
d. Dispersed medium - liquid, continuous medium - liquid
e. Dispersed medium - solid, continuous medium - liquid

600. To obtain water-soluble iodine preparations (iodoforms), iodine is dissolved in surfactants that form micelles. The process, when compounds that are insoluble in a certain solvent, spontaneously dissolve in the micellar systems, is called:
a. Adsorption
b. Solubilization
c. Neutralization
d. Sedimentation
e. Coagulation

601. Oxytocin was prescribed for a pregnant woman with weak labor activity, who was hospitalized into the maternity ward. What pharmacological group does this drug belong to?
a. Pituitary hormone preparations
b. Mineralocorticoids
c. Glucocorticoids
d. Anabolic steroids
e. Thyroid hormone preparations

602. A miner, who was trapped under a rock pile, developed crush syndrome and signs of hepatic coma. Hyperammonemia was detected in his blood. What process has caused the increase in the ammonia levels in the patient's blood?
a. Glycolysis
b. Hydroxylation of amino acids
c. Deamination of amino acids
d. Bilirubin catabolism
e. Gluconeogenesis

603. Chloromethane is used in medicine as a local anesthetic. In the manufacturing of certain medicines, it is an intermediate product of the technological chain. What compound is formed as a result of alkaline hydrolysis of chloromethane according to the scheme given below?
CH_3-Cl+NaOHxrightarrow H_2O ?
a. Methanol
b. Ethane

c. Sodium formate
d. Methane
e. Methanal

604. In the process of conductometric titration of HCl and CH_3COOH acids mixture 0,1 M solution of NaOH is used to measure:
a. Electrical conduction in solution
b. pH of medium
c. Rotation angle of polarized light plane
d. Potential difference
e. Refractive index

605. An HIV-infected patient presents with suppression of the immune system activity. What cells are affected in this case, causing the state of immunodeficiency in the patient?
a. Suppressor T cells
b. Macrophages
c. B lymphocytes
d. Killer T cells
e. Helper T cells

606. A pharmacy needs to sterilize a liquid dosage form by means of a mechanical sterilization method. What device should be used for this purpose?
a. Autoclave
b. Pasteur oven
c. Steam sterilizer
d. Seitz filter
e. Koch apparatus

607. The isoelectric point of a protein is 5.7. At what pH value does the protein macroion move to the anode?
a. 5.7
b. 4.7
c. 4.0
d. 7.0
e. 5.0

608. What indicator should be chosen for standardization of a hydrochloric acid solution using Na_2CO_3 and Na_2B_4O_7 solutions?
a. Methyl red
b. Murexide
c. Thymol blue
d. Eosin
e. Tropeolin 00

609. A patient with peptic ulcer disease of the duodenum was taking a histamine H_2 receptor blocker. Which one of the listed drugs belongs to this group?
a. Famotidine
b. Omeprazole
c. Allochol
d. Mebeverine
e. Pirenzepine

610. What anions interfere with the determination of halide ions by means of the Volhard method, because they form a strong colorless complex with iron(III) ions?
a. MnO_4^-
b. NO_3^-
c. F^-
d. NO_2^-
e. SO_3^2-

611. A mother with a 6-year-old child came to a local pediatrician. She complains that her child has sore throat and problems with breathing. The doctor suspects laryngeal diphtheria. What external breathing disorder can develop with such localization of the disease?
a. Slow, deep, with labored expiration
b. Slow, deep, with labored inspiration
c. Cheyne-Stokes respiration
d. Rapid, shallow
e. Biot respiration

612. Symptoms of cardiac failure are detected during examination of a female patient. Specify the possible cause of myocardial failure among those named below:
a. Coarctation of aorta
b. Mitral stenosis
c. Primary hypertension
d. Pulmonary emphysema
e. Infectious myocarditis

613. A patient came to the pharmacy to obtain an antidiarrheal agent. What drug would be recommended by the dispensing chemist?
a. Dicaine (Tetracaine)
b. Ranitidine
c. Loperamide
d. Picolax (Sodium picosulfate)
e. Anesthesin (Benzocaine)

614. An engine driver complains of his seasonal allergy symptoms. What non-sedating drug should be prescribed in this case?
a. Atenolol
b. Analgine (Metamizole)
c. Loratadine
d. Fenofibrate
e. Novocaine

615. During a practical skill-building session, in the Konheim experiment, a student observes the dynamics of vascular reactions and changes in the blood circulation in an inflammatory focus. Name the correct sequence of the stages, characteristic of acute inflammation development:
a. Arterial hyperemia, venous hyperemia, prestasis, stasis, spasm of arterioles
b. Venous hyperemia, arterial hyperemia, prestasis, stasis, spasm of arterioles
c. Venous hyperemia, stasis, spasm of arterioles, arterial hyperemia, prestasis
d. Prestasis, stasis, spasm of arterioles, arterial hyperemia, venous hyperemia
e. Spasm of arterioles, arterial hyperemia, venous hyperemia, prestasis, stasis

616. Trimerization of acetylene results in the following product:
a. Trimethylbenzene
b. Benzene (benzol)
c. Cyclooctatetraene
d. Vinylacetylene
e. 2-Butyne

617. To identify iodide ions in a solution, a reaction with lead cations was conducted. The obtained precipitate was dissolved in water by means of heating; afterwards the test glass was cooled. What analytical effect could be observed in the process?
a. Blue precipitate
b. Brown precipitate
c. Golden scales
d. White precipitate
e. Gas bubbles

618. Surfactants and high-molecular compounds are added into concentrated emulsions to stabilize

them. These substances are:
a. Catalysts
b. Emulsifiers
c. Absorbents
d. Solvents
e. Activators

619. Specify what method of redox titration requires the use of specific indicator - starch - to fix the end point:
a. Cerimetry
b. Nitritometry
c. Bromatometry
d. Iodometry
e. Permanganatometry

620. Coulometry is based on measuring the amount of electricity needed for an electrode reaction. What law is the basis for coulometric determination of substances?
a. Coulomb law
b. Beer-Bouguer-Lambert law
c. Faraday law
d. Newton law
e. Stokes law

621. Select a metallochromic indicator from the list below.
a. Eosin
b. Murexide
c. Litmus
d. Starch
e. Methyl orange

622. In medicine, various dosage forms are used: emulsions, foams, powders, etc. that can be classified as disperse systems. What determines the dispersion in such systems?
a. The degree of the dispersed material comminution
b. The volume of the continuous medium
c. The mass of the comminuted substance
d. The nature of the dispersed material
e. The shape of the particles

623. Pharmacological action of enterosgel (methylsilicic acid hydrogel, polymethylsiloxane polyhydrate) is based on a certain phenomenon characteristic of disperse systems. Name this phenomenon:
a. Cohesion
b. Adhesion
c. Adsorption
d. Wettability
e. Desorption

624. A patient presents with temperature 38.5-39.5^oC, nausea, vomiting, and stomachache. Poisoning with salts of heavy metals is diagnosed. What drug should be prescribed as an antidote in this case?
a. Unithiol
b. Validol (Menthyl isovalerate)
c. Phenolphthalein
d. Pentazocine
e. Bromhexine

625. The pharmacological effect of some antidepressants is associated with detoxification of biogenic amines in the brain. What enzyme inactivates biogenic amines?
a. Monoamine oxidase

b. Deaminase
c. Transaminase
d. Decarboxylase
e. Lactate dehydrogenase

626. Coagulation of sols under the effect of electrolytes can be determined by a general rule. Name this rule.
a. Arrhenius law
b. Schulze-Hardy rule
c. Duclos-Traube rule
d. Van't Hoff rule
e. Gibbs rule

627. A fruit consists of overgrown conic red pulpy hypanthium and proper carpels - small nuciform achenes recessed in the fruit pulp. This type of fruit belongs to:
a. Rubus idaeus
b. Aronia melanocarpa
c. Pyrus communis
d. Rosa canina
e. Fragaria vesca

628. Ultraviolet irradiation is used in medicine in various physiotherapeutic procedures. What mechanism of medicinal action is characteristic of ultraviolet rays?
a. Decrease of melanin synthesis in the skin
b. Activation of vitamin D synthesis
c. Activation of lipid peroxidation
d. Intensification of cell division
e. Activation of drug action

629. Ammonium ions (NH_4^+) must be removed from a mixture during the detection of sodium (Na^+) and potassium (K^+) cations of the first analytical group. Why is it necessary?
a. Ammonium salts decompose at high temperatures
b. Compounds with K^+ and Na^+ ions form supersaturated solutions
c. They interfere with the determination of potassium and sodium ions
d. The solution pH becomes <7, because of hydrolysis of these ions
e. The solution pH becomes >7, because of hydrolysis of these ions

630. A pharmacy has decided to use a biological method for quality control of instrument sterilization in an autoclave. What microorganisms optimally should be used for this purpose?
a. Streptococcus pyogenes
b. Bacillus subtilis
c. Salmonella typhi
d. Borrelia recurrentis
e. Yersinia pestis

631. A patient with peptic ulcer of duodenum was taking a histamine H_2-receptor antagonist. What drug of those given below belongs to this group?
a. Gastrozepin (Pirenzepine)
b. Almagel (algeldrate + magnesium hydroxide)
c. Famotidine
d. Omeprazole
e. Allochol

632. What bacteria indicate the presence of fecal contamination?
a. Anthracoids
b. Serratia
c. Sarcina
d. Escherichia coli
e. Klebsiella

633. To determine qualitative content of a drug, the drug sample was processed with 2M solution of HCl. White precipitate soluble in aqueous ammonia solution was formed. This analytical effect indicates the presence of the following cations:
a. Lead(II)
b. Mercury(II)
c. Silver(I)
d. Tin(II)
e. Mercury(I)

634. A person diagnosed with ischemic heart disease presents with stable angina pectoris, atherosclerosis, and elevated plasma lipids. What class of lipids plays the main role in the pathogenesis of atherosclerosis?
a. Fatty acid-albumin complexes
b. Low density lipoproteins
c. Triglycerides
d. Chylomicrons
e. High density lipoproteins

635. What inflammatory mediator contributes to an increase in body temperature?
a. Serotonin
b. Interleukin-1
c. Bradykinin
d. Histamine
e. Thromboxane

636. What drug is advisable for individual malaria prophylaxis?
a. Ampicillin
b. Rifampicin
c. Trimethoprim/sulfamethoxazole (Co-trimoxazole)
d. Gentamicin
e. Chingamin

637. What particles of the micelle described by the following formula: m(AgCl) nAg^+ (n-x) NO_3^-^x+ xNO_3^- are situated in diffusion layer?
a. AgCl and Ag^+
b. AgCl
c. Ag^+ and NO_3^-
d. NO_3^-
e. Ag^+

638. A patient diagnosed with viral hepatitis developed ascites, jaundice, itching, leg edemas, and dyspnea. What type of jaundice is observed in the patient?
a. Obstructive
b. Parenchymatous
c. Mechanical
d. Hemolytic
e. Suprahepatic

639. The pharmacopoeial method of determining the purity of antibiotics, vitamins, etc. requires studying the movement of the dispersed phase particles in a stationary dispersion medium under the effect of a difference in potentials. Name this phenomenon.
a. Electroosmosis
b. Sedimentation potential
c. Brownian motion
d. Streaming potential
e. Electrophoresis

640. What is the most common side-effect of inhaled corticosteroids?
a. Subcapsular cataract

b. Arterial hypertension
c. Oropharyngeal candidiasis
d. Osteoporosis
e. Increased body mass

641. A modern drug that inhibits the HMG-CoA reductase enzyme and reduces cholesterol synthesis was received by a pharmacy chain. Name this drug.
a. Atorvastatin
b. Lisinopril
c. Enalapril
d. Furosemide
e. Hydrochlorothiazide

642. What specific reagent is used in the qualitative analysis for Fe^2+ cations?
a. K_3[Fe(CN)_6]
b. NH_4OH
c. K_4[Fe(CN)_6]
d. NaOH
e. K_2Na[Co(NO_2)_6]

643. What types of inflorescence are characteristic of the Cruciferae family?
a. Tassel or panicle
b. Corymb or spike
c. Head or umbel
d. Head or corymb
e. Spadix or panicle

644. The secondary structure of eukaryotic DNA is a double helix. What bonds keep the strands of DNA molecule together?
a. Hydrogen
b. Ester
c. Disulfide
d. Glycosidic
e. Peptide

645. The Fajans-Khodakov method is used to determine the mass fraction of sodium chloride (NaCl) in a drug. What indicator is used in this titration method?
a. Methyl red
b. Fluorescein
c. Potassium chromate
d. Ammonium iron(III) sulfate
e. Phenolphthalein

646. The patient with parkinsonism has been prescribed a drug - dopamine precursor - to relieve muscular rigidity. Name this drug:
a. Aminazine
b. Scopolamine hydrobromide
c. Atropine sulphate
d. Paracetamol
e. Levodopa

647. Optical activity of monosaccharides can be explained by their:
a. Asymmetric carbon atoms in a molecule
b. Aldehyde or ketone group
c. Complicated rotation around sigma-bond
d. Asymmetric crystal
e. Number of hydroxyl groups in a molecule

648. When do order and molecularity of chemical reactions coincide?

a. In enzymatic reactions
b. In complex multi-stage reactions only
c. In simple one-stage reactions only
d. Always coincide
e. Never coincide

649. Microscopy of subterranean organs of an Asteraceae family plant shows articulated laticifers with anastomoses filled with white latex. It is characterisic of the following plant:
a. Achillea millefolium
b. Artemisia absinthium
c. Taraxacum officinale
d. Helianthus annuus
e. Bidens tripartita

650. What should be used as an indicator electrode in potentiometric titration aimed at quantifying iron(II) sulfate?
a. Quinhydrone
b. Platinum
c. Antimony
d. Silver chloride
e. Glass

651. A 62-year-old woman with transmural myocardial infarction has developed heart failure. What is the pathogenetic mechanism of heart failure development in this case?
a. Volume overload of the heart
b. Pressure overload of the heart
c. Acute cardiac tamponade
d. Decreased mass of functioning cardiomyocytes
e. Myocardial reperfusion injury

652. The enzymes of medicinal substance metabolism that require monooxygenase reactions of biotransformation are localized in the cells mainly in the:
a. Mitochondria
b. Microsomes of the endoplasmic reticulum
c. Cytosol
d. Nucleus
e. Lysosomes

653. In a plant being studied, epidermis of some of the leaves has a thick cuticle and a layer of wax on the surface, while epidermis of the other leaves has scales or numerous trichomes and only a few stomata. What group does this plant belong to?
a. Xerophytes
b. Ephemerals
c. Hygrophytes
d. Mesophytes
e. Hydrophytes

654. What sanitary-indicative microorganisms are used for the assessment of the microbial contamination levels of potable water?
a. Escherichia coli
b. Clostridium perfringens
c. Streptococcus viridans
d. Candida albicans
e. Staphylococcus aureus

655. A patient presents with intestinal obstruction and a decrease in the bactericidal effect of gastric juice, which contributes to the growth of putrefactive microflora. In this case, increased excretion of a certain substance can be observed in urine. Name this substance.
a. Glucose

b. Indican
c. Creatine
d. Protein
e. Lactic acid

656. A 71-year-old woman with cholecystitis developed a yellow tint to her skin and mucosa. She was diagnosed with mechanical jaundice. The change in the patient's skin coloring occurred due to elevated levels of the following substance in her blood:
a. Urobilinogen
b. Unconjugated bilirubin
c. Stercobilinogen
d. Conjugated bilirubin
e. Bile acids

657. What substances given below are not surfactants?
a. Alcohols and soaps
b. Amines and sulfonic acids
c. Inorganic acids, bases, and their salts
d. Aldehydes and alcohols
e. Carboxylic acids and soaps

658. The process of glycolysis starts with irreversible reaction of glucose transforming into glucose 6-phosphate. What enzyme catalyzes this reaction?
a. Creatine kinase
b. Lipase
c. Catalase
d. Aldolase
e. Hexokinase

659. What titrant is used in bromatometric titration?
a. KBr
b. Br_2
c. KBrO_4 + KCl
d. KBrO_4
e. KBrO_3

660. A doctor has prescribed the patient a dopamine precursor for treatment of Parkinson's disease. After administration of this drug, the patient's mobility and mental processes improved and the ability to concentrate was restored. The maximum effect was observed after a month of treatment. Name this drug:
a. Midantan (Amantadine)
b. Selegiline
c. Cyclodol (Trihexyphenidyl)
d. Bromocriptine
e. Levodopa

661. Aerosols are one of the dosage forms. Name the phenomenon when aerosol particles move in the direction of decreasing temperature.
a. Electrophoresis
b. Peptization
c. Photophoresis
d. Sedimentation
e. Thermophoresis

662. Dietary fiber is a component of plant foods that plays an important role in prevention of gastrointestinal diseases. What polysaccharide is a primary component of plant cell walls?
a. Chitin
b. Starch
c. Glycogen

d. Chondroitin sulfate
e. Cellulose

663. "Protargol" and "collargol" colloidal silver preparations contain protein compounds besides their active substance. What is the function of proteins in these drugs?
a. Prevention of coagulation of the colloidal solution
b. Increased shelf life
c. Improved drug technology
d. Increased bactericidal effect of silver
e. Decreased side effects

664. Megaloblasts and a high color index were detected in the child's blood. The child was diagnosed with megaloblastic anemia. What drug must be prescribed in this case?
a. Ascorbic acid
b. Iron lactate
c. Nicotinic acid
d. Coamidum
e. Cyanocobalamin

665. What is the taxonomic division of a plant with periphloematic fibrovascular bundles that were detected during the study of the anatomical structure of its rhizome?
a. Green algae
b. Angiosperms
c. Polypodiophyta
d. Bryobionta
e. Gymnosperms

666. A woman came to a pediatrician complaining of deteriorating condition of her child. The disorder manifests in enlarged fontanelle, a delay in tooth eruption, and bone deformation. What medicine must be prescribed first in this case?
a. Proserin (Neostigmine)
b. Thiamine bromide
c. Cholecalciferol
d. Allopurinol
e. Cyanocobalamin

667. Potassium dichromate solution is to be analyzed. What physicochemical method of analysis will be used to determine its concentration?
a. Spectrophotometry
b. Coulometry
c. Fluorimetry
d. Conductometric titration
e. Polarimetry

668. Indicator microorganisms are being analyzed in the process of sanitary microbiological assessment of the environment, food, water, and commodities. Quantitative indicators of pollution are being measured, as well as the presence of certain microbial species. What value characterizes total microbial contamination in 1 gram of a solid substance or in 1 milliliter of a liquid?
a. Coli titer
b. Microbial count
c. Perfringens index
d. Perfringens titer
e. Coli index

669. What drug is prescribed for prevention of myocardial infarction, if there are contraindications to acetylsalicylic acid?
a. Ticlopidine
b. Heparin
c. Phenylin (Phenindione)

d. Streptokinase
e. Neodicoumarin (ethyl biscoumacetate)

670. What non-steroidal anti-inflammatory drugs selectively block COX-2?
a. Ortophen, Voltaren
b. Ibuprofen, Ketoprofen
c. Mefenamic acid, Naproxen
d. Meloxicam, Nimesulide
e. Indomethacin, Diclofenac sodium

671. Nitrate anions, unlike nitrite anions, do not interact with:
a. Iron(II) sulfate and sulfuric acid
b. Diphenylamine
c. Potassium permanganate
d. Antipyrine
e. Sulfanilic acid

672. In the process of breathing oxygen joins with hemoglobin in lungs and makes up oxyhemoglobin as a result, which leads to release of protons from hemoglobin and production of carbonic acid. What enzyme catalyzes further transformation of carbonic acid into carbon dioxide that is exhaled from lungs?
a. Carbonic anhydrase
b. Pyruvate kinase
c. Lipase
d. Heme oxygenase (haem oxygenase)
e. Catalase

673. Microscopy of the patient's vaginal smear detected trichomonads. What antimicrobial drug must be prescribed for treatment in this case?
a. Fluconazole
b. Biseptol (Co-trimoxazole)
c. Clotrimazole
d. Ethambutol
e. Metronidazole

674. A woman complains of elevated body temperature, weight loss, irritability, palpitations, and exophthalmos. Such changes are characteristic of the following endocrinopathy:
a. Hypoaldosteronism
b. Hypercorticism
c. Hyperaldosteronism
d. Hyperthyroidism
e. Hypothyroidism

675. A patient with allergic dermatitis came to the hospital. What anti-inflammatory and anti-allergic drug must be prescribed in this case?
a. Retabolil (Nandrolone)
b. Ethamide
c. Prednisolone
d. Oxytocin
e. Insulin

676. A solution of an alkali was added into the analyte solution and the resulting solution was heated. In the process, a black precipitate formed and a pungent-smelling gas was released. It indicates the presence of the following in the solution:
a. Ammonium and calcium ions
b. Ammonium and mercury(I) ions
c. Ammonium and lead(II) ions
d. Ammonium and mercury(II) ions
e. Ammonium and stanium(II) ions

677. A patient with frequent recurrent chronic bronchitis is prescribed a sulfanilamide drug. This drug is an analog of the following compound:
a. Citric acid
b. P-aminobenzoic acid
c. Formic acid
d. Lactic acid
e. Uric acid

678. How according to the Pharmacopoeia is pH determined?
a. Potentiometry
b. Polarography
c. Conductometry
d. Spectrophotometry
e. Indicator

679. A pharmacy produces eye drops and dispenses them into sterile vials. What method should be used to sterilize the vials?
a. Autoclaving
b. Dry heat box
c. Boiling
d. Ultraviolet irradiation
e. Disinfectant solutions

680. What drug should be prescribed to inhibit the synthesis of thyroid hormones?
a. Parathyroidin
b. L-thyroxine
c. Mercazolil (Thiamazole)
d. Thyroidin
e. Antistrumin (potassium iodide)

681. Complexonometry is a titrimetric method of analysis based on the interaction of polydentate ligand complexes with cations of alkaline earth and heavy metals, which results in formation of strong, easily water-soluble compounds. Solution of what substance is used in complexonometry as a titrant?
a. Silver(I) nitrate
b. Trilon B (ethylenediaminetetraacetic acid tetrasodium salt)
c. Potassium dichromate
d. Sodium thiosulfate
e. Sulfuric acid

682. A patient with signs of cardiac glycosides intoxication was prescribed Unithiol. What is the mechanism of drug action in this case?
a. Increased Na^+ content in the myocardium
b. Induction of cardiac glycoside metabolism
c. Binding of ionized Ca^2+
d. Increased inflow of K^+ to cardiomyocytes
e. Reactivation of membrane K^+, Na^+ -adenosine triphosphatase

683. A patient with myxedema was recommended substitution therapy. What hormones are used for this purpose?
a. Mineralocorticoids
b. Estrogens
c. Thyroid hormones
d. Glucocorticoids
e. Androgens

684. A patient with essential hypertension has been prescribed a drug with an antianginal, hypotensive, and antiarrhythmic effect. Name this drug.
a. Metoprolol

b. Clonidine
c. Fenoterol
d. Epinephrine
e. Dopamine hydrochloride

685. Potentiometric methods of analysis are based on the use of:
a. Dependence of the electric current on the concentration of the analyte
b. Dependence of the volume of the titrant on the concentration of the analyte
c. Dependence of the mass of the precipitate on the concentration of the analyte
d. Dependence of the volume of the produced gas on the concentration of the analyte
e. Dependence of the electromotive force (EMF) of a galvanic cell on the concentration of the analyte

686. In pharmacy, extraction is used to extract bioactive substances from herbal raw materials. What law underlies this process?
a. Distribution law
b. Law of mass action
c. Konovalov's law
d. Ostwald's law
e. Poiseulle's law

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

688. The breakdown of hemoglobin is accompanied by the formation of bile pigments. What pigment forms as a result of the heme oxidation reaction?
a. Chlorophyll
b. Urobilinogen
c. Biliverdin
d. Carotene
e. Stercobilinogen

689. If the amount of high-molecular substance added to the given sol is extremely small, it is possible its stability will decrease, instead of increase. What is this phenomenon called?
a. Syneresis
b. Synergism
c. Sedimentation
d. Sensitization
e. Solubilization

690. A 56-year-old man with ischemic heart disease was prescribed metoprolol. What is the mechanism of action of beta-blockers in ischemic heart disease?
a. Dilation of the coronary vessels
b. Increase of the myocardial oxygen demand
c. Reduction of the peripheral vessel tone
d. Reduction of the myocardial oxygen demand
e. Constriction of the coronary vessels

691. Hyperlipemia is observed in a patient 2-3 hours after eating greasy food. 9 hours later lipid ratio becomes normal again. How can this condition be characterised?
a. Hyperplastic obesity
b. Retention hyperlipemia
c. Transport hyperlipemia

d. Alimentary hyperlipemia
e. Hypertrophic obesity

692. Sol Al(OH)_3 was produced as a result of treatment of freshly prepared Al(OH)_3 precipitate with a small amount of HCl solution. What phenomenon underlies the sol production?
a. Chemical condensation
b. Physical condensation
c. Mechanical dispersion
d. Washing with a solvent
e. Chemical peptization

693. A Gram stained smear shows large oval violet cells that form pseudomycelium. Name these microorganisms:
a. Penicillium fungi
b. Mucor fungi
c. Actinomycetales
d. Plasmodium vivax
e. Candida fungi

694. A patient has acute pancreatitis. What is the leading link in the pathogenesis of this disease?
a. Early activation of trypsin and elastase
b. Disturbed trophism of exocrine pancreatocytes
c. Arterial hypertension
d. Autoallergy
e. Atherosclerosis of pancreatic vessels

695. What is the order of the kinetic equation that describes the process of coagulation according to the Smoluchowski theory of rapid coagulation?
a. Second order
b. Fractional order
c. Third order
d. Zero order
e. First order

696. The mixture being studied contains Mg^2+, Ni^2+, Hg^2+ cations. What reagent allows to detect Ni^2+ cations in the mixtire?
a. Alizarin
b. Magneson I (Azo violet)
c. Dimethylglyoxime
d. Ammonia solution
e. 1-Nitroso-2-naphthol

697. Specify the standard solution (titrant) for the iodometric determination of oxidants:
a. KBrO_3
b. Na_2S_2O_3
c. KMnO_4
d. I_2
e. K_2Cr_2O_7

698. A patient with neuritis takes diazepam. To relieve joint pain, he was prescribed an analgesic in a dose lower than the average therapeutic dose. What phenomenon did the doctor take into account when reducing the dose of the analgesic?
a. Summation
b. Drug addiction
c. Tolerance
d. Material cumulation
e. Potentiation

699. Megaloblasts and a high color index were detected in the patient's blood. The diagnosis of

megaloblastic anemia was established. What drug should be prescribed in this case?
a. Tocopherol acetate
b. Ascorbic acid
c. Cyanocobalamin
d. Rutin
e. Pyridoxine

700. Illegal emigrants from Somalia were detained at the Ukrainian border. During medical examination, their 3-year-old child presents with muscle hypotonia and dystrophy, skin depigmentation, decreased turgor, and enlarged abdomen. The child is underweight. The diagnosis of kwashiorkor was made. This pathology is a type of partial starvation, namely the deficiency of:
a. Proteins
b. Lipids
c. Energy
d. Carbohydrates
e. Vitamins

701. As a result of prolonged starvation, intracellular lipolysis activates in the tissues. What hormone is the activator of this process?
a. Cholecalciferol
b. Oxytocin
c. Insulin
d. Calcitonin
e. Glucagon

702. Most antidepressants are nonselective monoamine oxidase inhibitors (MAOIs) --- they inhibit flavin-containing enzymes that catalyze oxidative deamination of monoamines in the mitochondria of brain neurons. Name the coenzyme of MAO:
a. Nicotinamide adenine dinucleotide
b. Flavin adenine dinucleotide
c. Pyridoxal phosphate
d. Thiamine pyrophosphate
e. Coenzyme A

703. Digestive enzymes produced in pancreas are inactive. What enzyme in intestines starts the transformation process of proenzymes into enzymes?
a. Chymotrypsin
b. Lactase
c. Amylase
d. Aminopeptidase
e. Enterokinase

704. The 55-year-old patient has been diagnosed with angina pectoris. Calcium channel-blocking agent was prescribed for treatment. Name this agent:
a. Amlodipine
b. Atenolol
c. Reserpine
d. Guanethidine
e. Labetalol

705. Etiological factors of infectious diseases can be infectious agents with diverse ultrastructure. Which of the following groups does textbfNOT have cellular structure, protein synthesis, enzymatic and energy systems?
a. Viruses
b. Rickettsia
c. Protozoa
d. Fungi
e. Bacteria

706. What method is used for quantification of magnesium sulfate solution for injections?
a. Iodine monochloride titration
b. Nitritometry
c. Acid-base titration
d. Complexonometry
e. Cerimetry

707. To prevent the development of muscular dystrophy, a doctor prescribed potassium orotate to a patient. This compound is an intermediate product of the synthesis of a certain substance. What substance is it?
a. Cholesterol
b. Bile acids
c. Pyrimidine nucleotides
d. Ketone bodies
e. Glucose

708. 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. Calciferol
b. Cobalamine
c. alpha-tocopherol
d. Glicerol
e. Glucose

709. Examination of a 45-year-old man, who for a long time kept to a vegetarian plant-based diet, revealed him to have negative nitrogen balance. What peculiarity of his diet has caused such developments?
a. Insufficient vitamin content
b. Excessive carbohydrate content
c. Insufficient protein content
d. Excessive water content
e. Insufficient fat content

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

711. A woman underwent a gastroduodeno-scopy that revealed decreased functioning of the gastroesophageal junction with reflux of gastric contents into the esophagus. What sign is the main indicator of this disorder?
a. Problematic swallowing
b. Palpitations
c. Diarrhea
d. Nausea
e. Heartburn

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

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

a. Citrate
b. Alpha-ketoglutarate
c. Malate
d. Fumarate
e. Succinate

714. What ion increases osmotic pressure in the focus of inflammation?

a. Fluorine
b. Calcium
c. Chlorine
d. Magnesium
e. Potassium

715. Racemose clusters of calcium carbonate crystals are detected among the waste products of a protoplast. These crystals are:

a. Isolated crystals
b. Crystal druses
c. Raphides
d. Cystoliths
e. Styloid crystals

716. In nitritometry, titrant is a 0.1 M solution of sodium nitrite that is prepared as a secondary standard solution. What acid is used to determine the exact concentration of sodium nitrite?

a. Sulfanilic
b. Acetic
c. Sulfuric
d. Oxalic
e. Hydrochloric

717. Alkaptonuria is characterized by excessive urinary excretion of homogentisic acid. Development of this disease is associated with metabolism disorder of the following amino acid:

a. Alanine
b. Methionine
c. Tryptophan
d. Asparagine
e. Tyrosine

718. In the epidemiology of certain diseases, a great attention must be paid to fleas as disease carriers. Particularly, the fleas play a major role in the spread of:

a. Anthrax
b. Plague
c. Typhus
d. Relapsing fever
e. Leptospirosis

719. Sabin polyvalent oral vaccine is used for planned immunization of children against poliomyelitis. However, this vaccine is absolutely contraindicated for the:

a. Adolescents
b. Children vaccinated with Salk vaccine
c. Preschoolers
d. Children with congenital or acquired immunodeficiencies
e. Children with recent medical history of infectious diseases

720. A factory that produces biopreparations adds a 0.3--0.4% formalin solution to a bacterial exotoxin. After that, in 3--4 weeks, a medicine is obtained. This medicine is used for specific disease prevention. What vaccines are made this way?

a. Genetically engineered vaccines
b. Chemical vaccines
c. Inactivated vaccines
d. Live vaccines
e. Anatoxin vaccines

721. The titrant of mercurimetry method is:
a. 0,1mol solution of $NaNO_2$
b. 0,1mol solution of $AgNO_3$
c. 0,1mol solution of $Hg_2(NO_3)_2$
d. 0,1mol solution of KSCN
e. 0,1mol solution of NH_4SCN

722. Calendula officinalis as a representative of Asteraceae family can be characterized by the following type of inflorescence:
a. Corymb
b. Umbel
c. Anthodium
d. Capitulum
e. Catkin

723. Bacterioscopy of smears stained according to the Romanowsky-Giemsa technique revealed violet cocci-like microorganisms in the cytoplasm of epithelial cells. What pathogen can be characterized by its intracellular location?
a. Shigella
b. Staphylococci
c. Chlamydia
d. Salmonella
e. Streptococci

724. Potentiometry is one of the electrochemical methods of analysis. This method is based on measuring (determination) of:
a. Zeta-potential
b. Systemic redox potential
c. Reference electrode potential
d. Indicator electrode potential
e. Diffuse layer potential

725. Single-use syringes produced at a medical equipment factory need to be sterilized. What sterilization method would be the most advisable for this type of medical equipment?
a. Pasteurization
b. Autoclaving
c. Tyndallization
d. Radiation sterilization (gamma-radiation)
e. Dry heat

726. Hydrolysis reaction will textbfNOT occur with:
a. Fat
b. Glycerol
c. Cellulose
d. Protein
e. Starch

727. Hormones regulate numerous metabolic processes. What hormone activates glycogen synthesis?
a. Thyroxine
b. Adrenaline
c. Vasopressin
d. Oxytocin
e. Insulin

728. Which compound has the most markedly expressed basic properties?
a. CH_3CH_2SH
b. CH_3CH_2OH
c. CHequiv CH
d. CH_3COOH
e. CH_3CH_2NH_2

729. Name the reactions and reagents that under certain conditions allow determination of certain ions in the presence of other ions:
a. Group
b. Specific
c. Selective
d. General
e. Characteristic

730. A doctor has prescribed an adrenocortical hormone drug for a patient with bronchial asthma. Specify this drug.
a. Atropine sulfate
b. Prednisolone
c. Salbutamol
d. Diclofenac sodium
e. Loratadine

731. During examination of a patient the otolaryngologist noted that the patient's tonsils are extremely swollen, hyperemic, and have gray coating. Microscopy of the coating sample detects there gram-positive bacilli arranged at an angle to each other. What disease can be suspected?
a. Tonsillitis
b. Scarlet fever
c. Diphtheria
d. Meningococcal nasopharyngitis
e. Mumps

732. On the surface of a crystalline substance predominantly those ions are adsorbed that compose the crystalline lattice or are isomorphous to its ions, forming in the process a hard-to-dissolve compound with crystalline ions. Name the author (authors) of this rule:
a. Schulze, Hardy
b. Van 't Hoff
c. Paneth, Fajans
d. Rehbinder
e. Duclaux, Traube

733. A 28-year-old patient has a subfebrile fever. This type of fever is observed when body temperature fluctuates within the following range:
a. 38--39^oC
b. 39--41^oC
c. 37--37.9^oC
d. 36.6--37^oC
e. Over 41^oC

734. In the process of manufacturing live vaccines, the biofactories dry the bacteria and viruses in vacuum at low temperatures, to ensure stability and long shelf-life of the vaccines. Name this method:
a. Sublimation
b. Photoreactivation
c. Sterilization
d. Tyndalization
e. Lyophilization

735. When protective action of proteins weakens, cholesterol accumulates on the vessel walls

because its particles become glued together. Name this phenomenon:
a. Sensitization
b. Thixotropy
c. Synergism
d. Sedimentation
e. Coagulation

736. A chemical analytical laboratory uses a reaction with dimethylglyoxime to identify nickel cations. What will be the color of the precipitate that forms as a result of this reaction?
a. Blue
b. Green
c. Red
d. White
e. Yellow

737. During morphological description of common periwinkle it was defined that it has shoot that trails on the ground and takes root. It allows to chatacterize such shoot as:
a. Creeping
b. Tenent
c. Scandent
d. Recumbent
e. Twining

738. Molar attenuation coefficient is the optical density of a solution with absorbent layer 1 cm thick and concentration that equals:
a. 1 g/mL
b. 1 g/L
c. 1%
d. 1 mol/L
e. 0.1 mol/L

739. It is a known fact, that human body in a day synthesizes approximately 80 g of glucose due to gluconeogenesis. What organ performs this process primarily?
a. Stomach
b. Brain
c. Heart
d. Skeletal muscles
e. Liver

740. Analysis of a sedative herbal tea detects yellow-green infructescences (microstrobiles) formed by bract scales with a tile-like arrangement and small nut-like fruits. What plant can be characterized by such features?
a. Humulus lupulus
b. Juniperus communis
c. Ephedra distachya
d. Alnus glutinosa
e. Schizandra chinensis

741. Examination of a patient by a neurologist has detected the presence of ataxia in the patient. What signs are characteristic of this nervous system disorder?
a. Impaired initiation and planning of movements
b. No movements in the upper limbs
c. No movements in one half of the torso
d. Excessive movements
e. Impaired temporal and spatial movement orientation

742. A patient with bronchial asthma was prescribed a drug with the mechanism of action that is primarily based on the stimulation of beta_2 adrenergic receptors. Name this drug:
a. Droperidol

b. Adrenaline hydrochloride
c. Clonidine
d. Isadrine (Isoprenaline)
e. Salbutamol

743. HIV-infection occupational risk groups include people of various professions, healthcare workers included. Specify the mosl likely route of infection transmission for healthcare workers:
a. Fecal-oral transmission
b. Vector-borne transmission
c. Droplet transmission
d. Parenteral transmission
e. Transmission via airborne dust particles

744. What type of conducting bundle is characteristic of primary anatomical structure of a root?
a. Open collateral
b. Closed collateral
c. Concentric
d. Radial
e. Bicollateral

745. Name the titrimetric method for quantitative determination of phenol and its derivatives:
a. Permanganatometry
b. Nitritometry
c. Bromatometry
d. Cerimetry
e. Ascorbinometry

746. A patient with a cranial trauma has regularly recurring epileptiform seizures. In this case, disturbed metabolism of a certain biogenic amine can be observed. Name this biogenic amine.
a. Indole
b. Putrescine
c. GABA
d. Cadaverine
e. Adrenaline

747. In Allium cepa, the main axis ends in an inflorescence, in which peduncles of the same length emerge from one point. What type of inflorescence is it characteristic of?
a. Raceme
b. Spike
c. Flat capitulum
d. Corymb
e. Umbel

748. What compound is formed as a result of interaction between aniline and concentrated sulfuric acid in a high-boiling solvent and is a structural fragment of a large group of medicines?
a. Uric acid
b. Methylamine
c. Gamma-aminobutyric acid
d. Sulfanilic acid
e. Salicylic acid

749. A 28-year-old man with peptic ulcer of the stomach was prescribed a drug that inhibits gastric juice secretion. Specify this drug:
a. Duphalac (Lactulose)
b. Ethacrynic acid
c. Lidocaine
d. Omeprazole
e. Fenofibrate

750. What medicine must be prescribed to a patient diagnosed with rheumatoid arthritis, if this patient's medical history indicates gastritis as a concomitant diagnosis?
a. Ibuprofen
b. Indomethacin
c. Aspirin (acetylsalicylic acid)
d. Diclofenac
e. Celecoxib

751. Quantitative content of hydrogen peroxide can be determined by means of the following self-indicator method:
a. Permanganatometry
b. Nitritometry
c. Iodometry
d. Bromatometry
e. Argentometry

752. A patient has developed anemia against the background of nonspecific ulcerative colitis. In the blood, there are hypochromia, micro- and anisocytosis, and poikilocytosis. What type of anemia can be suspected in this case?
a. B_12 and folate deficiency
b. Aplastic
c. Sideroblastic
d. Hemolytic
e. Iron deficiency

753. What will be the order of the reaction if one of the reagents participating in a bimolecular reaction was taken in a large excess?
a. Third order
b. Pseudomonomolecular order
c. The order would be the same as the molecularity
d. The order can be determined based on the substance taken in excess
e. The order would be greater than the molecularity

754. What is the mechanism of action of a catalyst in a chemical reaction?
a. Changes the degree of dispersion
b. Increases activation energy
c. Does not change the activation energy
d. Reduces activation energy
e. Changes the nature of the reagents

755. Non-aqueous acid-base titration is used for the substances that have low solubility in water and weak basic or weak acidic properties. Choose the titrant and medium for titration of substances with weak basic properties.
a. HCl solution in anhydrous acetic acid
b. HClO solution in anhydrous acetic acid
c. HCl solution in dioxane
d. HClO_4 solution in anhydrous acetic acid
e. HCl solution in methanol

756. Which phenomenon is uncharacteristic of aerosols?
a. Thermoprecipitation
b. Dissociation
c. Coagulation
d. Photophoresis
e. Thermophoresis

757. Enzymes accelerate biochemical reactions by over 10^8 times. What equation describes the rate of enzymatic catalysis?
a. Michaelis-Menten equation

b. Law of mass action
c. Arrhenius equation
d. Van't Hoff equation
e. Van't Hoff isotherm equation

758. For two weeks, a man has been taking tetracycline without a doctor's prescription for treatment of furunculosis. A yellowish color of the skin and sclera is observed in this man. When interviewing this person, a pharmacist determined that his condition developed after taking the medicines. What type of jaundice has developed in this case?
a. Subhepatic
b. Hemolytic
c. Cholestatic
d. Hepatic
e. Hereditary

759. Phosphate anions and arsenate anions form similar precipitates insoluble in an ammonia solution during their reaction with:
a. Cobalt sulfate solution
b. Magnesia mixture (a solution containing MgCl_2, NH_4Cl, NH_3)
c. Lead acetate solution
d. Nessler's reagent
e. Sodium hydroxide solution

760. Long-term taking of sulfonamides has resulted in the patient developing anemia, leukopenia, and thrombocytopenia. What is the mechanism of development of these disorders?
a. Bone marrow stimulation
b. These disorders have not been caused by the medicines
c. Destruction of blood elements
d. Inhibition of hematopoiesis in the bone marrow
e. Intensified use of blood elements

761. What titrimetry method allows to determine quantitative content of ascorbic acid using starch as an indicator?
a. Nitritometry
b. Titanometry
c. Ferrometry
d. Iodimetry
e. Permanganatometry

762. A 33-year-old woman was admitted into a psychiatric hospital with an anxiety disorder of neurotic origin. What drug is indicated in this case?
a. Droperidol
b. Diazepam
c. Levodopa
d. Valerian extract
e. Naloxone

763. What is the main mechanism of benzylpenicillin bactericidal action on the coccal flora?
a. Activation of macroorganism immune system
b. Disturbed synthesis of microbial cell wall
c. Increased phagocytic activity of leukocytes
d. Inhibition of protein synthesis
e. Disturbed cytoplasmic membrane permeability

764. Pleural tap performed by a doctor has yielded a significant amount of yellow exudate. Microscopy detected neutrophils in the exudate. What type of exudate is it characteristic of?
a. Bloody
b. Fibrinous
c. Purulent

d. Hemorrhagic
e. Serous

765. What anticholinesterase agent is used to stimulate intestinal peristalsis in the patients during the postoperative period?
a. Metoprolol
b. Adrenaline hydrochloride
c. Salbutamol
d. Dithylin (Suxamethonium)
e. Prozerin (Neostigmine)

766. What cation of the V analytical group (acid-base classification) is present in the solution, if a black precipitate is produced when tin(II) chloride dissolved in an alkaline medium is added into this solution?
a. Iron(II)
b. Antimony(III)
c. Manganese(II)
d. Iron(III)
e. Bismuth(III)

767. A 5-year-old child after drinking milk often develops the following symptoms: abdominal distension, spastic pain and diarrhea. These symptoms develop after 1-4 hours after single instance of taking milk. What enzymes are deficient, thus, causing the described symptomatology?
a. Maltolytic
b. Lactolytic
c. Sucrolytic
d. Fructolytic
e. Glucolytic

768. How many atoms does a furanose cycle consist of?
a. 7
b. 5
c. 3
d. 6
e. 4

769. If the amount of a high molecular substance added into a sol is very small, then a decrease in its stability, instead of an increase, can occur. What is the name of this phenomenon?
a. Sensitization
b. Sedimentation
c. Syneresis
d. Synergism
e. Solubilization

770. Primary protein structure is formed as the result of amino acid polymerization. What bonds between the amino acid residues are characteristic of this structure?
a. Hydrogen
b. Ion interaction
c. Peptide
d. Hydrophobic
e. Electrostatic

771. The stem surface of a woody plant is being studied. It is noted that the cells are parenchymal, dead, with suberized membranes. Therefore, this is:
a. Sclerenchyma fibers
b. Cork
c. Phelloderm
d. Phellogen
e. Vessels

772. When hydrogen peroxide solution is administered to bleeding wounds, it is broken up by one of the blood enzymes. Point out this enzyme:
a. Aspartate aminotransferase
b. Catalase
c. Cytochrome oxidase
d. Monoamine oxidase
e. Lactate dehydrogenase

773. After parenteral administration of iron preparations, the patient presents with pain behind the sternum and redness of the face and neck. What drug should be administered in this case?
a. Vitamin A
b. Cyanocobalamin
c. Ascorbic acid
d. Deferoxamine
e. Folic acid

774. What changes occur with the entropy of an isolated system, when it spontaneously approaches the equilibrium state?
a. Does not change
b. Reaches its maximum
c. Decreases linearly
d. Reaches its minimum
e. Tends to infinity

775. Integumentary tissue of roots consists of cells with thin cellulose mebranes and protuberances - root hairs. This tissue is:
a. Plerome
b. Epiblema
c. Periderm
d. Phelloderm
e. Periblem

776. To reproduce Ehrlich carcinoma in a rabbit, a certain amount of benzpyrene (a polycyclic aromatic hydrocarbon) was daily applied to a dehaired patch of skin of the animal. What method is used for tumor modelling in this case?
a. Ionizing radiation
b. Transplantation
c. Explantation
d. Induction
e. Hormone administration

777. The mother of a 3-year-old child was taking antibiotics during her pregnancy. The child presents with destruction of the incisors and a brown border on the gums. What antibiotic has caused this side effect?
a. Ciprofloxacin
b. Levomycetin (Chloramphenicol)
c. Doxycycline hydrochloride
d. Co-amoxiclav
e. Azithromycin

778. In qualitative analysis, a reaction with an iodine solution is used to detect arsenite ions. What is used to create the medium for this purpose?
a. Ammonia solution
b. Saturated solution of sodium hydrogencarbonate
c. Acetic acid solution
d. Sulfuric acid solution
e. Nitric acid solution

779. Nitritometry is used to determine primary aromatic amines. What indicator is used in the

process?
a. Phenolphthalein
b. Tropaeolin 00
c. Methyl orange
d. Eosin
e. Potassium chromate

780. What substance forms colloid solution when dissolved in water?
a. Sodium sulfate
b. Sucrose
c. Collargol
d. Potassium gluconate
e. Silver nitrate

781. The absorption zone of the primary anatomical root cortex mainly consists of multi-layered, live, loose parenchyma with starch granules. What tissue is described above?
a. Periderm
b. Ectodermis
c. Mesodermis
d. Hypodermis
e. Endodermis

782. What conditions are necessary for the formation of crystalline precipitates?
a. Rapid precipitation in hot concentrated solutions
b. Rapid precipitation in hot dilute solutions
c. Slow precipitation in cold concentrated solutions
d. Slow precipitation in cold dilute solutions
e. Slow precipitation in hot dilute solutions

783. Pharmacopoeia reaction of potassium ferrocyanide with zinc cations produces:
a. Red precipitate
b. White precipitate
c. Violet precipitate
d. Black precipitate
e. Yellow precipitate

784. A pregnant woman was administered fenoterol to reduce the uterine tone for the correction of her labor activity. What is the mechanism of the uterolytic effect of this drug?
a. Stimulation of alpha_1-adrenoceptors of the uterus
b. Stimulation of beta_2- and alpha_1-adrenoceptors of the uterus
c. Direct antispasmodic effect
d. Stimulation of beta_2-adrenoceptors of the uterus
e. Blocking beta_2-adrenoceptors of the uterus

785. A patient came to the pharmacy to obtain a drug that contains pancreatic enzymes and can be taked for chronic pancreatitis. What drug would be recommended by the dispensing chemist?
a. Pirenzepine
b. Triamcinolone
c. Gordox (Aprotinin)
d. Omeprazole
e. Pancreatine

786. How will the rate of the chemical reaction 2NO(gas) + O_2(gas) = 2NO_2(gas) change if the pressure increases by three times?
a. The rate will remain unchanged
b. The rate will increase by 27 times
c. The rate will increase by three times
d. The rate will decrease by 27 times
e. The rate will decrease by three times

787. Vitamin B_6 is a part of the pyridoxal phosphate coenzyme (PLP). What reactions involve PLP?
a. Decarboxylation and transamination of amino acids
b. Synthesis of bile acids and cholesterol
c. Synthesis of steroid hormones and cholesterol
d. Synthesis of ketone bodies and bile acids
e. Synthesis of nucleic acids and phospholipids

788. A doctor prescribed metoprolol to a patient, which helped to lower the patient's blood pressure. This drug belongs to the following pharmacological group:
a. Beta-blockers
b. Sympatholytics
c. Nicotinic antagonists
d. Alpha-blockers
e. Muscarinic antagonists

789. What type of colloidal systems are foams?
a. Liquid-solid
b. Liquid-liquid
c. Gas-gas
d. Gas-liquid
e. Solid-liquid

790. The patient's 24-hour urine output is 6 liters, its specific gravity varies from 1003 to 1008 g/L. What pathological process can be characterized by these signs?
a. Diabetes insipidus
b. Hypothyroidism
c. Acute renal failure
d. Diabetes mellitus
e. Chronic renal failure

791. A patient has developed megaloblastic anemia on a background of alcoholic hepatocirrhosis. 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

792. A colloidal system can be purified using filtration under excess pressure through a semipermeable membrane. Name this purification method.
a. Diffusion
b. Dialysis
c. Filtration
d. Ultrafiltration
e. Electrodialysis

793. What physical phenomenon is measured using stalagmometry?
a. Isoelectric point
b. Osmotic pressure
c. Molecular mass
d. Surface tension
e. Concentration

794. What reagent allows distinguishing between maltose (a reducing disaccharide) and sucrose (a non-reducing disaccharide)?
a. FeCl_3
b. Br_2
c. Tollens reagent
d. NaOH

e. K_4[Fe(CN_6)]

795. The patient with alcoholic cirrhosis complains of general weakness and dyspnea. The following is revealed: decrease of arterial pressure, ascites, dilation of stomach anterior wall superficial veins, esophageal varicose veins dilatation, splenomegaly. What haemodynamics disorder does the patient suffer from?

a. Portal hypertension

b. Cardiac insufficiency

c. Right ventricular failure

d. Collapse

e. Left ventricular failure

796. A doctor prescribed diazepam to a patient with anxiety disorders. What pharmacological effect of the drug is the cause of such a prescription?

a. Antianginal

b. Anxiolytic

c. Anticonvulsant

d. Anti-inflammatory

e. Hypotensive

797. A female patient with mycoplasmal pneumonia was prescribed doxycycline. What group of antibiotics does this drug belong to?

a. Macrolides

b. Cephalosporines

c. Tetracyclines

d. Lincosamides

e. Penicillines

798. Mycorrhiza on the oak roots is a symbiosis of:

a. Bacterium and higher plant

b. Fungus and higher plant

c. Fungus and alga

d. Fungus and bacterium

e. Two different bacteria

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

a. Insulin

b. Cachexin

c. Glucagon

d. Somatotropin

e. Aldosterone

800. 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. Reversible

b. Diluted

c. Concentrated

d. Highly concentrated

e. Direct

801. What antidote must be used in case of narcotic analgesics overdose?

a. Unithiol (Dimercaptopropansulfonate sodium)

b. Diazepam

c. Caffeine and sodium benzoate

d. Naloxone

e. Calcium chloride

802. Atropine sulfate belongs to the following group of drugs:

a. Nicotinic antagonists
b. Tranquilizers
c. Muscarinic antagonists
d. alpha-adrenergic agonists
e. beta-adrenergic agonists

803. A 35-year-old woman came to a doctor with complaints of headache, insomnia, loss of appetite, abdominal pain, a fever of 39--40^oC, and a rash that appeared on her abdomen. The woman was clinically diagnosed with typhoid fever. A sample of patient's blood serum was sent to a laboratory for serological testing with antibody detection. What serological test must be performed to confirm this diagnosis?
a. Immunofluorescence assay
b. Ascoli precipitation test
c. Wasserman complement fixation test
d. Widal agglutination test
e. Hemagglutination inhibition assay

804. In the qualitative analysis which involves precipitation of sulphates of the third analytical group cations (Ca^2+, Sr^2+, Ba^2+) the solubility of sulphates can be reduced by adding:
a. Benzene
b. Distilled water
c. Ethyl alcohol
d. Chloroform
e. Amyl alcohol

805. Production of digestive juices by gastrointestinal tract mucosa is regulated by various factors. What local hormone can affect this process?
a. Bradykinin
b. Angiotensin
c. Endorphin
d. Gastrin
e. Calcitriol

806. What reaction is the common reaction for detection of arsenic(III) and arsenic(V) compounds?
a. Reaction with sodium nitrate
b. Reaction with potassium iodide
c. Reaction with iodine
d. Reaction of reduction to arsine
e. Reaction with ammonium molybdate

807. During a hypertensive crisis, magnesium sulfate was administered to the patient, resulting in a sharp decrease of blood pressure. What drug can be administered to eliminate the side effects of magnesium sulfate?
a. Potassium chloride
b. Calcium chloride
c. Sodium bromide
d. Trilon B (disodium EDTA)
e. Sodium sulfate

808. Allopurinol is used to reduce the formation of uric acid in the treatment of gout. What enzyme does this compound inhibit?
a. Arginase
b. Xanthine oxidase
c. Lactate dehydrogenase
d. Catalase
e. Amylase

809. During examination a woman presents with enlarged thyroid gland, exophthalmos, increased basal metabolism and heat production, tachycardia, tearfulness, and nervousness. This clinical

presentation is characteristic of the following disease:
a. Diabetes mellitus
b. Cushing's disease
c. Hypothyroidism
d. Thyrotoxicosis
e. Addison's disease

810. A laboratory has conducted a soil study to identify the causative agents of an anaerobic infection. Spore-forming is a characteristic feature of these bacteria. What staining technique can be used to detect spores?
a. Morozov stain
b. Romanowsky-Giemsa stain
c. Ozheshko stain
d. Neisser stain
e. Burri-Gins stain

811. A patient developed anaphylactic shock after administration of lidocaine. What antibodies cause the development of this allergic reaction?
a. IgG
b. IgE
c. IgA
d. IgD
e. IgM

812. Every year in autumn a coniferous tree from the Gymnospermae subdivision undergoes defoliation of its soft needles situated on short shoots. It is characteristic of the following genus:
a. Abies
b. Picea
c. Cedrus
d. Larix
e. Pinus

813. Thermolabile medicinal preparation for extemporal use was heated to 65^oC thrice with intervals of one day between the heatings. What method of sterilization was used in this case?
a. Tyndallization
b. Koch's steam sterilization
c. Pasteurization
d. Filtration
e. Calcination

814. During a preoperative examination, prothrombin deficiency was detected in the patient's blood. What must be prescribed in this case in advance to reduce the blood loss during the surgery?
a. Vicasol (Menadione)
b. Contrykal (Aprotinin)
c. Aminocaproic acid
d. Phenylin (Phenindione)
e. Thrombin

815. A man presents with signs of albinism: blonde hair, extreme photosensitivity, impaired vision. What amino acid metabolism is disturbed in the patient?
a. Proline
b. Valine
c. Tyrosine
d. Methionine
e. Histidine

816. Hormone-like substances from the group of eicosanoids can be used to stimulate labor activity during childbirth and as contraceptives. What substances have this effect?
a. Enkephalins

b. Angiotensins
c. Prostaglandins
d. Endorphins
e. Interleukins

817. What solution is used as a process solution (titrant) in alkalimetry?
a. Ammonium hydroxide
b. Hydrochloric acid
c. Potassium hydroxide
d. Oxalic acid
e. Sodium tetraborate

818. Streptomycin like other aminoglycosides, by binding to the 30S subunit of ribosomes, prevents the attachment of formylmethionyl-tRNA) What process is being disrupted as a result of this effect?
a. Translation termination
b. Replication initiation
c. Transcription termination
d. Translation initiation
e. Transcription initiation

819. Name the process, when the precipitate obtained as a result of coagulation transforms into a stable colloidal solution.
a. Flocculation
b. Colloidal protection
c. Micelle formation
d. Peptization
e. Heterocoagulation

820. A 58-year-old man presents with a peripheral circulation disorder with a restricted arterial inflow, paleness of the affected area, and decrease of partial oxygen pressure in the affected area. Name this disorder:
a. Venous hyperemia
b. Thrombosis
c. Reperfusion syndrome
d. Arterial hyperemia
e. Ischemia

821. Electrolytic dissociation is one of the quantitative characteristics of electrolytes. What is used to determine the degree of electrolytic dissociation?
a. The ratio of the number of dissociated molecules to the total number of solute molecules
b. The ratio of the number of non-dissociated solute molecules to the total number of ions
c. The ratio of the number of non-dissociated molecules to the number of dissociated solute molecules
d. The ratio of the solution concentration to the total number of dissociated solute molecules
e. The product of the number of dissociated and non-dissociated solute molecules

822. Examination of the patient's oral cavity detects roseola rash, pustules, and papules on the mucosa of the soft palate. Microscopy of the smears prepared from the discharge and stained according to Romanowsky-Giemsa revealed pale pink wavy microorganisms. What microorganisms are the likely cause of this pathology?
a. Treponema pallidum
b. Staphylococci
c. Candida fungi
d. Streptococci
e. Meningococci

823. Cellulose hydrolysis produces the following disaccharide:
a. Cellobiose
b. Maltose

c. Glucose
d. Sucrose
e. Lactose

824. A patient with arthritis of the knee had been prescribed a certain drug for pain management. With time this drug provoked development of peptic ulcer disease of the stomach in this patient. Name this drug:
a. Fentanyl
b. Diazepam
c. Novocaine
d. Phenobarbital
e. Diclofenac sodium

825. Liquid dosage forms that contain camphor and chloral hydrate are used in dental practice. What phases are in the state of equilibrium at the eutectic point of the melting point diagram of the camphor-chloral hydrate mixture?
a. Eutectic melt, camphor crystals, chloral hydrate crystals
b. Eutectic melt, camphor crystals
c. Eutectic melt, chloral hydrate crystals
d. Camphor crystals, chloral hydrate crystals
e. Eutectic melt

826. The brain is higly dependent on its supply with oxygen and energy substrates. Under physiological conditions, neurons utilize the following as an energy substrate:
a. Bilirubin
b. Glucose
c. Amino acids
d. Higher fatty acids
e. Cholesterol

827. A patient was urgently brought to the infectious diseases hospital. The patient developed severe neurologic disorders 4 hours after he had eaten canned fish. A filtrate was prepared from the remains of this food product and given intraperitoneally to a guinea pig. 3 hours later the animal died. What disease can be suspected?
a. Salmonellosis
b. Q fever
c. Botulism
d. Typhoid fever
e. Brucellosis

828. Datura stramonium fruit is a:
a. Silicular capsule
b. Pseudomonocarpous drupe
c. Spiny capsule
d. Trihedral nutlet
e. Legume with two seeds

829. Upon examination of a flower it is determined to have one pistil made up of single free carpel. Therefore, this gynoecium can be identified as:
a. Lysicarpous
b. Syncarpous
c. Apocarpous
d. Paracarpous
e. Monocarpous

830. What method of titrimetric analysis is used to quantify streptocide (sulfanilamide) with a KBrO_3 solution in the presence of KBr?
a. Bromatometry
b. Vanadatometry

c. Permanganometry
d. Iodometry
e. Dichromatometry

831. In the process of systematic analysis there is a need to separate PbSO_4 from mixture of the 3rd analytical group cation sulphates. Which of the following suits most towards this end?
a. Processing precipitate with acetate acid solution
b. Precipitate recrystallization
c. Processing precipitate with concentrated sulfate acid
d. Processing precipitate with ammonia solution
e. Processing precipitate with 30% ammonium acetate solution

832. A 50-year-old man with a history of alcoholic cirrhosis complains of dyspeptic disorders and bleeding from hemorrhoidal veins. Examination detects ascites and distended superficial veins of the anterior abdominal wall. What pathology is indicated by these signs?
a. Intestinal obstruction
b. Hepatitis
c. Portal hypertension
d. Peptic ulcer disease
e. Enterocolitis

833. One of the cations of the 1st group hinders detection of the others. Therefore, it should be detected first and then extracted. Name this cation:
a. Na^+
b. NH^4+
c. Ca^2+
d. Li^+
e. K^+

834. What test is used for identification of uric acid and other compounds with purine nucleus?
a. Murexide reaction
b. Lucas reagent
c. Fehling reagent
d. Copper mirror reaction
e. Silver mirror reaction

835. Biopotentials caused by various physiological processes are the result of the following forming at the phase interface:
a. Absorption layer
b. -
c. Diffuse layer
d. Electrical double layer
e. Adhesive layer

836. A 55-year-old man suffers from peptic ulcer disease of the stomach. What can be identified as an aggressive factor in this case?
a. Regeneration of the gastric mucosal epithelium
b. Intestinal mucosal barrier
c. Prostaglandin E
d. Adequate blood supply to the gastric mucosa
e. Helicobacter pylory

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

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

839. What substance is deposited in the proteoplasts of seed cells of higher plants in the form of crystals and simple and complex aleurone grains?
a. Protein
b. Glycogen
c. Inulin
d. Starch
e. Fatty oil

840. What substance is a unique accumulator, donor, and transformer of energy within the body?
a. Creatine phosphate
b. Acetyl-CoA
c. Adenosine triphosphate
d. Phosphoenolpyruvate
e. Succinyl-CoA

841. Potentiometry is widely used in the analysis of medicinal products. What type of galvanic cell has the electromotive force that does not depend on the value of the standard electrode potential?
a. Reversible galvanic cell
b. Concentration galvanic cell
c. Galvanic cell without ion transfer
d. Galvanic cell with ion transfer
e. Chemical galvanic cell

842. Some medicines are colloidal solutions. Stabilizers are added to them to increase their aggregate stability. What substances are called stabilizers?
a. Substances that can increase the interfacial tension
b. Substances that can be adsorbed and reduce the interfacial tension
c. Substances that have no effect on the interfacial tension
d. Substances that can increase the free energy of a system
e. Substances that first increase the interfacial tension, and then reduce it over time

843. A fibrinolysis inhibitor was used to stop postpartum bleeding. Name this drug.
a. Nettle leaves
b. Aminocaproic acid
c. Calcium chloride
d. Thrombin
e. Hemostatic sponge

844. Quantitative determination of iodides by Fajans method is performed with adsorption indicators. The following can be used as an adsorption indicator:
a. Diphenylamine
b. Eosin
c. Phenolphthalein
d. Murexide
e. Methyl orange

845. What emulsions can be stabilized by emulsifiers, if the solubility of these emulsifiers is higher in water than in oil?
a. Invert emulsions
b. Dilute emulsions
c. Direct emulsions

d. Emulsions of the second type
e. Concentrated emulsions

846. Which of the following reactions is required in order to obtain an azo dye out of an aromatic amine?
a. Salt formation and nitration
b. Alkylation and nitrosation
c. Reduction and diazotization
d. Diazotization and interaction with potassium cyanide
e. Diazotization and azo compound

847. When herbal raw material of Calendula officinalis and Matricaria chamomilla is being harvested, inflorescences of the following type are being collected:
a. Corymb
b. Spike
c. Capitulum
d. Anthodium
e. Umbel

848. Heparin was prescribed as a part of complex therapy for myocardial infarction. This drug belongs to the following group:
a. Detoxifiers
b. Direct anticoagulants
c. Coagulants
d. Vitamin preparations
e. Hormonal preparations

849. Trypsin is a proteolytic enzyme used to clean purulent wounds. Combined with water, it causes the breakdown of complex organic compounds (proteins, peptides) into simpler ones. According to the modern international Nomenclature and Classification of Enzymes, trypsin belongs to:
a. Transferases
b. Oxidoreductases
c. Isomerases
d. Hydrolases
e. Ligases

850. What hormone can provoke an increase in blood pressure and elevated blood levels of glucose and lipids in a patient with hypotension, who has taken it as a component of a drug?
a. Testosterone
b. Adrenaline
c. Folliculin
d. Progesterone
e. Insulin

851. Collagen, gelatin, keratin, and myosin are the proteins that are formed with peptide bonds and resemble long threads in shape. Name this type of proteins:
a. Chain proteins
b. -
c. Fibrillar proteins
d. Structured proteins
e. Globular proteins

852. A unilocular, single-seeded fruit has a pericarp with an exocarp, a juicy mesocarp, and a lignified endocarp. What plant is it characteristic of?
a. Quercus robur
b. Potentilla erecta
c. Coriandrum sativum
d. Leonurus quinquelobatus
e. Armeniaca vulgaris

853. What mucolytic agent would you recommend for the patient with acute bronchitis to facilitate expectoration?
a. Acetylcysteine
b. Hydrocodone
c. Codeine
d. Libexin (Prenoxdiazine)
e. Glaucine

854. Alkaptonuria is caused by a hereditary disorder of the metabolism of a certain amino acid. Name this amino acid.
a. Arginine
b. Tyrosine
c. Tryptophan
d. Alanine
e. Phenol

855. Rapid growth of tumor node and its progressing malignant change (malignization) is observed in a patient. The described developments are characteristic of the following stage of tumor growth:
a. Exudation
b. Inactivation
c. Transformation
d. Promotion
e. Progression

856. What broad-spectrum antibiotic is contraindicated for children under 14 years of age because it disrupts the formation of the skeleton?
a. Ceftriaxone
b. Azithromycin
c. Doxycycline
d. Acyclovir
e. Ampicillin

857. A woman with essential hypertension developed a dry hacking cough as a result of taking angiotensin-converting enzyme inhibitors. What drugs that inhibit the renin-angiotensin system should be prescribed in this case?
a. Calcium channel blockers
b. Diuretics
c. Angiotensin II receptor antagonists
d. Beta-blockers
e. Sympatholytics

858. A man suffers from cholelithiasis. What medicine should he be prescribed for biliary colic relief?
a. Contrykal (Aprotinin)
b. Pancreatin
c. Bisacodyl
d. Almagel (Algeldrate + magnesium hydroxide)
e. Magnesium sulfate

859. During invasive surgery with muscle relaxant applied a patient developed breathing disruption that was normalised by administering proserin. How can this drug interaction be described?
a. Cumulation
b. Tachyphylaxis
c. Synergism
d. Incompatibility
e. Antagonism

860. What potential forms at the interface between two solutions?
a. Electrokinetic potential
b. Contact potential

c. Diffusion potential
d. Electrode potential
e. Surface potential

861. Examination of the sputum of a patient with suspected pneumonia detects blue-violet lanceolate cocci with a capsule, arranged in pairs. What staining method has been used to detect the capsule?
a. Gram stain
b. Neisser stain
c. Ziehl-Neelsen stain
d. Burri-Gins stain
e. Ozheshko stain

862. Rapid analysis of benzoate ions by means of Pharmacopoeia reaction with iron(III) chloride produces:
a. Blue precipitate
b. Black precipitate
c. Green precipitate
d. Pink-yellow precipitate
e. Red precipitate

863. Ammonia is a toxic substance that is especially dangerous for the brain. In the human body, the main product of ammonia neutralization and excretion is urea. Name the process of urea synthesis.
a. Cori cycle
b. Linen cycle
c. Shemin-Rittenberg cycle
d. Krebs ornithine cycle
e. Citric acid cycle

864. For eczema treatment, a doctor has prescribed the patient a medicine that must be applied transdermally. What is the maximum number of microbial bodies allowed in 1 g of this product, according to the regulations of the WHO and the Pharmacopoeia?
a. A total of 500 bacteria and fungi
b. 100 bacteria and 50 fungi
c. A total of 1000 bacteria and fungi
d. 100 bacteria and 100 fungi
e. A total of 100 bacteria and fungi

865. A patient with bronchial asthma and pulmonary emphysema presents with dyspnea, sensation of lack of air. What type of hypoxia does this patient have?
a. Tissue
b. Hemic
c. Respiratory
d. Exogenic
e. Circulatory

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

867. Inhibitors of a certain enzyme from amines metabolism are used to treat depression. What enzyme is inhibited to achieve this effect?
a. Formylkynureninase (Arylformamidase)
b. Acetylcholinesterase
c. Monoamine oxidase with flavine adenine dinucleotide
d. Kynurenine-3-hydroxylase
e. Lactate dehydrogenase

868. Permanganatometry is used in determination of many organic and inorganic compounds. What are the main advantages of permanganatometry over the other oxidimetric methods?
a. High selectivity and sensitivity when determining compounds
b. Pure potassium permanganate is easily available and obtainable
c. Various types of indicators can be used; in some cases catalysts are necessary to accelerate the reaction
d. Sufficiently high stability of potassium permanganate and its solutions
e. Sufficiently high redox potential; it is possible to determine titration end-point without indicator

869. A patient with bronchial asthma had been prescribed salbutamol, which led to disappearance of bronchiospasm symptoms. It happened due to stimulation of:
a. beta_2-adrenoreceptors
b. beta_1-adrenoreceptors
c. Muscarinic acetylcholine receptors
d. Acetylcholine synthesis
e. alpha_1-adrenoreceptors

870. The patient has icteric skin; unconjugated bilirubin content in blood is high; conjugated bilirubin in urine is not detected. There is significant amount of urobilin in urine and stercobilin in feces. Name the pathology characterized by the given symptoms:
a. Atherosclerosis
b. Obstructive jaundice
c. Hemolytic jaundice
d. Hepatocellular jaundice
e. Jaundice of the newborn

871. Aggression enzymes are characteristic of pathogenic microorganisms. Select one such aggression enzyme from the list.
a. Transferase
b. Lyase
c. Lecithinase
d. Catalase
e. Lactamase

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

873. Leaves damage by mosaic discoloration has been detected at medicinal plantations. What microorganisms are the cause?
a. Protozoa
b. Rickettsia
c. Plant-pathogenic bacteria
d. Plant-pathogenic fungi
e. Plant-pathogenic viruses

874. A hospitalised patient was diagnosed with immunity deficiency that resulted in low resistance against viral infection. What cells are most probably deficient?
a. B-lymphocytes
b. Fibroblasts
c. Macrophages
d. Neutrophiles
e. T-lymphocytes

875. A doctor needs to prescribe the patient a drug for replacement therapy after thyreoidectomy. What drug would you recommend?

a. Thiamazole
b. L-thyroxine
c. Prednisolone
d. Parathyroidin
e. Insulin

876. Ammonium thiocyanate solution was added into the solution being studied. The resulting solution colored red. This analytical effect indicates the presence of the following cation:
a. Iron(III)
b. Mercury(I)
c. Mercury(II)
d. Silver
e. Lead(II)

877. Potassium iodide solution has been added to the solution containing cations of the sixth analytical group (acid-base classification). It resulted in the red precipitate soluble in excess of reagent. What cations are present in the solution?
a. Cadmium
b. Mercury (II)
c. Bismuth
d. Nickel
e. Cobalt (II)

878. What hormone can cause hypernatremia and hypokalemia, if its secretion becomes increased?
a. Parathormone
b. Adrenaline
c. Aldosterone
d. Atrial natriuretic hormone (peptide)
e. Glucagon

879. Anionites are the adsorbents that can:
a. Adsorb ions from the medium
b. Replace their own anions with anions of the medium
c. Replace their own ions with molecules of the medium
d. Replace their own cations with cations of the medium
e. Adsorb molecules from the medium

880. During practical field session students have detected plant with diversity of leaves that differ by their placement on stem, parts development, size, shape, lamina division. This phenomenon is called:
a. Heterophylly
b. Leaf mosaic
c. Venation
d. Phyllotaxy
e. Metamorphosis

881. The State Pharmacopoeia of Ukraine includes the method of determining molar mass of a polymer, which is based on the following property of high-molecular substances:
a. Light scattering
b. Saturated vapor pressure
c. Freezing point
d. Viscosity
e. Osmotic pressure

882. 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. Bacteria
b. Mycoplasma

c. Fungi
d. Viruses
e. Ray fungi

883. Tests for agglutination and lysis of the Leptospira bacteria are used in microbiological diagnostics of leptospirosis. How should these tests be evaluated?
a. With agglutinoscope
b. Against dark background
c. With unaided eye
d. With microscope set at low magnification
e. With dark field method

884. The leaves of a Lamiaceae family plant are ovate, with a pointed tip, crenate leaf edge, and a lemon scent, which is characteristic of the following plant:
a. Lamium album
b. Melissa officinalis
c. Leonurus cardiaca
d. Mentha piperita
e. Salvia officinalis

885. What geometrical shape does methane molecule have?
a. Triangular
b. Tetrahedral
c. Planar
d. Linear
e. Spherical

886. In practical classes the group of students have to explore the chemical structure of glucose molecule. Which of the following suits most for simultaneous detection of aldehyde group and glycol fragment in previously mentioned molecule?
a. FeCl_3
b. Cu(OH)_2
c. KMnO_4
d. Br_2
e. AlCl_3

887. According to Hueckel's rule an organic compound will have aromatic properties if:
a. There is only one substituent in the molecule
b. There is a cyclohexane ring in the molecule
c. Its molecular structure contains a planar cycle with a closed conjugated system that contains (4n+2) of pi electrons, where n = 0,1,2,3, etc.
d. There are condensed nuclei in the molecule
e. Its molecules are composed exclusively of carbon and hydrogen atoms that form a linear carbon chain

888. Microscopy of a rhizome revealed periphloematic vascular bundles. What plant does it belong to?
a. Acorus calamus
b. Elymus repens
c. Potentilla erecta
d. Dryopteris filix-mas
e. Convallaria majalis

889. Jelly is one of the promising dosage forms. Name the process, when the initial structure of a mechanically destroyed jelly spontaneously restores:
a. Syneresis
b. Diffusion
c. Thixotropy
d. Gelation
e. Stratification

890. Name the type of an inflorescence that has an elongated and thickened main axis with sessile flowers:
a. Spadix
b. Spike
c. Round capitulum
d. Umbel
e. Flat capitulum

891. A woman with peptic ulcer disease of the stomach was prescribed antibacterial treatment. It is aimed at the following pathogen:
a. E) colli
b. H. pylori
c. Cl. trachomatis
d. St. aureus
e. Cl. perfringens

892. Narcotic analgesics can induce constipations in a patient. What receptors are affected in such cases?
a. Glutamate receptors
b. Dopamine receptors
c. Chemoreceptors
d. Opiate receptors
e. Mechanoreceptors

893. 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 this type of pathologic respiration:
a. Biot's
b. Gasping
c. Kussmaul's
d. Cheyne-Stokes'
e. Stenotic

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

895. A patient has developed anuria due to a severe blood loss (40% of blood volume). What is the leading mechanism of anuria development in this case?
a. Increased pressure in the glomerular capsule
b. Increased oncotic blood pressure
c. Decreased hydrostatic pressure in the glomerular capillaries
d. Decreased pressure in the glomerular capsule
e. Decreased number of functional glomeruli

896. During active muscle work, anaerobic glycolysis is the main source of energy, causing the accumulation of lactate in the muscles, the level of which gradually decreases. During what interorgan cycle does the utilization of lactate take place afterwards?
a. Cori cycle
b. Urea cycle
c. Knoop-Lynen cycle
d. Pentose phosphate cycle
e. Krebs cycle

897. An athlete is recommended to take carnitine to improve his achievements. What process does

carnitine activate?
a. Vitamin K transport
b. Fatty acids transport
c. Vitamin B_12 transport
d. Glucose transport
e. Amino acids transport

898. In recent decades, the etiological role of viruses in the occurrence of cervical cancer has been proven. Name these viruses.
a. Cytomegalovirus
b. Human papillomaviruses
c. HTLV-1 and HTLV-2
d. Herpes simplex virus type 2
e. Adenoviruses

899. Chemical equilibrium theory allows predicting the approaches that result in the maximum yield of medicines. What factor has no effect on the chemical equilibrium shift?
a. Addition of a catalyst
b. Temperature change
c. A change in the concentration of the initial substances
d. Pressure change
e. A change in the concentration of products

900. A patient developed candidiasis caused by long-term antibiotic treatment. What drug should be used in this case to eliminate candidiasis?
a. Sulfadimezin (Sulfadimidine)
b. Nystatin
c. Rubomycin (Daunorubicin)
d. Fumagillin
e. Interferon

901. What is the mechanism of Br_2 attaching to propene?
a. S_R
b. A_E
c. A_N
d. S_N
e. S_E

902. A woman with chronic heart failure developed an edematous syndrome. Increased aldosterone levels were detected in her blood. What drug must be prescribed in this case?
a. Metoprolol
b. Proserine (Neostigmine)
c. Ketamine
d. Spironolactone
e. Aceclidine

903. Human body assimilates fats only as emulsions. Vegetable oils and animal fats contained in food are emulsified when exposed to bile (an emulsifier). How does interface tension change in this case?
a. Remains unchanged
b. First increases, than decreases
c. Increases
d. First decreases, than increases
e. Decreases

904. A patient developed an atrioventricular block. What drug is indicated in this case?
a. Clophelin (Clonidine)
b. Anaprilin (Propranolol)
c. Atropine
d. Metoprolol

e. Pirenzepine

905. What pathologies facilitate cumulation of drugs?
a. Diseases of liver and kidneys
b. Diseases of respiratory tracts
c. Diseases of locomotor apparatus
d. Diseases of CNS
e. Diseases of connective tissue

906. What pharmacological effect of acetylsalicylic acid allows using it for prevention of thrombosis in patients with ischemic heart disease?
a. Ulcerogenic
b. Anti-inflammatory
c. Antiaggregant
d. Analgesic
e. Antipyretic

907. A woman, who during the 5th-10th weeks of her pregnancy had been taking sodium valproate for treatment of her epilepsy, gave birth to a child with pathology of the vertebral column (split spine). What side effect of the drug caused such malformation?
a. Sensitizing
b. Teratogenic
c. Embryotoxic
d. Fetotoxic
e. Mutagenic

908. Silver nitrate solution has been added to the solution containing anions of the first analytical group. It resulted in yellow precipitate. That means the following are present in the solution:
a. Iodide ions
b. Bromide ions
c. Sulphate ions
d. Arsenite ions
e. Arsenate ions

909. In a patient with jaundice, increased levels of direct bilirubin and cholemia were detected in the blood. No stercobilinogen was detected in urine. What disorder is observed in this case?
a. Hemolytic jaundice
b. Gilbert's syndrome
c. Parenchymal jaundice
d. Crigler-Najjar syndrome
e. Mechanical jaundice

910. An outbreak of acute intestinal infection occurred in a kindergarten. An epidemiological laboratory team has conducted an examination of hand lavage of kitchen workers. What microorganisms in the hand lavage can indicate a fecal contamination?
a. Actinomycetes
b. S. aureus
c. E) coli
d. Streptomycetes
e. C) albicans

911. What reagent can be used to distinguish between ethanol (C_2H_5OH) and glycerine?
a. FeCl_3
b. KMnO_4
c. HBr
d. Cu(OH)_2
e. Ag_2O

912. Name the state of colloidal particles that has zero electrokinetic potential and can be

characterized by the absence of directed movement of the granules in the electric field.
a. Compensated
b. Neutral
c. Neutralized
d. Electroneutral
e. Isoelectric

913. Prosenchyma cells with framed pores in their membranes were detected during microscopy of raw material fragment. Such cells are characteristic of the following tissues:
a. Strengthening tissue
b. Conducting tissue
c. Integumentary tissue
d. Storage tissue
e. Growth tissue

914. A patient was prescribed losartan for treatment of arterial hypertension. What mechanism of action does this drug have?
a. Inhibition of phosphodiesterase
b. Inhibition of angiotensin-converting enzyme
c. Angiotensin-receptor blockade
d. Calcium channel blockade
e. Activation of central alpha-adrenoceptors

915. Laboratories of various specialization use the following method to determine general water hardness of potable water:
a. Acidimetry
b. Complexometric titration
c. Oxidimetry
d. Alkalimetry
e. Precipitation

916. Choose the most efficient way of convallariae glycoside administration for acute cardiac failure treatment:
a. Intravenous
b. Subcutaneous
c. Intramuscular
d. Inhalational
e. Oral

917. Amino acids can participate in a large number of metabolic processes. What amino acid functions as a donor of methyl groups (-CH_3)?
a. Valine
b. Leucine
c. Isoleucine
d. Methionine
e. Tryptophan

918. Sullfur sol was obtained by adding 5 mL of a solution of sulfur in alcohol into 20 mL of distilled water. The sol was obtained by the following method:
a. Chemical condensation
b. Reduction reaction
c. Solvent substitution
d. Hydrolysis reaction
e. Double exchange reaction

919. To isolate a pure culture of the disease's pathogen, its specific biological properties were used: growth at low temperatures, type of respiration, pathogenicity for laboratory animals, growth on selective nutrient media, and the ability for "creeping growth" on the surface of the medium. What microbial culture is expected to be isolated in this case?

a. Pseudomonas aeruginosa
b. Yersinia pestis
c. Enterococcus faecalis
d. Staphylococcus aureus
e. Proteus vulgaris

920. Separation of substances in gas-liquid chromatography occurs due to the different speed of movement of substances through the column. What is the mobile phase in this method of analysis?
a. Liquid phases
b. Organic solvent
c. Water
d. Solid carrier
e. Carrier gas

921. A patient who had been suffering from peptic ulcer disease of the stomach for a long time has cachexia, pallor, weakness, loss of appetite, and aversion to meat products. Biopsy of the gastric mucosa detected cellular anaplasia. What pathology can be characterized by such symptoms?
a. Malignant gastric tumor
b. Ulcer penetration
c. Benign gastric tumor
d. Gastric polyposis
e. Hypertrophic gastritis

922. 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. Alteration
b. Regeneration
c. Sclerosis
d. Exudation
e. Proliferation

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

924. An autoimmune disorder of islet beta-cells was detected in a 14-year-old girl with hyperglycemia, glycosuria, and polyuria. What type of diabetes does this girl have?
a. Type 2 diabetes mellitus
b. Gestational diabetes
c. Type 1 diabetes mellitus
d. Diabetes insipidus
e. -

925. A patient with a small cut on the palm came to the dispensing chemist. What antiseptic would be advisable in this case?
a. Ketoconazole
b. Doxycycline hydrochloride
c. Lidocaine hydrochloride
d. Flemoxin (Amoxicillin)
e. Hydrogen peroxide

926. A patient with tuberculosis has developed impaired hearing after a long-term antibiotic treatment. What drug has caused such an ototoxic effect in this case?
a. Ampicillin
b. Pefloxacin

c. Benzylpenicillin
d. Ceftriaxone
e. Streptomycin

927. A patient with tuberculosis developed impaired hearing after a long-term treatment with an antibiotic. What drug had an ototoxic effect in this case?
a. Ampicillin
b. Streptomycin
c. Abaktal (Pefloxacin)
d. Benzylpenicillin
e. Ceftriaxone

928. 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. Bifidus bacteria
b. Yersinia
c. Staphylococcus aureus
d. Proteus
e. Providencia

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

930. Alimentary hyperglycemia is observed after eating carbohydrate-rich foods. What hepatocyte enzyme activity is induced the most in this case?
a. Isocitrate dehydrogenase
b. Aldolase
c. Glucokinase
d. Phosphorylase
e. Glucose-6-phosphatase

931. Treatment of withdrawal syndrome in cases of morphine discontinuation requires the use of a drug that is an opiate receptor antagonist. Select this drug from the list.
a. Codeine phosphate
b. Naloxone hydrochloride
c. Omnopon
d. Riboflavin
e. Ketorolac

932. One of the important diagnostic features of garden sage and motherwort is their shape of corolla. Their flowers have the following type of corolla:
a. Bilabiate
b. Pseudoligulate
c. Ligulate
d. Thimble-shaped
e. Funnelform

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

934. The following belongs to high-concentration suspensions:
a. Pastes
b. Powders
c. Foams
d. Ointments
e. Creams

935. A woman with type 1 diabetes mellitus developed hyperglycemic coma. Examination revealed metabolic acidosis. This condition developed because of accumulation of the following in the blood:
a. Residual nitrogen
b. Bile acids
c. Ketone bodies
d. Ammonium ions
e. Indirect bilirubin

936. Many organic compounds break up in the cell into simple products. What compounds break up into ammonia, carbon dioxide, and water in the human body?
a. Monosaccharides
b. Monohydric alcohols
c. Amino acids
d. Fatty acids
e. Keto acids

937. You are a hospital pharmacist. Consult the pediatrician, what group of antibiotics is contraindicated for children due to their effect on formation of the bone tissue:
a. Tetracyclines
b. Penicillins
c. Macrolides
d. Aminoglycosides
e. Glucocorticoids

938. Anticholinesterase agents have an effect on neuromuscular transmission and on the tone and motility of the gastrointestinal tract and urinary bladder. What drug is a synthetic representative of this group of drugs?
a. Dipyroxime (Trimedoxime bromide)
b. Physostigmine salicylate
c. Isonitrozine
d. Prozerin (Neostigmine)
e. Galantamine hydrobromide

939. At an altitude of 20000 meters, a depressurization of a cargo plane occurred, followed by its crashing to the ground. A forensic examination determined that the people onboard had died before the impact with the ground. Embolism was stated as one of the causes of death of the entire crew. What type of embolism is most likely in this case?
a. Foreign body embolism
b. Fat embolism
c. Thromboembolism
d. Gas embolism
e. Air embolism

940. It can be safely assumed that the infants born from the mothers with the history of measles will not be affected by the measles outbreak during their stay in the maternity ward. What classes of antibodies provide the infants with the resistance to this disease?
a. IgE
b. IgA
c. IgG
d. IgM
e. IgD

941. Stone cells shaped like dumbbells or tubular bones were detected in begonia leaves. What type of cells do they belong to?
a. Trichosclereids
b. Fibrosclereids
c. Osteosclereids
d. Macrosclereids
e. Astrosclereids

942. In cases of long-term intoxication, a significant decrease in the activity of aminoacyl-tRNA synthetases can be observed. What metabolic process becomes disturbed in such cases?
a. RNA processing
b. DNA replication
c. Biosynthesis of proteins
d. DNA repair
e. Genetic recombination

943. What compound is added along with the murexide indicator to reach pH>12, when detecting calcium cations?
a. Urotropin
b. Sodium hydroxide
c. Ammoniac buffer
d. Ammonium hydroxide
e. Acetate buffer

944. Ultramicroscopy is used to determine the radius of dispersed phase particles. The following should be measured to make the necessary calculations:
a. Intensity of transmitted light
b. Intensity of scattered light
c. Time interval in which a tagged particle travels a certain distance
d. Number of particles in a definite volume
e. Distance traveled by a tagged particle

945. What method is used to destroy an emulsion?
a. Dispersion
b. Homogenization
c. Condensation
d. Centrifugation
e. Emulsification

946. The gradual aging of the body is accompanied by the slowing down of metabolic processes, the appearance of wrinkles, and the literal desiccation of a human body, associated with the cells in muscles and skin losing a certain ability that they have. Name this ability of the cells.
a. Moistening
b. Adhesion
c. Cohesion
d. Swelling
e. Wetting

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

948. A patient has been provisionally diagnosed with diabetes mellitus. What erythrocyte protein needs to be measured in this case to assess the glycemia levels in the patient?

a. gamma-globulin
b. Glycated hemoglobin
c. alpha_2-globulin
d. Bence-Jones protein
e. C-reactive protein

949. What reaction must be conducted by an analytical chemist during the preliminary tests to determine chromium(III) ions?
a. Reaction with ammonia
b. Reaction for formation of a perchromic acid after preliminary oxidation of chromium
c. Reaction with potassium permanganate
d. Reaction with sodium hydroxide
e. Reaction with sodium hydroxide and hydrogen peroxide

950. What reagent is used to detect and photometrically determine Fe(II) and Fe(III) cations?
a. Sulfosalicylic acid
b. Oxalic acid
c. Chloroacetic acid
d. P-aminobenzoic acid
e. Phenylacetic acid

951. A 10-year-old boy ate 0.5 kg of sweets, which exceeds his daily energy needs. As a result, the synthesis of a certain substance will activate in this child. Name this substance.
a. Glycogen
b. Raffinose
c. Sucrose
d. Lactose
e. Starch

952. Isoelectric state of protein molecules depends on the:
a. Mass of the solute
b. pH of the medium
c. Solution preparation technique
d. Shape of the protein molecule
e. Concentration of the solvent

953. Bromatometric determination of streptocide (Sulfanilamide) is performed by means of direct titration with a standard solution of potassium bromate. What is used as an indicator in this method of titration?
a. Murexide
b. Methyl orange
c. Eriochrome black T
d. Iron(III) thiocyanate
e. Phenolphthalein

954. A 13-year-old female patient, having suffered from measles, complains of dry mouth, thirst, body weight loss, polyuria; her glucose concentration in blood is 16 mmol/l. What disease can be suspected?
a. Diabetes insipidus
b. Type I pancreatic diabetes
c. Type II pancreatic diabetes
d. Glycogenosis
e. Steroidogenic diabetes

955. Among NSAIDs, the least damaging effect on the gastrointestinal mucosa is characteristic of:
a. Butadion (Phenylbutazone)
b. Naproxen
c. Diclofenac
d. Acetylsalicylic acid

e. Celecoxib

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

957. What analytical method can be used to quantify hydrogen peroxide without any special indicators?
a. Argentometry
b. Nitritometry
c. Permanganatometry
d. Complexonometry
e. Iodometry

958. Gravimetry was used to analyze sodium sulfate crystalline hydrate by precipitating sulfate ions with a barium chloride solution. After its maturation, the barium sulfate precipitate must be washed using decantation. What is used as a washing liquid for this purpose?
a. Sodium sulfate solution
b. Distilled water
c. Barium chloride solution
d. Ammonium sulfate solution
e. Dilute solution of sulfuric acid

959. Selective solvents are used in laboratories and factories to isolate and refine essential oils, alkaloids, antibiotics, and other pharmaceutical subctances. This process is called:
a. Extraction
b. Coagulation
c. Flocculation
d. Flotation
e. Sedimentation

960. When measuring the antimicrobial activity of drugs, their minimum concentration that suppresses the growth of microbes must be determined. What is this parameter?
a. The lowest drug concentration that inhibits growth of a bacterial test culture
b. The lowest drug concentration that causes development of selective strains of test cultures
c. The lowest drug concentration that has a bactericidal effect
d. The lowest drug concentration that inhibits enzyme biosynthesis in the macroorganism
e. -

961. Ammonium iron(III) sulfate can be used as an indicator in:
a. Acidimetry
b. Complexometric titration
c. Alkalimetry
d. Argentometry, Volhard method
e. Argentometry, Mohr method

962. A narcological department has received a man diagnosed with morphinism. The doctor notes decreased pharmacological activity of morphine. Name the phenomenon, when drug effectiveness is decreased after its repeated administration:
a. Summation
b. Functional cumulation
c. Antagonism
d. Tolerance
e. Material cumulation

963. Flowers with cruciform (cross-shaped) flower-cup and corolla, tetradynamous androecium, pod and silicle seeds are characteristic of the following family:
a. Papaveraceae
b. Rosaceae
c. Ranunculaceae
d. Asteraceae
e. Brassicaceae

964. After accidentally eating inedible mushrooms, a woman presents with disturbed consciousness, anuria, arterial hypotension, and hyperazotemia. What pathological condition can be characterized by these symptoms?
a. Chronic renal failure
b. Urolithiasis
c. Acute diffuse glomerulonephritis
d. Acute renal failure
e. Acute pyelonephritis

965. To quickly stop an attack of angina pectoris, a 55-year-old patient was prescribed an organic nitrate drug. What drug is it?
a. Nifedipine
b. Labetalol
c. Nitroglycerin
d. Octadine (Guanethidine)
e. Prazosin

966. Air contamination with pathological microorganisms can be determined by the presence of indicator bacteria. Specify the bacteria that indicate immediate epidemiologic danger:
a. Mold fungi
b. Sarcinae
c. Micrococci
d. Yeast fungi
e. Hemolytic streptococci

967. Blood contains erythrocytes with sizes of 10^-6 m degree as its constituent parts. What type of disperse system is blood?
a. Homogeneous
b. Colloidal dispersion
c. Coarse dispersion
d. Heterogeneous
e. Microheterogeneous

968. There are plants selected, that have tubular, ligulate, pseudoligulate and funnelform flowers, clustered in simple flowerheads. These plants belong to the following family:
a. Solanaceae
b. Valerianaceae
c. Tiliaceae
d. Asteraceae (Compositae)
e. Ericaceae

969. Solutions of high-molecular compounds can be precipitated by concentrated electrolyte solutions. Name this process:
a. Coacervation
b. Coagulation
c. Salting-out
d. Peptization
e. Syneresis

970. What heterocycle has acidophobic properties?
a. Pteridine

b. Pyrrole
c. Pyrimidine
d. Thiophene
e. Quinoline

971. Corolla of a zygomorphic monoecious flower consists of 5 petals, the biggest is "banner", two lateral are "wings", and the last two are fused together to form "keel". Name the described corolla that is characteristic of medicinal plants of the Fabaceae family.
a. Funnelform
b. Tubular
c. Papilionaceous
d. Ligulate
e. Saucer-shaped

972. In hot weather on the leaf tips of Tilia cordata and on the crenations along its leaf edges, drops of liquid are released through the water stomata. Name the structures located on the plant leaves, through which liquid water can be passively released:
a. Hydropotes
b. Nectaries
c. Osmophores
d. Hydatodes
e. Glandules

973. Explain to a pharmacy student, why group III anions have no group reagent:
a. They belong to toxic elements
b. They have large ionic radii
c. They have close ionic radii
d. They form water-soluble salts with most cations
e. They can form soluble acids

974. On a fusiblity curve of a two-component system with simple eutectic we can observe the following above the liquidus line:
a. One component is liquid, another is solid
b. Each component is partially in different aggregate states
c. Both components are in solid state
d. Both components are in gaseous state
e. Both components are in liquid state

975. Decarboxylation of histidine amino acid leads to formation of histamine in the cells. What enzyme ensures neutralization of this biogenic amine?
a. Catalase
b. Aminopeptidase
c. Monoamine oxidase (MAO)
d. Aminotransferase
e. Diamine oxidase (DAO)

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

977. 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. Chloroform

b. Camphor
c. Benzene
d. Acetic acid
e. Water

978. 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. Synthetases
b. Oxidoreductases
c. Transferases
d. Hydrolases
e. Isomerases

979. Oxidation of carbohydrates, amino acids, and fatty acids generally occurs via tricarboxylic acid cycle. Specify the acid with which acetyl-CoA reacts first in the tricarboxylic acid cycle:
a. Citric
b. Isocitric
c. Oxaloacetic
d. Fumaric
e. Malic

980. To determine the end point of an acid-base titration the following indicators are used:
a. pH-indicators
b. Redox indicators
c. Metal indicators
d. Adsorption indicators
e. Luminescent indicators

981. On day 7 of dimedrol (diphenhydramine) treatment, the patient noted a decrease in the effectiveness of the drug. What pharmacological concept describes the decreased response of the body to a drug?
a. Idiosyncrasy
b. Carcinogenicity
c. Mutagenicity
d. Embryotoxicity
e. Tolerance

982. An analytical chemist conducts qualitative analysis of IV group cations. What reagent can be used to determine zinc?
a. Alizarin
b. Murexide
c. Diphenylamine
d. Thiourea
e. Dithizone

983. The cells of Brassica oleracea leaves contain a certain vitamin that facilitates healing of gastric and duodenal ulcers. It is vitamin:
a. E
b. U
c. K
d. A
e. C

984. What pair of electrodes is used in potentiometric redox titration?
a. Silver electrode and platinum electrode
b. Glass electrode and silver chloride electrode
c. Silver sulfide electrode and silver chloride electrode
d. Platinum electrode and silver chloride electrode

e. Copper electrode and zinc electrode

985. A solution contains iodide and chloride ions. Choose the reagent to detect iodide ions:
a. Limewater
b. Chlorine water
c. Gypsum water
d. Hydrogen sulfide water
e. Barium water

986. What parameter determines the coagulating power of an electrolyte?
a. Sol volume
b. Sol density
c. Charge of the coagulator ion
d. Electrolyte concentration
e. Sol dispersion degree

987. Metallochromic indicators are used in complexometric titration, when determining total water hardness. For this purpose, the following can be used as an indicator:
a. Potassium chromate
b. Eriochrome black T
c. Methyl red
d. Fluorescein
e. Phenolphthalein

988. What type of solutions can be used as infusion solutions?
a. Isotonic
b. Hypotonic
c. Hypertonic
d. Ideal
e. Colloid

989. Extreme therapeutic effect of activated carbon is due to its high specific surface area. Name the phenomenon when gases are absorbed only by the surface of a solid body:
a. Adsorption
b. Adhesion
c. Cohesion
d. Recuperation
e. Desorption

990. Corolla of a zygomorphic bisexual flower consists of 5 petals: the largest one is called a banner, two lateral - wings, and two fused together - keel. This corolla is characteristic of Fabacea family and is called:
a. Papilionaceous
b. Funnelform
c. Lingulate
d. Rotate
e. Tubular

991. A chemist-analyst must determine the quantitative content of hydrochloric acid in a mixture that contains nitric acid. What titrimetric method of analysis can be used for this purpose?
a. Argentometry
b. Complexonometry
c. Iodometry
d. Acid-base titration
e. Permanganatometry

992. Microscopy of a leaf of a heliophyte plant detects several dense layers of elongated chlorophyll-containing cells that are located under the epidermis. These cells are oriented perpendicular to the surface of the leaf. What type of parenchyma is it?

a. Spongy parenchyma
b. Palisade parenchyma
c. Water-storage parenchyma
d. Folded parenchyma
e. Storage parenchyma

993. In the dentist's office, a patient developed asphyxia caused by aspiration of a small instrument. What type of respiratory failure is observed in this case?
a. Diffusion
b. Dysregulatory
c. Perfusion
d. Obstructive
e. Restrictive

994. Iodimetry involves use of standard solutions of iodine and Na_2S_2O_3. What substance is used to standardize the sodium thiosulfate solution?
a. N_2B_4O_7
b. NaCl
c. K_2Cr_2O_7
d. K_2CO_3
e. As_2O_3

995. A diagnostic features of which family is the presence of giants or a flower tube?
a. Heather
b. Rose
c. Solanaceae
d. Celery
e. Beech trees

996. In pharmaceutical production the oxyethylated derivatives of fatty acid esters (FAEs) are used, which undergo colloid dissolution in sufficiently concentrated solutions. This process is called:
a. Syneresis
b. Colloid protection
c. Synergism
d. Solubilization
e. Sensitization

997. During a practical session in pharmaceutical botany, the students were studying herbarium specimens of Asteraceae family plants. What plant of this family has flowers that are all yellow, zygomorphic, ligulate, and bisexual?
a. Centaurea cyanus
b. Echinacea purpurea
c. Bidens tripartita
d. Taraxacum officialis
e. Achillea millefolium

998. The Wasserman test was positive in a 25-year-old woman. What disease can be diagnosed using this test?
a. Tuberculosis
b. Diphtheria
c. Leptospirosis
d. Brucellosis
e. Syphilis

999. What medium is necessary for determining the halide ions argentometrically using the Volhard method?
a. Neutral medium
b. Strong alkaline medium
c. Weak alkaline medium

d. Nitric acid medium
e. Acetic acid medium

1000. Specify the substance that results from the following reaction: CH equiv CHxrightarrow HOH, medspace Hg^2+ ?
a. Propanal
b. Ethanol
c. Propanone
d. Ethanal
e. Acetic acid

1001. Enzyme activity is measured to diagnose diseases of the pancreas. What enzyme must be used in acute pancreatitis?
a. Aldolase
b. Deoxyribonuclease
c. Ribonuclease
d. Alanine aminotransferase
e. Amylase

1002. A specimen of Rosa majalis fruit was added to the morphological collection. This fruit consists of nutlets embedded in a matrix of fine stiff hairs on the inner surface of the succulent hypanthium. Name this fruit:
a. Pepo
b. Cremocarp
c. Coenobium
d. Cynarrhodium
e. Hesperidium

1003. A pathological process in the blood serum has caused increased ammonia levels. What is the main way of toxic ammonia neutralization?
a. Alanine synthesis
b. Ammonium salt synthesis
c. Glycine synthesis
d. Urea synthesis
e. Uric acid synthesis

1004. Polarography is one of the electrochemical methods of analysis. What parameter is used in polarographic analysis to identify the substance being analyzed?
a. Width of a polarographic wave
b. Height of a polarographic wave
c. Half-wave potential
d. Position of a polarographic wave
e. Magnitude of the electromotive force

1005. Coagulation of hydrophobic sols occurs after a certain amount of electrolyte is added. How do we call the minimal concentration of electrolyte that induces colloid solution coagulation?
a. Concentration
b. Condensation
c. Neutralization
d. Coagulation threshold
e. Coagulation ability

1006. A solution being analyzed contains ammonium and sodium cations. What reagent can detect sodium cations in this solution?
a. Potassium oxalate
b. Uranyl zinc acetate
c. Potassium benzoate
d. Potassium hydrotartrate
e. Potassium tetraiodomercurate(II)

1007. If there is no strophanthin in the pharmacy stock, the following cardiac glycoside can be used as its substitute:
a. Digitoxin
b. -
c. Izolanid (Lanatoside C)
d. Adonisid (Adonis vernalis glycosides)
e. Corglycon (Convallatoxin)

1008. Which of the drugs listed below quickly arrests angina pectoris attack when taken sublingually?
a. Amiodarone
b. Nitroglycerine
c. Convallariae glycoside
d. Digoxin
e. Lisinopril

1009. 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. Lactose
b. Fructose
c. Sucrose
d. Maltose
e. Glucose

1010. When studying five herbarium specimens of medicinal plants, it was determined that one of them belongs to Fabaceae family. Which one is it?
a. Hyoscyamus niger
b. Datura stramonium
c. Ononis arvensis
d. Atropa belladonna
e. Solanum dulcamara

1011. Suppositories are widely used in medicine. What requirement should their aggregative stability meet?
a. Must be solid
b. Must not disintegrate
c. Must not dissolve
d. Melting point of 37^oC
e. Must be non-volatile

1012. 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. Acetate buffer solution
c. Formate buffer solution
d. Acidic solution
e. Ammonium buffer solution

1013. What drug is administered in case of uterine inertia?
a. Fenoterol
b. No-spa
c. Vikasolum
d. Oxytocin
e. Progesterone

1014. Explain to a young physician, how to prevent withdrawal syndrome in a patient after completion of glucocorticoid therapy:
a. Immunostimulating therapy
b. Vitamin preparations

c. Antidotal therapy
d. CNS stimulants
e. Gradual decrease of the dose

1015. A patient complains of maldigestion of nutrients and intestinal bloating. The doctor suspects acute pancreatitis and has ordered a diastase (alpha-amylase) activity test to confirm this diagnosis. Activity of this enzyme can be measured based on the breakdown of:
a. Albumin
b. Cellulose
c. Starch
d. Collagen
e. Chitin

1016. Common nettle, hop, black elderberry relate to the plants that require soils rich in nitrogen compounds, that is, such plants are called:
a. Nitrophytes
b. Calciphobes
c. Halophytes
d. Nitrophobes
e. Calciphiles

1017. Direct complexometric titration is used to determine the concentration of:
a. Hydroxide ions
b. Hydrogen ions
c. Strong acid anions
d. Weak acid anions
e. Metal cations

1018. A patient has toxic pulmonary edema. What drug must be used for emergency aid in this case?
a. Mannitol
b. Indapamide
c. Spironolactone
d. Diacarb (Acetazolamide)
e. Hydrochlorothiazide

1019. The synthesis of thyroid hormones is carried out from tyrosine within a special protein of the thyroid gland. Name this protein.
a. Histone
b. Albumin
c. Thyroglobulin
d. Immunoglobulin
e. Interferon

1020. Natural peptides can carry out various functions. What bioactive peptide is a major antioxidant and functions as a coenzyme?
a. Bradykinin
b. Glutathione
c. Anserine
d. Liberin
e. Oxytocin

1021. Oxygen cocktails are used in treatment of upper air passages. What kind of colloid system is it?
a. Powder
b. Suspension
c. Emulsion
d. Paste
e. Aerosol

1022. What plant is a component of the pectoral herbal tea and has characteristic basal

long-petiolate, broadly ovate leaves that are white and downy from below and dark green, bare, and glossy from above?
a. Thymus serpillum
b. Origanum vulgare
c. Tussilago farfara
d. Sambucus nigra
e. Verbascum phlomoides

1023. A 47-year-old patient with bilateral pneumonia has a disruption of acid-base balance - compensated gaseous acidosis. What is the most probable mechanism of compensatory adaptation that maintains the patient's acid-base balance?
a. Diarrhea
b. Intensified acidogenesis in kidneys
c. Pulmonary hyperventilation
d. Decreased reabsorption of hydrogen carbonate in kidneys
e. Vomiting

1024. A man came to a doctor complaining of a severe joint pain. Urinalysis shows increased levels of uric acid, which indicates:
a. Increased glycolysis activity
b. Increased activity of fatty acid beta- oxidation
c. Increased synthesis of ketone bodies
d. Intensive breakdown of purine nucleotides
e. Increased glycogenolysis activity

1025. What group of diuretics completely rules out simultaneous prescription of hypotensive drugs that are ingibitors of angiotensin converting enzyme?
a. Thiazide
b. Xanthine
c. Loop
d. Potassium-sparing
e. Osmotic

1026. Hemoglobin breakdown begins in the cells of reticuloendothelial system. What enzyme catalyzes the reduction reaction of biliverdine into bilirubin?
a. Heme oxygenase
b. Xanthine oxidase
c. Hexokinase
d. beta-glucuronidase
e. Biliverdine reductase

1027. A child diagnosed with rheumatism was hospitalized. What microorganisms cause this disease?
a. Enterococci
b. Streptococci
c. Staphylococci
d. Meningococci
e. Pneumococci

1028. A patient has marked allergic symptoms: rashes on the body, facial edema, itching. This condition is associated with an increase in formation of a certain biogenic amine. Name this biogenic amine.
a. Cadaverine
b. Putrescine
c. GABA
d. Indican
e. Histamine

1029. Against the background of cardiac glycoside treatment, a person developed an arrhythmia. The doctor prescribed the patient a potassium medicine that successfully normalized the heart rate. Name

this potassium medicine.
a. Metoprolol
b. Asparcam
c. Novocainamide
d. Verapamil
e. Amiodarone

1030. Gravimetric titration was used to determine aluminium mass fraction in a medicinal preparation. Ammonium hydroxide solution was used as a precipitant. In this case the gravimetric form will be:
a. Ammonium nitrate
b. Aluminium hydroxide
c. Aluminium oxide
d. Aluminium carbonate
e. Ammonium chloride

1031. What antihistamine with marked sedative effect should be prescribed to be taken before bed?
a. Fexofenadine
b. Guttalax (Sodium picosulfate)
c. Dimedrol (Diphenhydramin)
d. Loratadine
e. Aerius (Desloratadine)

1032. Jellies and the process of jellification are of great importance in medicine and biology. Name the process of jelly destruction followed by the restoration of its jellified state:
a. Syneresis
b. Coagulation
c. Salting-out
d. Thixotropy
e. Coacervation

1033. A 62-year-old man was hospitalized into the cardiology department in a severe condition with the diagnosis of acute myocardial infarction in the posterior wall of the left ventricle and septum, pulmonary edema. What is the primary mechanism of pulmonary edema development in this patient?
a. Decreased alveolocapillary oxygen diffusion
b. Pulmonary venous hypertension
c. Hypoxemia
d. Acute left ventricular failure
e. Pulmonary arterial hypertension

1034. At the beginning of the bacteriological study, microscopy of the studied material was carried out and Gram-positive cocci were detected in it. The cocci were arranged in the clusters that resembled a bunch of grapes. Next, the material was inoculated on a dense nutrient medium. Why was it done?
a. To obtain the pure culture
b. To study the biochemical properties
c. To study the cultural properties
d. To study the antigenic properties
e. To obtain isolated colonies

1035. The following method can be used to quantitatively determine magnesium sulfate in the solution:
a. Nitrite titration
b. Argentometry
c. Thiocyanate titration
d. Acidimetry
e. Complexometric titration

1036. Blood test of a patient, who had been taking non-steroidal anti-inflammatory drugs for a long

time, detected a sharp decrease in the amount of neutrophilic granulocytes, basophils, and eosinophils against the background of leukopenia. What pathological condition has developed in the patient?
a. Anemia
b. Leukocytosis
c. Agranulocytosis
d. Aleukia
e. Leukemia

1037. A specialist of the analytical laboratory performs direct iodometric determination of ascorbic acid. What indicator is used in this case?
a. Phenolphthalein
b. Methyl orange
c. Diphenylamine
d. Starch
e. Methyl red

1038. Some hormones are synthesized from amino acids in the body. What amino acid is the precursor to the thyroxine hormone?
a. Glutamine
b. Histidine
c. Arginine
d. Tyrosine
e. Cysteine

1039. Name the process of cell membrane saturation with a fat-like substance - suberin:
a. Cutinization
b. Lignification
c. Suberization
d. Mucification
e. Mineralization

1040. Potentiometry is an analytical method widely used in pharmaceutical analysis. In what galvanic cell its electromotive force (EMF) does not depend on the value of standard electrode potentials?
a. Reversible galvanic cell
b. Galvanic cell with ionic transport
c. Concentration galvanic cell
d. Chemical galvanic cell
e. Galvanic cell without ionic transport

1041. A fruit tree of Rosaceae family has short thorny shoots; the fruit is a distinctively-shaped pome with stone cells in its pulp. Name this plant:
a. Prunus spinosa
b. Cerasus vulgaris
c. Malus sylvestris
d. Prunus armeniaca
e. Pyrus communis

1042. A patient with essential hypertension has elevated plasma renin levels. What pharmacological group of medicines is preferable in the treatment of this patient?
a. Alpha-blockers
b. Calcium ion antagonists
c. Sympatholytics
d. Diuretics
e. ACE inhibitors

1043. Serum total protein is one of metabolic indicators. What reaction is usually used in clinical laboratories to measure this value?
a. Ninhydrin

b. Xanthoproteic
c. Fohl
d. Nitroprusside
e. Biuret

1044. A patient complains of a girdling epigastric pain. Examination reveals increased diastase levels in the patient's urine and undigested fat in the stool. These signs are the most characteristic of the following pathology:
a. Acute pancreatitis
b. Infectious hepatitis
c. Acute appendicitis
d. Gastritis
e. Enterocolitis

1045. A man with signs of glomerulonephritis came to a hospital. What pathological components in his urine indicate the increased permeability of the glomerular membrane?
a. Pus
b. Glucose
c. Bilirubin
d. Acetone
e. Protein

1046. Phenobarbital causes induction of smooth endoplasmic reticulum enzymes in the cells. As a result, the amount of active pharmaceutical ingredient decreases due to the following process:
a. Activation of microsomal oxidation
b. Activation of lipid peroxidation
c. Activation of uric acid synthesis
d. Activation of glycolysis
e. Activation of protein peroxidation

1047. IgM to rubella virus were detected in the blood serum of a sick child. What stage of the disease progression is indicated by this sign?
a. Incubation
b. Post-vaccination
c. Chronic
d. Persistent
e. Acute

1048. During furosemide therapy of a patient with chronic edematous syndrome, his plasma-cation concentration was disturbed. What drug should be used in this case?
a. Ascorutin (Ascorbic acid + Rutoside)
b. Thiamine bromide
c. Aspirin
d. Magne B_6
e. Potassium chloride

1049. A patient has been hospitalized with signs of ascites. The doctor prescribed the patient spironolactone to enhance the diuretic effect of hydrochlorothiazide. What effect does this drug have apart from the diuretic effect?
a. Potassium-sparing
b. Analgesic
c. Antispasmodic
d. Irritant
e. Sedative

1050. Electrokinetic potential is a parameter that measures the charge of proteins, leukocytes, and erythrocytes. At what interface is the electrokinetic potential generated?
a. Core-adsorption layer
b. Core-diffuse layer

c. Micelle-dispersion medium
d. Granule-diffuse layer
e. Aggregate-potential-determining ions

1051. A patient has developed an allergic skin reaction in the form of urticaria after using an antibiotic to treat pneumonia. What antihistamine is indicated in this case?
a. Tannin
b. Prednisolone
c. Ranitidine
d. Loratadine
e. Raunatine (Rauwolfia alkaloids)

1052. A patient with bronchitis was taking doxycycline hydrochloride. What side effects can develop in the patient after the patient has been taking this drug for some time?
a. Hypertension, arrhythmia
b. Withdrawal, dependence
c. Diarrhea, hepatitis
d. Euphoria, tolerance
e. Hypotension, vertigo

1053. What antifungal antibiotic is poorly absorbed in the gastrointestinal tract and is effective against intestinal candidiasis?
a. Griseofulvin
b. Nystatin
c. Ketoconazole
d. Terbinafine
e. Fluconazole

1054. A person was hospitalized into the infectious department with the body temperature of 39^oC, headache, and chills. Spiral-shaped microorganisms stained violet according to the Romanowsky-Giemsa technique were detected in the thick blood smear. What microorganisms were detected in the patient?
a. Borrelia
b. Leptospira
c. Treponema
d. Clostridia
e. Actinomycetes

1055. Heating of sodium phenolate in CO_2 stream results in production of a certain carboxylic acid. Name the resulting compound:
a. Salicylic acid
b. Ethyl salicylate
c. Benzoic acid
d. Aminophenol
e. Phenyl salicylate

1056. What is the type of leaf attachment to the stem in Papaver somniferum?
a. Clasping
b. Perfoliate
c. Ochreate
d. Auriculate
e. Sheathing

1057. A patient with a hypertensive crisis was administered magnesium sulfate, which resulted in a sharp drop of the patient's blood pressure. What drug can be used in this case to eliminate the side effects of magnesium sulfate?
a. Sodium sulfate
b. Sodium bromide
c. Potassium chloride

d. Calcium chloride
e. Trilon B (EDTA disodium salt)

1058. The Embryophyta subkingdom (higher plants) includes mainly terrestrial organisms, represented by various life forms (grasses, shrubs, subshrubs, trees, etc.). What division of higher plants includes only shrubs and trees?
a. Polypodiophyta
b. Magnoliophyta
c. Lycopodiophyta
d. Bryophyta
e. Pynophyta

1059. 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 as the result?
a. Insulin
b. Glucagon
c. Aldosterone
d. Testosterone
e. Estradiol

1060. Calcium carbonate crystals are deposited as clusters on the inner protrusions of a cell wall. What are these formations called?
a. Druses
b. Druses attached to cell membrane
c. Raphides
d. Styloids
e. Cystoliths

1061. Catalysts are widely used in production of drugs. How can reaction acceleration in the presence of a catalyst be explained?
a. Total collision frequency increases
b. Collision frequency decreases
c. Activation energy decreases
d. Activation energy increases
e. Molecule speed increases

1062. A certain part of the primary structure of a root has cells with Casparian strips, impregnated with suberin. What tissue of the primary structure of a root contains these cells?
a. Epiblem
b. Mesodermis
c. Endodermis
d. Pericycle
e. Exodermis

1063. What cation is present in the solution, if its heating with an alkali produces a gas with pungent odor?
a. Lead(II)
b. Mercury(I)
c. Mercury(II)
d. Ammonium
e. Silver(I)

1064. Formation enthalpy equals zero for the following substance:
a. O_2
b. H_2O_2
c. H_2SO_4
d. $CaCO_3$
e. CO_2

1065. A patient with neurosis suffers from fear and emotional tension. To relieve these symptoms a doctor prescribed the following drug:
a. Lithium carbonate
b. Diazepam
c. Sydnocarb (Mesocarb)
d. Nootropil (Pyracetam)
e. Caffeine

1066. In the process of silver cations identification reaction HCl and then ammonia solution have been added to the solution. What compound has been produced as a result?
a. [Ag_2(NH_3)_3]Cl
b. AgCl
c. [Ag(NH_3)_3]Cl
d. [Ag(NH_3)_2]Cl
e. AgOH

1067. Name the structural unit of a colloidal solution of a medicinal substance:
a. Molecule
b. Atom
c. Micelle
d. Ion
e. Zwitterion

1068. Transverse section of an axial organ has revealed conductive bundle with phloem and xylem radiating in separate alternate areas. Name the organ and type of conductive bundle:
a. Bundle is radial, organ is root of primary structure
b. Bundle is collateral closed, organ is monocotyledon stem
c. Bundle is collateral open, organ is dicotyledon stem
d. Bundle is amphicribal (hadro centric), organ is fern rhizome
e. Bundle is amphivasal (lepto centric), organ is monocotyledon rhizome

1069. A perennial herbaceous plant has the following characteristic features: calyx with an epicalyx, double perianth, fused stamens with purple anthers, its fruit is a disc-like schizocarp. Name this plant.
a. Althaea officinalis
b. Melissa officinalis
c. Polygonum persicaria
d. Amygdalus communis
e. Hyoscyamus niger

1070. Entropy, as one of the main thermodynamic functions, is a measure of:
a. Internal energy of a system
b. Enthalpy
c. Energy that can be used to perform work
d. Total energy of a system
e. Dissipated energy

1071. A 60-year-old man has depressive syndrome and glaucoma. Why is antidepressant amitriptyline contraindicated in this case?
a. It acts as a muscarinic antagonist
b. It acts as an alpha-blocker
c. It is contraindicated for elderly patients
d. It increases blood pressure
e. It acts as a muscarinic agonist

1072. Primary and secondary nitroalkanes are tautomeric compounds. What tautomerism is characteristic of these compounds?
a. Amino-imino tautomerism
b. Aci-nitro tautomerism
c. Keto-enol tautomerism

d. Lactam-lactim tautomerism
e. Tautomerism of azoles

1073. Coumarins, vitamin K antagonists, suppress the processes of blood coagulation. What protein synthesis is blocked by coumarins?
a. Ceruloplasmin
b. Albumin
c. Transferrin
d. Prothrombin
e. Gamma globulin

1074. A patient developed a keloid scar at the site of skin inflammation. This condition is associated with an abnormal course of a certain stage of inflammation. Name this stage.
a. Exudation
b. Primary alteration
c. Secondary alteration
d. Proliferation
e. Progression

1075. A certain meristematic tissue is located in the vascular bundles of the stem between the secondary phloem and the secondary xylem. What type of meristematic tissue is it?
a. Pericycle
b. Phellogen
c. Cambium
d. Procambium
e. Dermatogen

1076. Heparin is a direct-acting anticoagulant that decreases blood clotting and prevents formation of the thrombus. This substance activity is based on the phenomenon of:
a. Micelle formation
b. Syneresis
c. Thixotropy
d. ''Colloidal protection''
e. Dialysis

1077. During long-term carbon tetrachloride poisoning of animals significant activity drop of aminoacyl tRNA synthetase in hepatocytes was detected. What metabolic process is disrupted in this case?
a. Protein biosynthesis
b. RNA transcription
c. DNA replication
d. Post-transcriptional modification of RNA
e. Post-translational modification of peptides

1078. Neutralization of xenobiotics and active endogenous metabolites often occurs via inclusion of an oxygen atom into a substrate molecule as the result of the following process:
a. Hydroxylation
b. Deaminization
c. Phosphorilation
d. Decarboxylation
e. Transamination

1079. The third analitycal group of cations (acid-base classification) includes Ca^2+, Sr^2+, Ba^2+. What acid can function as a precipitator agent (group reagent) for these cations?
a. CH_3COOH
b. HNO_3
c. HCl
d. H_2SO_4
e. HClO_4

1080. Name the process of liquid droplets or gas (air) bubbles fusion that occurs when they collide inside a moving medium (liquid, gas), or on the surface of a body:
a. Sedimentation
b. Electrophoresis
c. Coalescence
d. Aggregation
e. Coagulation

1081. Certain amino acids decarboxylate in large intestine producing toxic substances. What compound is produced from ornithine?
a. Putrescine
b. Phenol
c. Indole
d. Lysine
e. Arginine

1082. A woman with candidomycosis was prescribed a drug that is used in cases of fungal pathology of any localization and can cause diarrhea and toxic liver damage. What drug did the doctor prescribe in this case?
a. Bicillin-5
b. Chingamine (Chloroquine)
c. Mebendazole
d. Fluconazole
e. Amoxicillin

1083. A patient, who was prescribed famotidine to treat peptic ulcer disease, came to the pharmacy. What is this drug's mechanism of action?
a. Inhibition of hydrogen potassium ATPase
b. H1-histamine receptor blockade
c. Muscarinic receptor blockade
d. Ganglionic receptor blockade
e. H2-histamine receptor blockade

1084. On the teeth of a leaf blade, water droplets are excreted through a constantly open gap between two guard cells of the epidermis. This structure is a:
a. Hydathode
b. Glandular hair
c. Osmophor
d. Sticky hair
e. Nectary

1085. In dental practice liquid dosage forms that contain camphor and chloralhydrate are used. What phases are in equilibrium in the eutectic point of fusiblity curve of the camphor-chloralhydrate mixture?
a. Eutectic melt, camphor crystals, chloralhydrate crystals
b. Eutectic melt
c. Eutectic melt, chloralhydrate crystals
d. Eutectic melt, camphor crystals
e. Camphor crystals, chloralhydrate crystals

1086. A 40-year-old woman has been suffering from menorrhagia for a long time. Blood test: Hb- 90 g/L, erythrocytes - 3.9cdot10^12/L, color index - 0.69. What is the main cause of hypochromic anemia development in this case?
a. Increased iron consumption
b. Iron loss due to bleeding
c. Insufficient iron intake with food
d. Non-absorption of iron in the body
e. Vitamin B_12 deficiency

1087. In pine wood, essential oils accumulate in the passages that inside are lined with a layer of secretory cells. Name these structures:
a. Glandules
b. Lysigenous cavities
c. Schizogenous cavities
d. Non-articulated laticifers
e. Articulated laticifers

1088. To determine the species of disease agent it is necessary to study its destructive enzymes. What enzyme of those listed below is one of them?
a. Catalase
b. Peroxidase
c. Hydrolase
d. Hyaluronidase
e. Isomerase

1089. Long-term use of antibiotics can result in development of dysbiosis. What method can detect intestinal dysbiosis?
a. Allergy testing
b. Patient interview
c. Serology
d. Bacteriology
e. Gnotobiotic experiments

1090. In medical and pharmaceutical practice the phenomena of adsorption, wetting, and adhesion are regularly observed. Name this group of phenomena:
a. Physico-chemical phenomena
b. Molecular-kinetic phenomena
c. Electrokinetic phenomena
d. Optical phenomena
e. Surface phenomena

1091. A person suffers from a chronic inflammatory process. In the focus of the inflammation, a certain biochemical process maintains the concentration of NADPH that is necessary for the phagocytosis mechanism to occur. What process is it?
a. Ornithine cycle
b. Glycolysis
c. Cori cycle
d. Pentose phosphate pathway
e. Uric acid synthesis

1092. Metal ions in the blood are transported in a complex with proteins. What blood protein contains copper?
a. Ceruloplasmin
b. Fibrinolysin
c. Fibrinogen
d. Thrombin
e. Albumin

1093. The children attending a kindergarten were hospitalized with diagnosis of poliomyelitis. What was the route of infection transmission in this case?
a. Fecal-oral transmission
b. Direct contact transmission
c. Alimentary transmission
d. Vector-borne transmission
e. Transmission via airborne dust particles

1094. What coordinates are used to build monomolecular adsorption isotherms?
a. Inverse adsorption - concentration

b. Logarithm of adsorption - concentration
c. Inverse adsorption - inverse concentration
d. Surface tension - concentration
e. Adsorption - concentration

1095. A 25-year-old man has an appointment with the dentist. Several minutes after his oral cavity was lavaged with furacilin (nitrofurazone) the patient developed significant labial edema. What type of allergic reaction is observed in this case?
a. Anaphylactic
b. Immune complex
c. Delayed-type hypersensitivity
d. Stimulated
e. Cytolytic

1096. What titrimetric method of analysis is used for the quantification of calcium chloride?
a. Cerimetry, direct titration
b. Permanganatometry, back titration
c. Nitritometry, direct titration
d. Acidimetry, back titration
e. Permanganatometry, direct titration

1097. What thermodynamic parameter does not allow measuring its absolute value?
a. Heat capacity
b. Work
c. Thermal effect
d. Internal energy
e. Heat

1098. 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. Ba^2+
b. Pb^2+
c. Ag^+
d. Ca^2+
e. Hg^2+

1099. What cations of the fifth analytical group (acid-base classification) form colored hydroxides when precipitated with a group reagent?
a. Ca^2+, Ba^2+
b. Ag^+, Al^3+
c. Na^+, K^+
d. Sn^2+, Sr^2+
e. Fe^2+, Fe^3+

1100. Select from the list a compound that is a pyridinecarboxylic acid:
a. Benzoic acid
b. Nicotinic acid
c. Barbituric acid
d. Malic acid
e. Uric acid

1101. Fatty degeneration of liver is prevented by lipotropic substances. Which of the following substances belongs to them?
a. Cholesterol
b. Glucose
c. Bilirubin
d. Methionine
e. Glycine

1102. A 77-year-old man complains of shortness of breath, leg edemas, and cardiac pain. He suffers from chronic heart failure. What type of hypoxia is observed in this man?
a. Tissue hypoxia
b. Respiratory hypoxia
c. Hypoxic hypoxia
d. Blood hypoxia
e. Circulatory hypoxia

1103. The products of condensation of aldehydes with hydroxylamine belong to the following class:
a. Hemiacetals
b. Ketoximes
c. Hydrazones
d. Hydrazides
e. Aldoximes

1104. What disperse system can be classified as liquid-liquid based on its aggregate state?
a. Activated carbon
b. Lather
c. Fog
d. Smoke
e. Milk

1105. A woman has chronic heart failure with edema syndrome. Increased aldosterone levels were detected in her blood. What diuretic must be prescribed in this case?
a. Theophylline
b. Asparcam
c. Spironolactone
d. Paracetamol
e. Furosemide

1106. A bulbous plant with specific odor has basal leaf arrangement; the leaves are cylindrical and fistulose. Its peduncle bears a simple umbel inflorescence with membranous indusium. Its fruit is a capsule. These features of the plant indicate that it belongs to the following species:
a. Allium sativum
b. Allium cepa
c. Agropyron repens
d. Acorus calamus
e. Convallaria majalis

1107. What is the main substrate for eicosanoid synthesis in the human body?
a. Oleic acid
b. Arachidonic acid
c. Palmitic acid
d. Caproic acid
e. Stearic acid

1108. To stimulate birth activity, a certain neurohypophyseal hormone is used. Name this hormone:
a. Insulin
b. Thyroxine
c. Glucagon
d. Testosterone
e. Oxytocin

1109. For a humoral immune response to form, a number of cells of the immune system must interact with the antigen. What cells are the first to encounter the antigen?
a. Macrophages
b. NK cells
c. B lymphocytes
d. Suppressor T cells

e. Helper T cells

1110. Asepsis, antiseptics, disinfection, and sterilization are widely used in pharmaceutical practice. What is the correct definition of the term "asepsis"?

a. Preventing microbes from contaminating any object

b. Destruction of pathogenic microbes in the environment

c. The use of substances that kill microorganisms on the skin and mucosa

d. The use of substances that kill pathogenic microbes in the internal environment of the body

e. Complete destruction of all forms of microbes in an object

1111. A patient complains of low body temperature, weight gain, inertness, and drowsiness. T4 and T3 levels are decreased in his blood plasma. These signs are characteristic of the following pathology:

a. Diabetes mellitus

b. Albinism

c. Phenylketonuria

d. Myxedema

e. Pellagra

1112. When an isolated system spontaneously approaches its equilibrium, its entropy:

a. Approaches infinity

b. Reaches maximum

c. Demonstrates linear magnification

d. Approaches zero

e. Reaches minimum

1113. To treat peptic ulcer disease of the stomach, the patient was prescribed an H_2-receptor antagonist under the brand name of Quamatel. What can be used as a substitute, if this brand is not available in the pharmacy?

a. De-Nol (Bismuth subnitrate)

b. Pirenzepine

c. Omeprazole

d. Pantoprazole

e. Famotidine

1114. 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 (fifth power)

c. Incident light (fourth power)

d. Incident light (third power)

e. Incident light

1115. Conducting tissue cells are live and connected to the sieve tube elements. It is characteristic of:

a. Collenchyma

b. Tracheids

c. Companion cells

d. Vessels

e. Sclerenchyma

1116. Ion-exchange adsorption is widely used for water softening and demineralization. Through what ionite columns should the water be passed for its demineralization?

a. Through the anionite in the ROH-form, and then through the cationite in the R2Ca-form

b. Through the cationite in the RK-form, and then through the anionite in the ROH-form

c. Through the anionite in the R2SO4-form, and then through the cationite in the ROH-form

d. Through the cationite in the RH-form, and then through the cationite in the RK-form

e. Through the cationite in the RH-form, and then through the anionite in the ROH-form

1117. Amino acids and their derivatives function as neurotransmitters in brain neurons. What neurotransmitter forms from an aromatic amino acid?

a. Leucine
b. Methionine
c. Dopamine
d. Taurine
e. Glycine

1118. What cations have the highest mobility among those listed below?
a. Ammonium cations
b. Lithium cations
c. Sodium cations
d. Potassium cations
e. Hydroxonium cations

1119. Vitamins and vitamin-like compounds are required for activation of higher fatty acids and their transport through the mitochondrial membrane. Name one such compound:
a. Thiamine
b. Biotin
c. Carnitine
d. Ubiquinone
e. Riboflavin

1120. Polymerase chain reaction (PCR) is widely used in modern laboratory diagnostics. What can be detected using this reaction?
a. Autoimmune disease
b. Nucleic acid of the microorganism
c. Allergy to the pathogen
d. Antibodies to the microorganism
e. Antigen of the microorganism

1121. To determine a certain second group cation, the <<golden rain>> reaction is used with slow cooling of the preheated reagents. What reaction product is formed during the slow precipitation?
a. AgI
b. PbI_2
c. Hg_2I_2
d. $PbCl_2$
e. HgI_2

1122. A mushroom picker, who accidentially ate death cap mushroom, has been hospitalised. Death cap toxin - alpha-amanitine - inhibits RNA-polymerase II in eukaryotes. What process requires this enzyme?
a. Reparation
b. Recognition
c. Transcription
d. Translation
e. Replication

1123. A patient complains of increased urine 24-hour volume and thirst. Laboratory analysis detects acetone and high levels of sugar in his urine. What hormone secretion is disturbed, leading to these changes?
a. Aldosterone
b. Testosterone
c. Insulin
d. Vasopressin
e. Glucagon

1124. Name the pharmacopoeial method for determining the relative molecular mass of high-molecular compounds:
a. Cryoscopy
b. Viscosimetry

c. Ebullioscopy
d. Calorimetry
e. Osmometry

1125. What method of titrimetric analysis requires the use of both external and internal indicators?
a. Nitrite titration
b. Argentometry
c. Alkalimetry
d. Permanganatometry
e. Complexometric titration

1126. What local anesthetic is given to patients with cardiac rhythm disorder?
a. Lidocaine
b. Caffeine and sodium benzoate
c. Morphine hydrochloride
d. Paracetamol
e. Nitrazepam

1127. 1 minute after a patient had been administered penicillin the patient's arterial pressure sharply dropped, pulse became thready, cold sweating and clonic convulsions began. Name this condition:
a. Burn shock
b. Cardiogenic shock
c. Anaphylactic shock
d. Septic shock
e. Traumatic shock

1128. What method of microspecimen staining is used to detect Mycobacterium tuberculosis?
a. Burri-Gins stain
b. Romanowsky-Giemsa stain
c. Ziehl-Nielsen stain
d. Gram stain
e. Neisser stain

1129. A 40-year-old man with allergic rhinitis has come to the dispensing chemist. He wants to substitute dimedrol (diphenhydramine), that he currently takes, with another antihistamine because dimedrol makes him drowsy and unable to concentrate. What drug would the dispensing chemist recommend?
a. Retabolil (Nandrolone)
b. Laferon (Interferon alfa-2b)
c. Loratadine
d. Analgin (Metamizole)
e. Aevit (Vitamins A and E)

1130. Wheat has linear inflorescences with biflorous sessile spikelets arranged in two rows. Name this type of inflorescence:
a. Compound spike
b. Panicle
c. Corymb
d. Spadix
e. Spike

1131. A 23-year-old patient has laryngeal diphtheria that manifests as classic clinical signs with the development of true croup. What type of inflammation is characteristic of this disease?
a. Serous
b. Putrid
c. Fibrinous
d. Croupous
e. Purulent

1132. What groups of antibiotics can be classified as beta-lactam antibiotics?
a. Cephalosporins, monobactams, aminoglycosides
b. Penicillins, cephalosporins, tetracyclines
c. Penicillins, cephalosporins, macrolides, carbapenems
d. Penicillins, cephalosporins, monobactams, carbapenems
e. Cephalosporins, macrolides, aminoglycosides

1133. A 65-year-old patient has been diagnosed with prostate adenoma. What adrenoblocker should he be prescribed?
a. Propranolol
b. Nifedipine
c. Metoprolol
d. Atenolol
e. Doxazosin

1134. It is known that heterologous antisera are obtained by means of animal immunization. What complications can arise when they are introduced into human body?
a. Allergic response
b. Visual impairment
c. Gastrointestinal disorders
d. Sensitivity loss
e. Water-electrolyte imbalance

1135. Microscopy of a root detects root hairs, which are the cell growths of:
a. Epidermis
b. Exodermis
c. Mesoderm
d. Epiblem
e. Endodermis

1136. What organelles in a plant cell accumulate reserve and ergastic substances and water, maintain osmotic pressure and turgor of the cell, contain cell sap, and are separated from the cytoplasm by a tonoplast?
a. Mitochondria
b. Ribosomes
c. Lysosomes
d. Chloroplasts
e. Vacuoles

1137. A chemist-analyst performs a qualitative analysis of group IV cations. Why is a 3% hydrogen peroxide solution added in the process?
a. Sediment formation
b. Conversion of ions to a lower degree of oxidation
c. Formation of colored compounds
d. Gas removal
e. Conversion of ions to a higher degree of oxidation

1138. Microscopy of a smear obtained from the pharyngeal mucosa of a sick child with suspected diphtheria detected yellow-brown bacilli with dark blue thickened ends. What staining method was used in this case?
a. Neisser stain
b. Ziehl-Neelsen stain
c. Aujeszky stain
d. Gram stain
e. Loeffler stain

1139. A person has extremely pale skin, white hair, and blue semi-transparent irises that under bright light assume a pink hue. These signs are caused by insufficient synthesis of the following in the patient's body:

a. Glucose
b. Serine
c. Melanin
d. Phenylalanine
e. Cholesterol

1140. Bacterioscopy of the smears prepared from urethral discharge detects there gram-positive intracellular diplococci. What microorganisms were detected in the material?
a. Gonococci
b. Staphylococci
c. Meningococci
d. Peptostreptococci
e. Streptococci

1141. According to the Smoluchowski coagulation theory, the process of coagulation can be described with the kinetic equation of:
a. The third order
b. The fraction order
c. The zero order
d. The second order
e. The first order

1142. Allopurinol is used to treat gout. What is the mechanism of action of this drug?
a. Xanthine oxidase activator
b. Xanthine oxidase coenzyme
c. Inhibitor of purine nucleotide synthesis
d. Competitive inhibitor of xanthine oxidase
e. Activator of purine nucleotide catabolism

1143. Name the difference in potentials that occurs due to uneven distribution of electrolytes between the outer and inner surfaces of the cell membrane:
a. Surface biopotential
b. Diffuse biopotential
c. Contact biopotential
d. Chemical biopotential
e. Membrane potential

1144. What reagent allows to simultaneously detect aldehyde group and glycol fragment presence in glucose molecule?
a. Cu(OH)_2
b. Br_2
c. AlCl_3
d. KMnO_4
e. FeCl_3

1145. A pregnant woman suffers from pneumonia: the term of pregnancy is 20 weeks. What chemotherapeutical drug not dangerous to development of the fetus can be prescribed to the patient?
a. Ofloxacin
b. Gentamicin
c. Levomycetin (Chloramphenicol)
d. Sulfalene
e. Benzylpenicillin

1146. A patient with a diagnosis of drug poisoning has been admitted to a 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. Impaired function of spinal cord motoneurons
b. Inhibition of the respiratory center function

c. Diminished chest mobility
d. Pulmonary dysfunction
e. Impaired function of the neuromuscular system

1147. Emulsions containing less then 0,1% of dispersed phase (in volume) are classified as:
a. High-concentration
b. Oil-in-water type
c. Concentrated
d. Water-in-oil type
e. Diluted

1148. Plant fatty acids have an odd number of carbon atoms. What product forms as a result of beta-oxidation of fatty acids with an odd number of carbon atoms?
a. Stearoyl-CoA
b. Palmitoyl-CoA
c. Propionyl-CoA
d. Acetoacetyl-CoA
e. Oxymethylglutaryl-CoA

1149. Althaea officinalis root assumes a marked blue hue on section when processed with methylene blue, which indicates the presence of:
a. Lipids
b. Mucus
c. Inulin
d. Glycogen
e. Starch

1150. What enzyme catalyzes the reaction of activation of amino acids and their attachment to a specific tRNA?
a. DNA ligase
b. Ribonuclease
c. Aminoacyl-tRNA synthetase
d. Nucleotidase
e. Deoxyribonuclease

1151. A man has been hospitalized into the intensive care unit in a severe condition after carbon monoxide poisoning. What substance has formed in this case, causing the severe condition in the patient?
a. Methemoglobin
b. Carbhemoglobin
c. Oxyhemoglobin
d. Fetal hemoglobin
e. Carboxyhemoglobin

1152. 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. Purine nucleotides synthesis
d. Carbohydrate disintegration
e. Pyrimidine nucleotides synthesis

1153. Chlorophyta division representatives have chromatophores of various shapes in their cells. What genus includes species with ribbon-shaped chromatophores?
a. Spirogyra
b. Spirulina
c. Chlamidomonas
d. Volvox
e. Chlorella

1154. What product forms as a result of a reaction between aniline and benzaldehyde?
a. Cyanohydrin
b. N,N-dimethylaniline
c. Oxime
d. Hemiacetal
e. N-benzylideneaniline

1155. A 45-year-old patient with rheumatoid arthritis was prescribed a glucocorticoid. Name this drug:
a. Insulin
b. Prednisolone
c. Mefenamic acid
d. Ibuprofen
e. Analgine (Metamizole)

1156. If in the process of molecular adsorption the solute is being adsorbed more than the solvent, then the following occurs:
a. Ion adsorption
b. No adsorption
c. Positive adsorption
d. Selective adsorption
e. Negative adsorption

1157. A herbaceous plant of Malvaceae famiy has expectorant and coating properties. The plant has pale pink flowers gathered into apical panicles and schizocarpous fruit, which means it belongs to the following species:
a. Plantago psyllium
b. Tussilago farfara
c. Thymus serpyllum
d. Plantago major
e. Althaea officinalis

1158. The material obtained from a patient with suspected acute Salmonella-induced gastroenteritis was sent to a bacteriological laboratory. What should be used in this case for serological identification of the isolated pure bacterial culture?
a. Agglutinating diagnostic serum for salmonellosis
b. Live pure culture of Salmonella
c. Salmonellosis diagnosticum
d. Erythrocytic salmonellosis diagnosticum
e. Patient's blood serum

1159. Choose the colloid surfactant out of the substances listed below:
a. Iodine
b. Polyethylene
c. Gelatin
d. Sodium chloride
e. Potassium oleate

1160. A patient is pale, has goose bumps and chills. What stage of fever is it characteristic of?
a. Temperature decrease
b. Compensation
c. Continuous fever
d. Temperature increase
e. Latent stage

1161. After ishemic stroke the patient was prescribed a drug to improve his intellectual functioning and memory. What drug would he obtain in the pharmacy?
a. Tabex (Cytisine)
b. Metoclopramide
c. Diphenin (Phenytoin)

d. Piracetam
e. -

1162. The surface activity of diphilic molecules can be described using the Traube-Duclos rule. How will the surface activity of fatty acids change in the area of low concentrations, if the length of the hydrocarbon radical increases by three –CH_2- groups?
a. It will remain unchanged
b. It will become 3 times lower
c. It will become 27 times higher
d. It will become 9 times higher
e. It will become 27 times lower

1163. A 55-year-old man came to a doctor with complaints of acute pain in his big toes. Meat and wine are a permanent fixture 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. Lactate
c. Uric acid
d. Urea
e. Bilirubin

1164. Name the substance that is the initial compound in the polymerization reaction:
a. Monomer
b. Polypeptide
c. Dimer
d. Polymer
e. Nucleophile

1165. A stool sample obtained from a patient with suspected shigellosis was inoculated on the Ploskirev nutrient medium. What will be the color of the colonies of the dysentery pathogen in this medium?
a. Colorless
b. Yellow
c. Dark brown
d. Blue-violet
e. Red with a metallic sheen

1166. In hypoxia, lactic acid accumulates in the blood. Name the end product of anaerobic glycolysis.
a. Malate
b. CO_2 and H_2O
c. Alanine
d. Oxaloacetate
e. Lactate

1167. What component of a plant cell determines the water content in the plant's internal environment, regulates water-salt metabolism, maintains turgor, and accumulates substances?
a. Endoplasmic reticulum
b. Chloroplasts
c. Golgi complex
d. Mitochondria
e. Vacuoles

1168. A patient has a gallstone lodged in the common bile duct, which blocks bile supply to the intestine. What digestive process will be disturbed in this case?
a. Carbohydrate absorption
b. Protein digestion
c. Carbohydrate digestion
d. Protein absorption
e. Fat digestion

1169. If addition of an alkali solution and heating provokes the release of ammonia in an analyzed solution, it indicates that the analyzed solution contains the following ions:

a. Na^+

b. NO_3^-

c. NH_4^+

d. K^+

e. NO_2^-