1. What substance is a unique accumulator, donor, and transformer of energy within the body?
a. Creatine phosphate
b. Acetyl-CoA
c. Succinyl-CoA
d. Phosphoenolpyruvate
e. Adenosine triphosphate

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

3. A patient was prescribed an antiplatelet agent that has an effect on thromboxane A_2 formation in platelets. What drug is it?
a. Adrenaline tartrate
b. Menadione
c. Acetylsalicylic acid
d. -
e. Prednisolone

4. A plant is completely submerged in water. What ecological group does this plant belong to?
a. Xerophytes
b. Mesophytes
c. Hydrophytes
d. Succulents
e. Hygrophytes

5. What cations are present in a solution if, after adding dimethylglyoxime (Chugaev reagent) and ammonia buffer solution to it, a bright crimson intracomplex compound forms as a result?
a. Cobalt cations
b. Nickel cations
c. Copper cations
d. Aluminum cations
e. Calcium cations

6. The fructose molecule belongs to ketoses. What phenomenon causes fructose to take part in the "silver mirror" reaction?
a. Epimerization
b. Conformation
c. Condensation
d. Mutarotation
e. Dehydration

7. A 50-year-old patient has been hospitalized into the intensive care unit with complaints of weakness, shortness of breath, and constricting pain behind the sternum. Examination reveals that the pateint's condition is moderately severe, heart rate - 80/min, blood pressure - 130/85 mm Hg. ECG shows deep Q waves and ST segment elevation. Acutely increased activity of AST, CPK-MB, and troponins is observed in the blood. What pathological condition can be characterized by the described symptoms and laboratory test results?
a. Pulmonary embolism
b. Angina pectoris
c. Pericarditis
d. Myocardial infarction
e. Myocarditis

8. The synthesis of thyroid hormones is carried out from tyrosine in a special protein of the thyroid

gland. Name this protein.
a. Immunoglobulin
b. Interferon
c. Thyroglobulin
d. Histone
e. Albumin

9. Bacteriology of secretions from the patient's wound, stained using the Gram technique, revealed purple spherical microorganisms, arranged like a grape cluster. What microorganisms are the most likely cause of this disease?
a. S. aureus
b. Neisseria
c. Salmonella typhimurium
d. E) coli
e. Proteus vulgaris

10. What indicator is used in argentometric determination of chloride ions in Mohr's method?
a. Eosin
b. Diphenylcarbazone
c. Methyl red
d. Fluorescein
e. Potassium chromate

11. A patient has pulmonary edema. What drug must be prescribed in this case to reduce the volume of circulating blood?
a. Magnesium sulfate
b. Verapamil hydrochloride
c. Metoprolol
d. Amiodarone hydrochloride
e. Furosemide

12. A woman with candidiasis was prescribed an antifungal drug that disrupts the synthesis of ergosterol, but can cause dyspeptic disorders (diarrhea, nausea), hepatotoxicity, and headache as its side effects. What drug is it?
a. Fluconazole
b. Albendazole
c. Acyclovir
d. Metronidazole
e. Clarithromycin

13. What laboratory glassware is used for dissolving an exactly measured out sample when preparing a primary standard solution?
a. Cylinder
b. Measuring flask
c. Test tube
d. Measuring glass
e. Beaker

14. A pharmaceutical company is developing a new antitumor drug that targets an enzyme that takes part in DNA replication. What enzyme is targeted by this drug?
a. Aminoacyl-tRNA synthetase
b. Topoisomerase
c. Reverse transcriptase
d. RNA polymerase
e. Peptidyl transferase

15. A doctor has prescribed benzylpenicillin for the treatment of a surgical patient with numerous abscesses of staphylococcal etiology. What is the mechanism of action of this antibiotic?
a. Inhibition of cytoplasmic membrane functions

b. Inhibition of DNA topoisomerases
c. Disruption of cell wall synthesis
d. Disruption of ribosomal protein synthesis
e. Disruption of nucleic acid synthesis

16. What structures enable the release of weak solutions of mineral (or, less often, organic) substances in the form of droplets and are arranged in groups on the serrations of the leaf margin?
a. Idioblasts
b. Emergences
c. Laticifers
d. Hydathodes
e. Osmophores

17. What enzyme is used to synthesize genes from matrix RNA on DNA in RNA-containing viruses?
a. Helicase
b. DNA ligase
c. Endonuclease
d. Reverse transcriptase
e. Exonuclease

18. A 45-year-old woman developed an acute inflammatory disease of the upper respiratory tract and eyes during the season of flowering. She presents with hyperemia, edema, and mucous discharge. What type of leukocytosis would be most characteristic in this case?
a. Lymphocytosis
b. Basophilia
c. Eosinophilia
d. Monocytosis
e. Neutrophilia

19. What method of instrumental analysis can be used for quantification of hydrochloric and boric acids in a mixture?
a. Infrared spectroscopy
b. Spectrophotometry
c. Chromatography
d. Polarimetry
e. Potentiometry

20. When harvesting inflorescences, it was determined that their main axis was well developed and the flowers were almost at the same level, despite being attached to peduncles of varying length. What type of inflorescence is it?
a. Botryoid
b. Flat capitulum
c. Umbel
d. Corymb
e. Spike

21. A plant has essential oil glands, its fruit is an achene, its inflorescence is a flat capitulum. What plant family can be characterized by such features?
a. Scrophylariaceae
b. Asteraceae
c. Solanaceae
d. Rosaceae
e. Lamiaceae

22. What bioactive peptide is a major intracellular antioxidant and performs coenzyme functions?
a. Hemoglobin
b. Liberine
c. Glutathione
d. Bradykinin

e. Oxytocin

23. Analyzis of a medicinal plant shows that its leaves are collected into a basal rosette, the leaves themselves are broadly ovate or elliptic with arcuate venation, while the flowers are small, unremarkable, and assembled into an inflorescence - a dense spike. What plant can be characterized by such features?

a. Vinca minor
b. Althaea officinalis
c. Plantago major
d. Chelidonium majus
e. Taraxacum officinale

24. A 15-year-old girl complains of general weakness, dizziness, and frequent fainting spells. She does not eat enough. Recently, she has been noticing a distortion of taste, a desire to eat chalk and raw minced meat. Her menstruations have been occurring since the age of 13 and are profuse and irregular. What substance causes sideropenic syndrome if its levels in the human body are low?

a. Vitamin B_12
b. Folic acid
c. Copper
d. Hemosiderin
e. Iron

25. Protein-containing liquids, where proteins must remain undenatured, undergo sterilization at the temperature of 56-58^oC in several 60-minute-long sessions over the course of 5 days. What method of sterilization is it?

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

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

a. Azomethine
b. Thiol
c. Nitrile
d. Diazine
e. Alcohol

27. Interleukin-1 is one of the secondary pyrogens in a fever. What cells are the main producers of this pyrogen?

a. Tissue basophils
b. Lymphocytes
c. Platelets
d. Eosinophils
e. Macrophages

28. What value is used when calculating the osmotic pressure of electrolyte solutions according to the Van 't Hoff's law?

a. Isotonic coefficient
b. Osmotic coefficient
c. Activity coefficient
d. Ebullioscopic constant
e. Cryoscopic constant

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

a. Hypoxic hypoxia
b. Circulatory hypoxia
c. Tissue hypoxia

d. Respiratory hypoxia
e. Hemic hypoxia

30. During practice, a student was tasked with classifying plants, dividing them into monocotyledons and dicotyledons. What family of plants belongs to the monocotyledons?
a. Rosaceae
b. Lamiaceae
c. Poaceae
d. Fabaceae
e. Brassicaceae

31. What specific reagent is used for identification of Fe^2+ cations?
a. NH_4OH
b. K_2Na[Co(NO_2)_6]
c. K_3[Fe(CN)_6]
d. H_2SO_4
e. NaOH

32. Name the phenomenon when aerosol particles move in the direction of decreasing temperature.
a. Peptization
b. Sedimentation
c. Electrophoresis
d. Thermophoresis
e. Photophoresis

33. A patient has been admitted to the hematology department of a hospital. He has history of frequent cases of acute respiratory viral infections and tonsillitis. Examination reveals enlarged lymph nodes. Blood test results: anemia, lymphocytosis, a small number of lymphoblasts, and Gumprecht shadows in the blood smear. What pathology has most likely occurred in this patient?
a. Multiple myeloma
b. Chronic myeloid leukemia
c. Lymphogranulomatosis
d. Chronic lymphocytic leukemia
e. Agranulocytosis

34. What H_2-histamine blocker can be used to treat peptic ulcer disease of the stomach with increased secretory function?
a. Levocetirizine
b. Famotidine
c. Omeprazole
d. Atropine sulfate
e. Drotaverine hydrochloride

35. What is the effect of electron-accepting substituents (type II substituents) on the course of electrophilic substitution (SE) reactions in arenes?
a. They slow down the reaction and are ortho- and para-directors
b. They slow down the reaction and are meta-directors
c. They have no effect on the reaction
d. They speed up the reaction and are meta-directors
e. They speed up the reaction and are ortho- and para-directors

36. A man diagnosed with epilepsy has been taking phenobarbital for a long time. Over time, he has noticed a decrease in the therapeutic effect of the drug - he has developed tolerance to this drug. What is the mechanism of developing tolerance to phenobarbital?
a. Acceleration of biotransformation
b. Inhibition of biotransformation
c. Weakening of the absorption process
d. Increased sensitivity of receptors
e. Accumulation of the substance in the body

37. When studying the chemical properties of an organic compound, it was established that it exhibits basic properties and easily undergoes halogenation and diazotization reactions. What compound meets these criteria?

a. Aniline
b. Phenol
c. Toluene
d. Naphthalene
e. Benzene

38. After a long course of antibiotic therapy, the patient developed a complication characterized by the formation of white coating on the oral mucosa. Microscopy of swabs from the affected areas reveals oval budding microorganisms. Inoculation of the obtained material on the Sabouraud medium results in growth of smooth white colonies. What drug should be used for the etiotropic treatment of this disease?

a. Acyclovir
b. Albendazole
c. Isoniazid
d. Fluconazole
e. Doxycycline

39. Allopurinol is used to reduce the formation of uric acid in the treatment of gout. What enzyme is inhibited by this medicine?

a. Arginase
b. Lactate dehydrogenase
c. Xanthine oxidase
d. Amylase
e. Catalase

40. A 14-year-old boy, who has been suffering from bronchial asthma since childhood, after significant physical exertion developed shortness of breath and impaired respiratory rate and depth, characterized by difficult and prolonged exhalation. What pathological type of breathing has developed in this case?

a. Inspiratory dyspnea
b. Gasping
c. Biot's breathing
d. Expiratory dyspnea
e. Kussmaul breathing

41. What is characteristic of benign tumors?

a. Infiltrating growth
b. Invasion into the surrounding tissues
c. Cancer cachexia
d. Metastasis
e. Expansive growth

42. What group of broncholytics is used for treatment of patients with bronchial asthma?

a. beta-adrenergic blockers
b. Muscarinic agonists
c. Nicotinic agonists
d. beta_2-adrenergic agonists
e. Anticholinesterase drugs

43. A pharmacy has decided to use the biological method to test the quality of instrument sterilization in an autoclave. What microorganisms should be used for this purpose?

a. Yersinia pestis
b. Borrelia recurrentis
c. Bacillus subtilis
d. Streptococcus pyogenes

e. Salmonella typhi

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

a. Dermal tissue
b. Secretory tissue
c. Mechanical tissue
d. Parenchyma
e. Meristematic tissue

45. Monosaccharides can be easily oxidized, but depending on the nature of the oxidant and the conditions under which oxidation occurs, different products will form. What compound forms when D-glucose is oxidized using bromine water?

a. D-Glucaric acid
b. D-glucose osazone
c. D-Gluconic acid
d. Bromoderivative of D-glucose
e. D-Glucuronic acid

46. Pathogenic microorganisms can be characterized by the presence of enzymes of aggression that determine their virulence. Select an enzyme of aggression from the list below.

a. Hyaluronidase
b. Carbohydrase
c. Oxidase
d. Transferase
e. Lyase

47. What electrode can be used as an indicator electrode in titration of bases?

a. Calomel electrode
b. Quinhydrone electrode
c. Silver chloride electrode
d. Glass electrode
e. Platinum electrode

48. Administration of adrenaline increases glucose levels in the blood. What process is mainly activated in this case?

a. Glycogenesis
b. Lipogenesis
c. Glycogenolysis
d. Pentose phosphate pathway
e. Gluconeogenesis

49. What adsorption indicator is used in quantification of iodides by means of the Fajans method?

a. Methyl orange
b. Murexide
c. Diphenylamine
d. Phenolphthalein
e. Eosin

50. What is the structural formula for 3-chloropropene?

a. $CH_2=CH-CH=CHCl$
b. $ClCH_2-CH=CH-CH_3$
c. $ClCH=CH-CH_3$
d. $ClCH_2-CH=CH_2$
e. $CH_2=CCl-CH_3$

51. In the cells of eukaryotic organisms, the DNA is bound to proteins. What proteins are bound to the DNA molecule and stabilize it?

a. Albumins

b. Globulins
c. Histones
d. Interferons
e. Glutelins

52. Which one of the listed solutions will have the highest Van't Hoff isotonic coefficient, if their molar concentration and temperature are the same?
a. $CaCO_3$
b. $AlBr_3$
c. $C_6H_{12}O_6$
d. LiCl
e. $MgCl_2$

53. A patient with arterial hypotension accompanied by collapse was administered phenylephrine hydrochloride to increase the blood pressure. What receptors are stimulated by this drug?
a. Angiotensin receptors
b. Nicotinic acetylcholine receptors
c. alpha-adrenergic receptors
d. Muscarinic acetylcholine receptors
e. beta-adrenergic receptors

54. Berberis vulgaris has spines that are modifications of:
a. Stems
b. Stipules
c. Leaves
d. Petioles
e. Rachises

55. Select from the list a quantitative characteristic of Brownian motion.
a. Coefficient of friction
b. Average particle displacement over time
c. Resistance of the medium
d. Diffusion coefficient
e. Coefficient of proportionality

56. What anticholinesterase agent can be used to stimulate intestinal peristalsis in the patients during the postoperative period?
a. Suxamethonium chloride
b. Salbutamol
c. Metoprolol
d. Adrenaline tartrate
e. Neostigmine methylsulfate

57. Which one of the listed heterocyclic compounds exhibits the strongest basic properties?
a. Pyrrolidine
b. Pyrrole
c. Furan
d. Pyridine
e. Thiophene

58. What principle is used when calculating the phase transition temperature at different pressure?
a. Mendeleev-Clapeyron equation
b. Konovalov rules
c. Trouton rule
d. Gibbs phase rule
e. Clausius-Clapeyron equation

59. A patient diagnosed with arterial hypertension has been prescribed a drug with an antihypertensive, antianginal, and antiarrhythmic effect. Name this drug.

a. Adrenaline tartrate
b. Fenoterol
c. Dopamine hydrochloride
d. Metoprolol
e. Clonidine

60. What group reagent can be used to separate group III cations (acid-base classification), when conducting systematic analysis of a mixture?
a. Alkali and hydrogen peroxide
b. Barium chloride
c. Sulfuric acid
d. Hydrochloric acid
e. Ammonia

61. Microscopy of the leaf epidermis reveals stinging hairs with a tall multicellular base, into which the base of an ampoule-shaped living cell with a small head filled with formic acid is immersed. What plant can be characterized by such emergences?
a. Bidens tripartita
b. Chelidonium majus
c. Achillea millefolium
d. Urtica dioica
e. Artemisia absinthium

62. In systematic analysis of group IV cations, hydrogen peroxide must be added along with the group reagent. Why must this substance be added?
a. For formation of hydroxo- and oxoanions of these elements at the lowest oxidation degrees
b. For formation of peroxide compounds of these cations
c. For destruction of hydrate complexes
d. For formation of hydroxo- and oxoanions of these elements at the highest oxidation degrees
e. For more complete precipitation of these cations

63. Disperse systems can be divided into lyophilic and lyophobic ones, based on the intensity of interaction between the particles of the dispersed phase and the dispersion medium. What disperse system is lyophobic?
a. Solutions of high-molecular compounds
b. Foams
c. Surfactant solutions
d. Tannin solutions
e. Clay dispersions

64. What reaction can be used to identify multiple bonds in organic compounds?
a. Hofmann rearrangement
b. Friedel-Crafts alkylation
c. Wagner reaction
d. Claisen condensation
e. Kucherov reaction

65. What method of chromatographic analysis can be used for separation, identification, and quantification of methanol and ethanol in a mixture?
a. Paper chromatography
b. Planar chromatography
c. Gas-liquid chromatography
d. Precipitation chromatography
e. Ion exchange chromatography

66. When a pharmaceutical company was manufacturing an enzyme drug, a violation of the technological process occurred: the drug was heated to 85^oC. What changes will be observed in its enzyme activity?
a. Minor changes in enzyme activity due to enzyme thermostability

b. Increased enzyme activity due to increased molecular motion
c. Temporary decrease in enzyme activity that later resumes after cooling
d. Protein denaturation and complete loss of enzyme activity
e. Impaired structure of metal ions in the active site

67. D-galactose reacts with an ammonia solution of silver oxide. What functional group makes this reaction possible?
a. Ether group
b. Hydroxyl group
c. Ester group
d. Carboxyl group
e. Aldehyde group

68. What medium is used in quantification of halide ions by means of Volhard method (thiocyanometry)?
a. Weakly alkaline
b. Nitric acid
c. Phosphate acid
d. Strongly alkaline
e. Neutral

69. A sample of medicinal raw material was inoculated on the Sabouraud medium in order to detect phytopathogenic microorganisms in it. What microorganisms are detected this way?
a. Actinomycetes
b. Bacteria
c. Protozoa
d. Viruses
e. Fungi

70. What drug inhibits hydroxymethylglutaryl-CoA reductase enzyme and reduces cholesterol synthesis?
a. Lisinopril
b. Atorvastatin
c. Hydrochlorothiazide
d. Amlodipine besylate
e. Furosemide

71. A 54-year-old man with 4-year-long history of chronic glomerulonephritis and 2-year-long history of persistent arterial hypertension made an appointment with a doctor. What substance synthesized in the kidneys plays an important role in the development of arterial hypertension in this patient?
a. Vitamin D
b. Nitric oxide
c. Erythropoietin
d. Aldosterone
e. Renin

72. What pair of compounds can be distinguished from each other using the silver mirror reaction?
a. Propanal and propanone
b. Propane and propene
c. n-Butane and isobutane
d. Ethanol and ethylene glycol
e. 1,3-Butadiene and 1,2-butadiene

73. An alkali was added into the solution being analyzed. When heated, the solution produced a gas. This gas changes the color of a moist litmus paper from red to blue, which indicates the presence of the following ions in the solution:
a. CO_3^2-
b. NH_4^+
c. Pb^2+

d. Cl^-
e. Bi^3+

74. What law underlies the method of spectrophotometry in the ultraviolet region of the spectrum?
a. Rayleigh law
b. Faraday law
c. Ohm law
d. Beer-Bouguer-Lambert law
e. Stokes-Lommel law

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

76. A 55-year-old patient was prescribed an organic nitrate drug for rapid relief of angina pectoris attacks. Select this drug from the list.
a. Verapamil hydrochloride
b. Propranolol hydrochloride
c. -
d. Digoxin
e. Glycerol trinitrate

77. In human body, stable glucose levels are maintained by balanced levels of insulin and counterinsular hormones. What endocrine pathology causes development of persistent hypoglycemia?
a. Acromegaly
b. Insulinoma
c. Thyrotoxicosis
d. Cushing disease
e. Pheochromocytoma

78. What type of pharmaceutical interaction is it, when absorption of tetracycline drugs becomes reduced if they are taken simultaneously with antacids?
a. Pharmacodynamic incompatibility
b. Pharmaceutical incompatibility
c. Pharmacokinetic incompatibility
d. Functional antagonism
e. Synergism

79. A 34-year-old woman with bronchitis has persistent, dry, non-productive cough. Her physician prescribed her a centrally acting antitussive drug. Select this drug from the list.
a. Ambroxol hydrochloride
b. Glaucine hydrochloride
c. Bromhexine hydrochloride
d. Mucaltin
e. Acetylcysteine

80. What is the typical sign of the initial stage of acute renal failure?
a. Dysuria
b. Polyuria
c. Nocturia
d. Anuria
e. Pollakiuria

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

a. 5 mmol/L
b. 20 mmol/L
c. 15 mmol/L
d. 10 mmol/L
e. 1 mmol/L

82. After examination, a child was diagnosed with scarlet fever. What microorganism is the causative agent of this disease?
a. Meningococcus
b. Streptococcus
c. Klebsiella
d. Staphylococcus
e. Actinomycete

83. A 45-year-old man has been hospitalized with intense pain in the right hypochondrium. He was diagnosed with cholelithiasis accompanied by biliary colic. What drug should be prescribed in this case to eliminate the pain syndrome?
a. Bisacodyl
b. -
c. Drotaverine hydrochloride
d. Pancreatin
e. Almagel

84. What type of chromatography includes the gas-liquid chromatography?
a. Adsorption chromatography
b. Affinity chromatography
c. Ion exchange chromatography
d. Distribution chromatography
e. Gel chromatography

85. Disperse systems can be distinguished from true solutions by the bluish glow of colloidal solutions against a dark background when illuminated from the side. Name this phenomenon.
a. Opalescence
b. Chemiluminescence
c. Scattering
d. Emission
e. Fluorescence

86. What end product forms as a result of beta-oxidation of fatty acids with an odd number of carbon atoms?
a. Acetoacetyl-CoA
b. Propionyl-CoA
c. Palmitoyl-CoA
d. Stearoyl-CoA
e. Acetyl-CoA

87. Microbiological testing of vaginal suppositories shows that they do not meet the requirements of the Pharmacopoeia. What microflora was detected in the suppositories, causing this conclusion?
a. Tetracocci
b. Micrococci
c. Sarcina
d. Lactobacilli
e. Pseudomonas aeruginosa

88. What compound contains a primary aromatic amino group?
a. (C_6H_5)_3N (triphenylamine)
b. (CH_3)_2NH (dimethylamine)
c. C_6H_5-NH_2 (aniline)
d. (CH_3)_3N (trimethylamine)

e. (CH_3)_3C-NH_2 (tert-butylamine)

89. A patient diagnosed with arterial hypertension was prescribed lisinopril. What is the mechanism of action of this drug?
a. Stimulation of beta-adrenergic receptors
b. Blockade of beta-adrenergic receptors
c. Inhibition of angiotensin-converting enzyme
d. Stimulation of alpha_2-adrenergic receptors
e. Blockade of calcium channels in vascular smooth muscle

90. What amine causes a positive isonitrile reaction?
a. Diethylamine
b. Diphenylamine
c. N,N-Dimethylamine
d. Benzylamine
e. Tetramethylammonium chloride

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

92. What is the name of the five-membered heterocycle that contains nitrogen heteroatoms of the pyrrole and pyridine type?
a. Triazole
b. Pyrazole
c. Piperidine
d. Thiazole
e. Pyrazolidine

93. Phellogen forms from pericycle or ground tissue that develops meristematic activity. What type of tissue is phellogen?
a. Meristematic
b. Vascular
c. Mechanical
d. Secretory
e. Dermal

94. At a pharmaceutical factory, an alkaloid must be extracted from a herbal raw material. What would ensure effective extraction of this substance?
a. Solvents must have similar polarity values
b. The substance must have different solubility in two different solvents
c. Solvents must be miscible with each other
d. The extraction process must be carried out at a high temperature
e. The substance must enter into a chemical reaction with the solvent

95. A bodybuilder athlete came to a pharmacy complaining of hyperthermia. To improve his athletic performance, he used the banned doping compound 2,4-dinitrophenol that uncouples oxidative phosphorylation. What effect of this compound on mitochondria can explain these symptoms?
a. Increased use of ATP for cAMP synthesis
b. Decreased oxygen consumption and inhibition of ATP synthesis
c. Increased acetyl-CoA levels and stimulation of tricarboxylic acid cycle
d. Decreased ATP synthesis and energy release in the form of heat
e. Increased oxygen consumption and activation of ATP synthesis

96. In the process of studying a new lipophilic compound, it was established that after glucuronidation

it rapidly excretes with urine. What is the significance of glucuronidation in drug metabolism?
a. Intensifying breakdown and absorption in the stomach
b. Preventing binding to the target receptor
c. Increasing water solubility for renal excretion
d. Strengthening plasma protein binding
e. Increasing lipophilicity to improve absorption

97. What titrimetric methods can be used for quantification of streptocide (sulfanilamide, a primary aromatic amine) in a drug?
a. Bromatometry, complexonometry
b. Complexonometry, nitritometry
c. Nitritometry, argentometry
d. Bromatometry, nitritometry
e. Permanganometry, bromatometry

98. Species pectorales herbal tea contains pieces of bright yellow, sweet-tasting roots. What medicinal plant is it?
a. Plantago major
b. Acorus calamus
c. Glycyrrhiza glabra
d. Valeriana officinalis
e. Althaea officinalis

99. What structures of a flower originate from the stem?
a. Pedicel and receptacle
b. Stamens and pistils
c. Calyx and corolla
d. Receptacle and perianth
e. Calyx and stamens

100. What inflorescences are most typical of the Brassicaceae family?
a. Compound corymb, compound umbel
b. Round or flat capitulum
c. Corymb, umbel
d. Spadix, spike
e. Raceme, panicle

101. A patient was prescribed losartan potassium for treatment of arterial hypertension. What is the mechanism of action of this drug?
a. Blockade of angiotensin receptors
b. Inhibition of angiotensin-converting enzyme
c. Inhibition of phosphodiesterase
d. Calcium channel block
e. Activation of central alpha-adrenergic receptors

102. After adding a barium chloride solution to the solution being analyzed, a white precipitate, insoluble in acids and alkalis, formed. What anions are present in the analyzed solution?
a. Sulfate anions
b. Carbonate anions
c. Nitrate anions
d. Chloride anions
e. Phosphate anions

103. What heterocycle has acidophobic properties?
a. Pyrrole
b. Thiophene
c. Pyrimidine
d. Pteridine
e. Quinoline

104. What compound is a base for organic dyes and belongs to isolated polynuclear arenes?
a. Benzene
b. Anthracene
c. Triphenylmethane
d. Cumene
e. Phenanthrene

105. How does the value of the critical micelle concentration in homologous series change when the molecular mass of the surfactant increases?
a. Sharply increases
b. Decreases
c. Increases
d. Reaches its maximum and then decreases
e. Remains unchanged

106. 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. Crystalline sand
b. Globoids
c. Cystoliths
d. Styloids
e. Druses

107. 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 besides its diuretic effect?
a. Irritant
b. Analgesic
c. Antispasmodic
d. Potassium-sparing
e. Sedative

108. Morphological analysis shows that the length of a leaf blade exceeds 1.5-2 times its width and the widest part is located closer to the base. What shape of the leaf blade is it?
a. Lanceolate
b. Narrowly ovate
c. Elliptic
d. Ovate
e. Linear

109. A person has been hospitalized with the diagnosis of malaria. What route of infection transmission is characteristic of this disease?
a. Direct contact transmission
b. Fecal-oral transmission
c. Arthropod-borne transmission
d. Indirect contact transmission
e. Airborne and droplet transmission

110. For tetanus prevention a certain toxin is used. This toxin is being inactivated with formaldehyde (0.4%) under the temperature of 39^oC over the course of 4 weeks. Name the resulting preparation.
a. Killed vaccine
b. Antitoxic serum
c. Immunoglobulin
d. Adjuvant
e. Anatoxin

111. A Gram-stained smear shows large oval violet cells that form pseudomycelium. Name these microorganisms.
a. Plasmodium malariae

b. Mucor fungi
c. Candida fungi
d. Actinomycetales
e. Penicillium fungi

112. A 65-year-old man developed third-degree atrioventricular block. What medicine should be prescribed for this patient?
a. Amiodarone hydrochloride
b. Metoprolol
c. Atropine sulfate
d. Verapamil hydrochloride
e. Digoxin

113. Ledum palustre leaves are leathery, with a flat elongated leaf blade, curved downward edges, and brown hairs on the underside. What family does this plant belong to?
a. Ericaceae
b. Rosaceae
c. Brassicaceae
d. Fabaceae
e. Lamiaceae

114. Primary and secondary nitroalkanes are tautomeric compounds. What tautomerism is characteristic of these compounds?
a. Lactam-lactim tautomerism
b. Keto-enol tautomerism
c. Amino-imino tautomerism
d. Tautomerism of azoles
e. Aci-nitro tautomerism

115. What fluid will cause plasmolysis of human blood cells, if it is mistakenly administered intravenously?
a. 3.5% NaCl solution
b. 0.9% glucose solution
c. 0.9% NaCl solution
d. 3.5% glucose solution
e. Distilled water

116. On day 20 after a massive hemorrhage, the patient with an injury to the subclavian artery underwent a blood test. What blood test findings indicate an increase in erythropoiesis?
a. Reticulocytosis
b. Poikilocytosis
c. Anisochromia
d. Anisocytosis
e. Hypochromia

117. A 48-year-old patient complains of thirst, frequent urination, dryness of skin and mucosa, and trophic ulcers that appeared on his legs. Examination detects blood glucose levels of 16 mmol/L and glucose in urine. What disease has occurred in the patient?
a. Kidney failure
b. Diabetes mellitus
c. Diabetes insipidus
d. Nephrogenic diabetes insipidus
e. Insulinoma

118. A newborn has been diagnosed with Down syndrome, accompanied by mental retardation, short stature, short fingers and toes, and Mongoloid slant of the eyes. Karyotyping detects trisomy 21. What type of hereditary pathology is Down syndrome?
a. Gametopathy
b. Chromosome abnormality

c. Blastopathy
d. Fetopathy
e. Molecular genetics disease

119. A flower has many stamens, fused together by filaments into several bundles. What type of androecium is it?
a. Didynamous
b. Diadelphous
c. Polyadelphous
d. Tetradynamous
e. Monadelphous

120. The manufacturer has stated that the half-life of ibuprofen is 2 hours. A patient has been prescribed 400 mg of the drug. How much ibuprofen (mg) will remain in the patient's body 6 hours after taking this dose of the drug?
a. 100
b. 50
c. 0
d. 25
e. 150

121. Microscopy of a rhizome detects periphloematic vascular bundles. What plant does this rhizome belong to?
a. Convallaria majalis
b. Acorus calamus
c. Elymus repens
d. Dryopteris filix-mas
e. Potentilla erecta

122. What titrants are used in quantification of iodides by means of back titration, using the Volhard method?
a. Mercury(II) nitrate, ammonium thiocyanate
b. Mercury(I) nitrate, potassium thiocyanate
c. Silver nitrate, ammonium thiocyanate
d. Silver nitrate, sodium chloride
e. Mercury(I) nitrate, ammonium thiocyanate

123. A 65-year-old man has been diagnosed with benign prostatic hyperplasia. What adrenoblocker should he be prescribed?
a. Metoprolol
b. Adrenaline tartrate
c. -
d. Propranolol hydrochloride
e. Doxazosin mesylate

124. Amylolytic enzymes catalyze hydrolysis of polysaccharides and oligosaccharides. They have an effect on the following chemical bond:
a. Hydrogen bond
b. Peptide bond
c. Glycosidic bond
d. Phosphodiester bond
e. Amide bond

125. What antiprotozoal drug has anti-Helicobacter pylori effect?
a. Isoniazid
b. Albendazole
c. -
d. Rifampicin
e. Metronidazole

126. A 35-year-old patient complains of intense thirst, headache, and irritability. The 24-hour fluid intake is 9 liters. The 24-hour diuresis is increased. The patient was diagnosed with diabetes insipidus. This pathology is associated with impaired production of a certain hormone. Name this hormone.

a. Aldosterone
b. Glucocorticoids
c. Thyroxine
d. Catecholamines
e. Vasopressin

127. What method of microspecimen staining can be used to detect Mycobacterium tuberculosis?

a. Gram stain
b. Romanowsky-Giemsa stain
c. Burri-Gins stain
d. Ziehl-Nielsen stain
e. Neisser stain

128. What indicator is used in titrimetric determination of substances by means of mercurimetry (complexometry)?

a. Methyl orange
b. Potassium chromate
c. Phenolphthalein
d. Diphenylcarbazide
e. Starch

129. What titrimetric method of analysis can be used for quantification of magnesium chlorides in a mixture that contains both potassium and magnesium chlorides?

a. Mercurometry
b. Argentometry
c. Complexonometry
d. Permanganatometry
e. Nitritometry

130. What is benzene formula?

a. C_6H_10
b. C_6H_6
c. C_10H_8
d. C_4H_4
e. C_6H_8

131. After evaporation of the solution that is being analyzed, the remaining dry residue turns the colorless flame of the burner purple. What ions are present in the solution, as indicated by this reaction?

a. Potassium ions
b. Ammonium ions
c. Barium ions
d. Sodium ions
e. Lithium ions

132. What monomer is the basis for natural rubber?

a. 1-Butyne
b. Isoprene
c. Ethene
d. Divinyl
e. Propene

133. After being stung by bees, the patient developed Quincke's edema. What drug should the patient be urgently administered for the treatment of this condition?

a. Diphenhydramine hydrochloride
b. Atropine sulfate

c. Propranolol hydrochloride
d. Furosemide
e. Adrenaline tartrate

134. Hepatitis B patients and hepatitis B carriers cannot be potential donors, because there is a risk of transmitting the infection to the recipient along with blood and blood products. What transmission route is characteristic of this infection?
a. Airborne-droplet transmission
b. Arthropod-borne transmission
c. Parenteral transmission
d. Airborne-dust transmission
e. Alimentary transmission

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

136. A solution contains aluminum, potassium, and sodium cations. Into this solution a small amount of ammonium hydroxide and alizarin solution was added, resulting in production of a bright red precipitate (varnish). What ion has been detected as the result of this reaction?
a. Calcium
b. Aluminum
c. Barium
d. Potassium
e. Sodium

137. A patient has been hospitalized with the diagnosis of diabetic hyperglycemic coma. The patient's breathing is slow, deep, and noisy. The inhalation phase is longer than the exhalation phase. What type of breathing has developed in the patient?
a. Apneic breathing
b. Cheyne-Stokes breathing
c. Biot breathing
d. Gasping
e. Kussmaul breathing

138. What side effect is characteristic of lisinopril?
a. Orthostatic hypertension
b. Dry cough
c. Hyperglycemia
d. Bronchospasm
e. Red urine

139. In cases of methanol poisoning, one of the treatment methods requires administering ethanol (orally or intravenously) in doses large enough to cause intoxication in a healthy person. Why is this treatment method effective?
a. Ethanol inhibits methanol diffusion
b. Ethanol blocks alcohol dehydrogenase coenzyme
c. Ethanol competes with methanol for the active site of alcohol dehydrogenase
d. Ethanol inactivates alcohol dehydrogenase
e. Ethanol breaks down faster than methanol

140. 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. Creatine
b. Glucose

c. Indican
d. Lactic acid
e. Protein

141. A patient complains of headache episodes with nausea and vomiting. During examination, patient's blood pressure - 180/100 mm Hg, blood glucose levels - 14.8 mmol/L. Magnetic resonance tomography detects pituitary adenoma. What pathology has caused the development of hyperglycemia in this patient?
a. Cushing disease
b. Hypothyroidism
c. Addison disease
d. Diabetes insipidus
e. Pituitary dwarfism

142. What functional groups are present in the cyclic forms of ribose and deoxyribose?
a. Hydroxylic and aldehyde
b. Only aldehyde
c. Only carboxylic
d. Only hydroxylic
e. Hydroxylic and carboxylic

143. When carbohydrate intake is excessive, insulin stimulates conversion of carbohydrates into lipids in the cells of adipose tissue. What biochemical process enables this conversion?
a. Synthesis of higher fatty acids
b. Gluconeogenesis
c. Lipolysis
d. Uric acid synthesis
e. Heme synthesis

144. A patient diagnosed with stomatitis was prescribed a fat-soluble vitamin preparation that takes part in redox processes and accelerates mucosal epithelization. What drug is it?
a. Ergocalciferol
b. Retinol acetate
c. -
d. Ascorbic acid
e. Folic acid

145. What reagent can be used for identification of lead cations according to the State Pharmacopoeia of Ukraine?
a. Urea
b. Sodium hydroxide
c. Potassium iodide
d. Formaldehyde solution
e. Sodium sulfite

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

147. Polarimetry is used for determining optically active substances. What substance can be determined, using this method?
a. Sodium chloride
b. Copper sulfate
c. Calcium nitrate
d. Glucose
e. Potassium iodide

148. What is propene structural formula?

a. -

b. CH_3-CH_2-CH_3

c. CH_3-CH_2-CH=CH-CH_3

d. CH_3-CH=CH_2

e. CH_3-CH=CH-CH_3

149. A doctor prescribed zopiclone to a patient complaining of insomnia. This drug has a hypnotic effect, because it interacts with certain receptors. Name these receptors.

a. H_1- and H_2-histamine receptors

b. Serotonin and opioid receptors

c. Muscarinic and nicotinic acetylcholine receptors

d. alpha- and beta-adrenergic receptors

e. Benzodiazepine and GABA receptors

150. Spore formation helps microbes survive in the environment. What microorganisms are spore formers?

a. Staphylococcus

b. Peptostreptococcus

c. Bacteroides

d. Peptococcus

e. Clostridium