1. What medium is used in quantification of halide ions by means of Volhard method (thiocyanometry)?

a. Phosphate acid
b. Neutral
c. Strongly alkaline
d. Weakly alkaline
e. Nitric acid

2. 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. Nitric oxide
b. Aldosterone
c. Renin
d. Vitamin D
e. Erythropoietin

3. 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. Styloids
c. Globoids
d. Druses
e. Cystoliths

4. What H_2-histamine blocker can be used to treat peptic ulcer disease of the stomach with increased secretory function?

a. Levocetirizine
b. Omeprazole
c. Drotaverine hydrochloride
d. Atropine sulfate
e. Famotidine

5. Berberis vulgaris has spines that are modifications of:

a. Petioles
b. Stems
c. Rachises
d. Stipules
e. Leaves

6. What is the typical sign of the initial stage of acute renal failure?

a. Polyuria
b. Anuria
c. Pollakiuria
d. Dysuria
e. Nocturia

7. The synthesis of thyroid hormones is carried out from tyrosine in a special protein of the thyroid gland. Name this protein.

a. Thyroglobulin
b. Albumin
c. Immunoglobulin
d. Interferon
e. Histone

8. 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. Sarcina
b. Pseudomonas aeruginosa

c. Micrococci
d. Tetracocci
e. Lactobacilli

9. What method of microspecimen staining can be used to detect Mycobacterium tuberculosis?
a. Burri-Gins stain
b. Gram stain
c. Neisser stain
d. Ziehl-Nielsen stain
e. Romanowsky-Giemsa stain

10. 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. Circulatory hypoxia
b. Hemic hypoxia
c. Respiratory hypoxia
d. Hypoxic hypoxia
e. Tissue hypoxia

11. What adsorption indicator is used in quantification of iodides by means of the Fajans method?
a. Methyl orange
b. Eosin
c. Diphenylamine
d. Murexide
e. Phenolphthalein

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

13. 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. Muscarinic and nicotinic acetylcholine receptors
b. H_1- and H_2-histamine receptors
c. Serotonin and opioid receptors
d. Benzodiazepine and GABA receptors
e. alpha- and beta-adrenergic receptors

14. What electrode can be used as an indicator electrode in titration of bases?
a. Quinhydrone electrode
b. Silver chloride electrode
c. Calomel electrode
d. Platinum electrode
e. Glass electrode

15. 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. Diabetes insipidus
b. Pituitary dwarfism
c. Hypothyroidism
d. Cushing disease
e. Addison disease

16. Species pectorales herbal tea contains pieces of bright yellow, sweet-tasting roots. What medicinal plant is it?

a. Glycyrrhiza glabra
b. Althaea officinalis
c. Valeriana officinalis
d. Plantago major
e. Acorus calamus

17. What type of chromatography includes the gas-liquid chromatography?

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

18. What compound contains a primary aromatic amino group?

a. (C_6H_5)_3N (triphenylamine)
b. (CH_3)_2NH (dimethylamine)
c. (CH_3)_3N (trimethylamine)
d. (CH_3)_3C-NH_2 (tert-butylamine)
e. C_6H_5-NH_2 (aniline)

19. What specific reagent is used for identification of Fe^2+ cations?

a. K_2Na[Co(NO_2)_6]
b. NH_4OH
c. NaOH
d. K_3[Fe(CN)_6]
e. H_2SO_4

20. What antiprotozoal drug has anti-Helicobacter pylori effect?

a. Rifampicin
b. Metronidazole
c. Albendazole
d. -
e. Isoniazid

21. A 65-year-old man developed third-degree atrioventricular block. What medicine should be prescribed for this patient?

a. Amiodarone hydrochloride
b. Atropine sulfate
c. Verapamil hydrochloride
d. Metoprolol
e. Digoxin

22. What type of pharmaceutical interaction is it, when absorption of tetracycline drugs becomes reduced if they are taken simultaneously with antacids?

a. Synergism
b. Functional antagonism
c. Pharmacodynamic incompatibility
d. Pharmacokinetic incompatibility
e. Pharmaceutical incompatibility

23. 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. Scattering
b. Fluorescence
c. Opalescence
d. Chemiluminescence
e. Emission

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

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

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

26. 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. Clay dispersions
b. Foams
c. Solutions of high-molecular compounds
d. Surfactant solutions
e. Tannin solutions

27. What anticholinesterase agent can be used to stimulate intestinal peristalsis in the patients during the postoperative period?

a. Metoprolol
b. Salbutamol
c. Suxamethonium chloride
d. Neostigmine methylsulfate
e. Adrenaline tartrate

28. 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. Chronic lymphocytic leukemia
b. Lymphogranulomatosis
c. Multiple myeloma
d. Chronic myeloid leukemia
e. Agranulocytosis

29. 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. Protozoa
b. Actinomycetes
c. Bacteria
d. Viruses
e. Fungi

30. What side effect is characteristic of lisinopril?

a. Hyperglycemia
b. Bronchospasm
c. Orthostatic hypertension
d. Red urine
e. Dry cough

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

a. Acetyl-CoA
b. Propionyl-CoA
c. Palmitoyl-CoA
d. Acetoacetyl-CoA
e. Stearoyl-CoA

32. 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. Ovate
b. Narrowly ovate
c. Linear
d. Lanceolate
e. Elliptic

33. 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 competes with methanol for the active site of alcohol dehydrogenase
c. Ethanol breaks down faster than methanol
d. Ethanol blocks alcohol dehydrogenase coenzyme
e. Ethanol inactivates alcohol dehydrogenase

34. 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. Peptidyl transferase
b. RNA polymerase
c. Topoisomerase
d. Aminoacyl-tRNA synthetase
e. Reverse transcriptase

35. 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. Solanaceae
b. Asteraceae
c. Scrophylariaceae
d. Rosaceae
e. Lamiaceae

36. What group reagent can be used to separate group III cations (acid-base classification), when conducting systematic analysis of a mixture?

a. Sulfuric acid
b. Barium chloride
c. Hydrochloric acid
d. Alkali and hydrogen peroxide
e. Ammonia

37. What is the name of the five-membered heterocycle that contains nitrogen heteroatoms of the pyrrole and pyridine type?

a. Triazole
b. Thiazole
c. Pyrazolidine
d. Piperidine
e. Pyrazole

38. 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. Heme synthesis
c. Gluconeogenesis
d. Lipolysis
e. Uric acid synthesis

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

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

41. 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. Immunoglobulin
b. Killed vaccine
c. Antitoxic serum
d. Anatoxin
e. Adjuvant

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

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

44. 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. Cl^-
b. NH_4^+
c. CO_3^2-
d. Bi^3+
e. Pb^2+

45. 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

46. 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. Anisochromia
b. Reticulocytosis
c. Anisocytosis
d. Hypochromia
e. Poikilocytosis

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

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

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

50. 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. Reaches its maximum and then decreases
d. Remains unchanged
e. Increases

51. 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. Brassicaceae
e. Fabaceae

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. $MgCl_2$
b. $CaCO_3$
c. $AlBr_3$
d. $C_6H_{12}O_6$
e. LiCl

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

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

54. 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. Alimentary transmission
b. Airborne-droplet transmission
c. Arthropod-borne transmission
d. Parenteral transmission
e. Airborne-dust transmission

55. 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. alpha-adrenergic receptors
b. beta-adrenergic receptors
c. Muscarinic acetylcholine receptors
d. Nicotinic acetylcholine receptors
e. Angiotensin receptors

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

a. Increasing the cell membrane permeability
b. Blockade of cell wall synthesis
c. Inhibition of nucleic acid synthesis
d. Inhibition of protein synthesis
e. Antagonism with para-aminobenzoic acid

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

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

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

a. Peptostreptococcus
b. Staphylococcus
c. Bacteroides
d. Peptococcus
e. Clostridium

59. 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. Furosemide
b. Diphenhydramine hydrochloride
c. Adrenaline tartrate
d. Atropine sulfate
e. Propranolol hydrochloride

60. A 65-year-old man has been diagnosed with benign prostatic hyperplasia. What adrenoblocker should he be prescribed?

a. -
b. Adrenaline tartrate

c. Doxazosin mesylate
d. Metoprolol
e. Propranolol hydrochloride

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

62. 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. Almagel
b. Pancreatin
c. Bisacodyl
d. -
e. Drotaverine hydrochloride

63. 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. Retinol acetate
b. Folic acid
c. -
d. Ergocalciferol
e. Ascorbic acid

64. 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 oxygen consumption and activation of ATP synthesis
b. Decreased oxygen consumption and inhibition of ATP synthesis
c. Increased use of ATP for cAMP synthesis
d. Decreased ATP synthesis and energy release in the form of heat
e. Increased acetyl-CoA levels and stimulation of tricarboxylic acid cycle

65. 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. Protein
d. Lactic acid
e. Indican

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

67. 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. Corymb
b. Spike
c. Umbel

d. Botryoid
e. Flat capitulum

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

69. 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

70. 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. Lamiaceae
c. Brassicaceae
d. Rosaceae
e. Fabaceae

71. 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. Insulinoma
b. Thyrotoxicosis
c. Acromegaly
d. Cushing disease
e. Pheochromocytoma

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

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

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

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

76. 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. Albendazole
b. Fluconazole
c. Metronidazole
d. Clarithromycin
e. Acyclovir

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

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

79. 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. Borrelia recurrentis
b. Salmonella typhi
c. Streptococcus pyogenes
d. Bacillus subtilis
e. Yersinia pestis

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

81. 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. Strengthening plasma protein binding
b. Intensifying breakdown and absorption in the stomach
c. Preventing binding to the target receptor
d. Increasing lipophilicity to improve absorption
e. Increasing water solubility for renal excretion

82. A patient was prescribed losartan potassium for treatment of arterial hypertension. What is the mechanism of action of this drug?
a. Calcium channel block
b. Activation of central alpha-adrenergic receptors

c. Blockade of angiotensin receptors
d. Inhibition of phosphodiesterase
e. Inhibition of angiotensin-converting enzyme

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

84. 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. Proteus vulgaris
b. E) coli
c. Salmonella typhimurium
d. Neisseria
e. S. aureus

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

86. 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. 0
c. 150
d. 50
e. 25

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

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

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

90. 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. Inhibition of biotransformation
b. Weakening of the absorption process
c. Acceleration of biotransformation
d. Accumulation of the substance in the body
e. Increased sensitivity of receptors

91. 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. Glaucine hydrochloride
b. Mucaltin
c. Acetylcysteine
d. Ambroxol hydrochloride
e. Bromhexine hydrochloride

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

93. What is benzene formula?
a. C_6H_10
b. C_6H_6
c. C_10H_8
d. C_6H_8
e. C_4H_4

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

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

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

97. What is the structural formula for 3-chloropropene?
a. ClCH_2-CH=CH_2
b. ClCH_2-CH=CH-CH_3
c. CH_2=CCl-CH_3
d. ClCH=CH-CH_3
e. CH_2=CH-CH=CHCl

98. 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. Eosinophilia
b. Monocytosis
c. Neutrophilia
d. Basophilia
e. Lymphocytosis

99. What product forms as a result of aldehydes and ketones reacting with primary amines?
a. Thiol
b. Diazine
c. Nitrile
d. Alcohol
e. Azomethine

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

101. What value is used when calculating the osmotic pressure of electrolyte solutions according to the Van 't Hoff's law?
a. Osmotic coefficient
b. Activity coefficient
c. Isotonic coefficient
d. Ebullioscopic constant
e. Cryoscopic constant

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

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

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

105. 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. Propranolol hydrochloride
b. Verapamil hydrochloride
c. -
d. Glycerol trinitrate
e. Digoxin

106. 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. Meristematic tissue
d. Mechanical tissue
e. Parenchyma

107. What titrants are used in quantification of iodides by means of back titration, using the Volhard method?

a. Silver nitrate, sodium chloride
b. Mercury(I) nitrate, ammonium thiocyanate
c. Mercury(I) nitrate, potassium thiocyanate
d. Mercury(II) nitrate, ammonium thiocyanate
e. Silver nitrate, ammonium thiocyanate

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

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

109. 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. Aluminum cations
b. Calcium cations
c. Cobalt cations
d. Copper cations
e. Nickel cations

110. 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. Sedative
c. Potassium-sparing
d. Antispasmodic
e. Analgesic

111. 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. Airborne and droplet transmission
c. Fecal-oral transmission
d. Indirect contact transmission
e. Arthropod-borne transmission

112. What method of chromatographic analysis can be used for separation, identification, and quantification of methanol and ethanol in a mixture?

a. Planar chromatography
b. Paper chromatography
c. Precipitation chromatography
d. Gas-liquid chromatography
e. Ion exchange chromatography

113. What titrimetric method of analysis can be used for quantification of magnesium chlorides in a mixture that contains both potassium and magnesium chlorides?
a. Permanganatometry
b. Mercurometry
c. Nitritometry
d. Argentometry
e. Complexonometry

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

115. A patient diagnosed with arterial hypertension has been prescribed a drug with an antihypertensive, antianginal, and antiarrhythmic effect. Name this drug.
a. Dopamine hydrochloride
b. Metoprolol
c. Fenoterol
d. Clonidine
e. Adrenaline tartrate

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

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

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

119. 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. Diabetes mellitus
b. Nephrogenic diabetes insipidus

c. Kidney failure
d. Insulinoma
e. Diabetes insipidus

120. 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. Kidneys
b. Skeletal muscles
c. Liver
d. Adrenal glands
e. Heart muscle

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

122. 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. Hydathodes
b. Emergences
c. Osmophores
d. Idioblasts
e. Laticifers

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

124. Urinalysis of a patient with diabetes mellitus detects glucosuria. What is the renal threshold for glucose reabsorption?
a. 5 mmol/L
b. 15 mmol/L
c. 1 mmol/L
d. 20 mmol/L
e. 10 mmol/L

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

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

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

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

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

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

130. A patient has pulmonary edema. What drug must be prescribed in this case to reduce the volume of circulating blood?

a. Verapamil hydrochloride
b. Magnesium sulfate
c. Furosemide
d. Amiodarone hydrochloride
e. Metoprolol

131. What law underlies the method of spectrophotometry in the ultraviolet region of the spectrum?

a. Faraday law
b. Stokes-Lommel law
c. Beer-Bouguer-Lambert law
d. Ohm law
e. Rayleigh law

132. Which one of the listed heterocyclic compounds exhibits the strongest basic properties?

a. Thiophene
b. Pyridine
c. Pyrrolidine
d. Furan
e. Pyrrole

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

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

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

136. What monomer is the basis for natural rubber?
a. Ethene
b. Propene
c. Isoprene
d. Divinyl
e. 1-Butyne

137. 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. Barium
b. Calcium
c. Potassium
d. Aluminum
e. Sodium

138. 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. Biot breathing
b. Kussmaul breathing
c. Cheyne-Stokes breathing
d. Gasping
e. Apneic breathing

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

140. What is propene structural formula?
a. -
b. CH_3-CH=CH_2
c. CH_3-CH=CH-CH_3
d. CH_3-CH_2-CH=CH-CH_3
e. CH_3-CH_2-CH_3

141. What inflorescences are most typical of the Brassicaceae family?
a. Compound corymb, compound umbel
b. Round or flat capitulum
c. Spadix, spike

d. Raceme, panicle
e. Corymb, umbel

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

143. 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. Chloride anions
b. Sulfate anions
c. Carbonate anions
d. Nitrate anions
e. Phosphate anions

144. 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. Chelidonium majus
b. Achillea millefolium
c. Artemisia absinthium
d. Bidens tripartita
e. Urtica dioica

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

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

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

148. 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. Blastopathy
b. Fetopathy
c. Molecular genetics disease
d. Chromosome abnormality

e. Gametopathy

149. What is characteristic of benign tumors?

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

150. 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. Angina pectoris
b. Pulmonary embolism
c. Myocardial infarction
d. Myocarditis
e. Pericarditis