1. What enzyme is used to synthesize genes from matrix RNA on DNA in RNA-containing viruses?

a. Reverse transcriptase

b. Endonuclease

c. DNA ligase

d. Exonuclease

e. Helicase

2. 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. Clonidine

d. Fenoterol

e. Adrenaline tartrate

3. During practice, a student was tasked with classifying plants, dividing them into monocotyledons and dicotyledons. What family of plants belongs to the monocotyledons?

a. Lamiaceae

b. Fabaceae

c. Poaceae

d. Rosaceae

e. Brassicaceae

4. 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. 3.5% NaCl solution

d. Distilled water

e. 3.5% glucose solution

5. 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-dust transmission

b. Parenteral transmission

c. Arthropod-borne transmission

d. Alimentary transmission

e. Airborne-droplet transmission

6. What compound is a base for organic dyes and belongs to isolated polynuclear arenes?

a. Benzene

b. Phenanthrene

c. Anthracene

d. Triphenylmethane

e. Cumene

7. 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. Acyclovir

b. Albendazole

c. Metronidazole

d. Fluconazole

e. Clarithromycin

8. Microscopy of a rhizome detects periphloematic vascular bundles. What plant does this rhizome belong to?

a. Acorus calamus

b. Elymus repens
c. Dryopteris filix-mas
d. Potentilla erecta
e. Convallaria majalis

9. 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. Lamiaceae
c. Asteraceae
d. Rosaceae
e. Solanaceae

10. 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. Ascorbic acid
c. -
d. Folic acid
e. Retinol acetate

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

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

13. 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. Toluene
c. Benzene
d. Phenol
e. Naphthalene

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

15. 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. Fungi
c. Bacteria
d. Viruses
e. Protozoa

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

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

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

19. 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. Umbel
b. Botryoid
c. Flat capitulum
d. Spike
e. Corymb

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

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

22. 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. Basophilia

c. Neutrophilia
d. Monocytosis
e. Lymphocytosis

23. 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. Indirect contact transmission
d. Arthropod-borne transmission
e. Fecal-oral transmission

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

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

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

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

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

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

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

31. What method of instrumental analysis can be used for quantification of hydrochloric and boric acids in a mixture?

a. Infrared spectroscopy
b. Chromatography
c. Spectrophotometry
d. Potentiometry
e. Polarimetry

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

33. 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 peroxide compounds of these cations
b. For more complete precipitation of these cations
c. For formation of hydroxo- and oxoanions of these elements at the highest oxidation degrees
d. For destruction of hydrate complexes
e. For formation of hydroxo- and oxoanions of these elements at the lowest oxidation degrees

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

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

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

36. A plant is completely submerged in water. What ecological group does this plant belong to?

a. Mesophytes
b. Hydrophytes
c. Xerophytes
d. Hygrophytes
e. Succulents

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

a. Mercury(II) nitrate, ammonium thiocyanate

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

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

39. 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. Erythropoietin
d. Vitamin D
e. Renin

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

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

42. 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. Potassium
d. Sodium
e. Barium

43. 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. Sodium ions
d. Barium ions
e. Lithium ions

44. What value is used when calculating the osmotic pressure of electrolyte solutions according to the Van 't Hoff's law?
a. Cryoscopic constant
b. Ebullioscopic constant

c. Osmotic coefficient
d. Activity coefficient
e. Isotonic coefficient

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

46. 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. -
c. Verapamil hydrochloride
d. Digoxin
e. Glycerol trinitrate

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

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

49. 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. Cheyne-Stokes breathing
c. Gasping
d. Kussmaul breathing
e. Apneic breathing

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

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

52. 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. Vitamin B_12
c. Copper
d. Hemosiderin
e. Folic acid

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

54. 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. Diabetes insipidus
c. Addison disease
d. Pituitary dwarfism
e. Hypothyroidism

55. 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. LiCl
b. C_6H_12O_6
c. MgCl_2
d. CaCO_3
e. AlBr_3

56. Primary and secondary nitroalkanes are tautomeric compounds. What tautomerism is characteristic of these compounds?

a. Aci-nitro tautomerism
b. Keto-enol tautomerism
c. Amino-imino tautomerism
d. Tautomerism of azoles
e. Lactam-lactim tautomerism

57. What is benzene formula?

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

58. What principle is used when calculating the phase transition temperature at different pressure?

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

59. 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. Increased enzyme activity due to increased molecular motion
b. Minor changes in enzyme activity due to enzyme thermostability
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

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

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

62. 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. Micrococci
c. Pseudomonas aeruginosa
d. Lactobacilli
e. Tetracocci

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

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

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

66. What group of broncholytics is used for treatment of patients with bronchial asthma?
a. Muscarinic agonists
b. Anticholinesterase drugs
c. beta_2-adrenergic agonists
d. Nicotinic agonists
e. beta-adrenergic blockers

67. 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 enter into a chemical reaction with the solvent
b. Solvents must have similar polarity values
c. The substance must have different solubility in two different solvents
d. Solvents must be miscible with each other
e. The extraction process must be carried out at a high temperature

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

69. What side effect is characteristic of lisinopril?

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

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

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

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

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

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

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

a. Peptostreptococcus

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

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

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

77. 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. Althaea officinalis
c. Chelidonium majus
d. Taraxacum officinale
e. Vinca minor

78. 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. Heart muscle
c. Skeletal muscles
d. Liver
e. Adrenal glands

79. 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. Pasteurization
c. Autoclaving
d. Flame sterilization
e. Tyndallization

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

81. 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. 50

b. 0
c. 100
d. 25
e. 150

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

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

84. What indicator is used in titrimetric determination of substances by means of mercurimetry (complexometry)?
a. Starch
b. Methyl orange
c. Potassium chromate
d. Diphenylcarbazide
e. Phenolphthalein

85. 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. Prednisolone
d. -
e. Acetylsalicylic acid

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

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

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

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

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

91. What feature of a leaf is characteristic of Poaceae?

a. Ochrea
b. Petiole
c. Leaf blade
d. Stipules
e. Leaf sheath

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

93. What amine causes a positive isonitrile reaction?

a. N,N-Dimethylamine
b. Tetramethylammonium chloride
c. Diethylamine
d. Diphenylamine
e. Benzylamine

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

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

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

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

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

98. 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. Isomerases
c. Oxidoreductases
d. Lyases
e. Ligases

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

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

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

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

103. Allopurinol is used to reduce the formation of uric acid in the treatment of gout. What enzyme is inhibited by this medicine?
a. Lactate dehydrogenase
b. Catalase

c. Amylase
d. Arginase
e. Xanthine oxidase

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

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

106. 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. Brassicaceae
b. Fabaceae
c. Rosaceae
d. Lamiaceae
e. Ericaceae

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

108. 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. Gluconeogenesis
b. Synthesis of higher fatty acids
c. Heme synthesis
d. Lipolysis
e. Uric acid synthesis

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

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

111. What is the structural formula for 3-chloropropene?
a. ClCH_2-CH=CH_2

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

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

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

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

115. Administration of adrenaline increases glucose levels in the blood. What process is mainly activated in this case?
a. Gluconeogenesis
b. Lipogenesis
c. Glycogenolysis
d. Glycogenesis
e. Pentose phosphate pathway

116. 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. Argentometry
c. Nitritometry
d. Mercurometry
e. Complexonometry

117. 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. Chromosome abnormality
b. Fetopathy
c. Molecular genetics disease
d. Gametopathy
e. Blastopathy

118. What is characteristic of benign tumors?
a. Metastasis
b. Expansive growth
c. Invasion into the surrounding tissues
d. Cancer cachexia
e. Infiltrating growth

119. 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. Decreased oxygen consumption and inhibition of ATP synthesis

b. Decreased ATP synthesis and energy release in the form of heat

c. Increased use of ATP for cAMP synthesis

d. Increased acetyl-CoA levels and stimulation of tricarboxylic acid cycle

e. Increased oxygen consumption and activation of ATP synthesis

120. What titrimetric methods can be used for quantification of streptocide (sulfanilamide, a primary aromatic amine) in a drug?

a. Permanganometry, bromatometry

b. Nitritometry, argentometry

c. Bromatometry, complexonometry

d. Bromatometry, nitritometry

e. Complexonometry, nitritometry

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

a. Albumin

b. Immunoglobulin

c. Thyroglobulin

d. Interferon

e. Histone

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

a. Eosin

b. Phenolphthalein

c. Methyl orange

d. Diphenylamine

e. Murexide

123. What reagent can be used for identification of lead cations according to the State Pharmacopoeia of Ukraine?

a. Potassium iodide

b. Urea

c. Sodium hydroxide

d. Sodium sulfite

e. Formaldehyde solution

124. 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. Gasping

c. Inspiratory dyspnea

d. Biot's breathing

e. Expiratory dyspnea

125. Berberis vulgaris has spines that are modifications of:

a. Petioles

b. Leaves

c. Stems

d. Stipules

e. Rachises

126. What pair of compounds can be distinguished from each other using the silver mirror reaction?

a. 1,3-Butadiene and 1,2-butadiene

b. Propane and propene
c. n-Butane and isobutane
d. Propanal and propanone
e. Ethanol and ethylene glycol

127. 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. Insulinoma
d. Kidney failure
e. Diabetes insipidus

128. 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. Drotaverine hydrochloride
c. Pancreatin
d. -
e. Bisacodyl

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

130. 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. Cushing disease
c. Pheochromocytoma
d. Thyrotoxicosis
e. Insulinoma

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

132. 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. Myocarditis
c. Pulmonary embolism
d. Myocardial infarction
e. Pericarditis

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

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

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

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

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

136. After examination, a child was diagnosed with scarlet fever. What microorganism is the causative agent of this disease?

a. Meningococcus
b. Staphylococcus
c. Actinomycete
d. Klebsiella
e. Streptococcus

137. 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. Opalescence
c. Emission
d. Fluorescence
e. Chemiluminescence

138. 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. Bromoderivative of D-glucose
d. D-Gluconic acid
e. D-Glucuronic acid

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

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

140. 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. RNA polymerase
c. Reverse transcriptase
d. Topoisomerase
e. Peptidyl transferase

141. 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. Analgesic
e. Antispasmodic

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

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

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

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

146. 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)

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

148. What is propene structural formula?

a. CH_3-CH=CH-CH_3

b. CH_3-CH=CH_2

c. CH_3-CH_2-CH=CH-CH_3

d. CH_3-CH_2-CH_3

e. -

149. What is the effect of electron-accepting substituents (type II substituents) on the course of electrophilic substitution (SE) reactions in arenes?

a. They have no effect on the reaction

b. They slow down the reaction and are ortho- and para-directors

c. They speed up the reaction and are meta-directors

d. They slow down the reaction and are meta-directors

e. They speed up the reaction and are ortho- and para-directors

150. 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. Catecholamines

b. Aldosterone

c. Vasopressin

d. Glucocorticoids

e. Thyroxine