1. A patient has been diagnosed with acute pancreatitis. For diagnostic purposes, it is necessary to measure the activity of a certain enzyme in the patient's blood. What enzyme is it?
a. Aldolase
b. Lactate dehydrogenase
c. Pepsin
d. Creatine kinase
e. Amylase

2. During examination it appeared that the patient's sclera and oral mucosa are icteric. What biochemical blood value can be expected to be increased?
a. Bilirubin
b. Cholesterol
c. Albumin
d. Amylase
e. Glucose

3. What titrimetric method of analysis uses both external and internal indicators?
a. Permanganatometry
b. Nitritometry
c. Argentometry
d. Complexonometry
e. Alkalimetry

4. Hyperlipemia can be observed in 2--3 hours after eating fatty food. 9 hours later lipid content normalizes again. How can this condition be characterized?
a. Transport hyperlipemia
b. Hyperplastic obesity
c. Hypertrophic obesity
d. Retention hyperlipemia
e. Alimentary hyperlipemia

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

6. Select a nucleophile among the particles and molecules given below.
a. AlCl_3
b. CH_3Cl
c. ddotNH_3
d. NO_2^+
e. H^+

7. A woman in the state of ketoacidotic coma has loud rapid respiration: a labored expiration with active participation of expiratory muscles occurs after a deep inspiration. What type of pathological respiration is it?
a. Biot
b. Kussmaul
c. Stenotic
d. Gasping
e. Cheyne-Stokes

8. Various types of immunobiological agents are used for immunoprophylaxis of infectious diseases. What type of prophylaxis involves the use of immune sera and gamma globulins?
a. Specific passive
b. General
c. Immunotropic

d. Non-specific
e. Specific active

9. In order to facilitate usage and achievement of necessary therapeutic effect, the drug or medicinal plant material is given a certain dosage form. Indicate the dosage form in the form of a free-disperse system:
a. Emulsion
b. Jelly
c. Gel
d. Membrane
e. Diaphragm

10. A patient with gout has been prescribed allopurinol. What is the mechanism of action of this drug?
a. Stimulation of uric acid breakdown
b. Intensification of uric acid excretion by the kidneys
c. Activation of microsomal oxidation in the liver
d. Inhibition of xanthine oxidase enzyme, inhibition of uric acid synthesis
e. Inhibition of COX-2 enzyme

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

12. What cations belong to the IV analytical group according to the acid-base classification?
a. Magnesium, calcium, strontium, barium
b. Silver, lead, nickel, potassium, barium, bismuth
c. Aluminum, zinc, chromium(II), tin(II), tin(IV), arsenic(III), arsenic(V)
d. Calcium, strontium, barium, potassium, bismuth
e. Sodium, potassium, ammonium, silver, lead

13. A 50-year-old patient in a poor condition was presented to the hospital. Objectively, the skin and visible mucous membranes are cyanotic, arterial blood saturation --- 88%, NiBP --- 90/60 mm Hg, pulse is 117 per minute, respiratory rate is 22 per minute. From the history it is known that the patient suffers from chronic heart failure. Which of the following types of hypoxia is most likely to develop in this case?
a. Anemic
b. Circulatory
c. Hypoxic
d. Hemic
e. Tissue

14. Для представників якої родини характерні такі ознаки: плівчасті прилистки зростаються в розтруб, плід псевдомонокарпний горіхоподібний?
a. Brassicaceae
b. Lamiaceae
c. Fabaceae
d. Polygonaceae
e. Rosaceae

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

e. Primary

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

17. In the course of an experiment in the mesenteric vein of a toad a trombus was created with a crystal of common salt. What processes occurred during the first stage of trombus formation?
a. Production of thrombin
b. Production of fibrin polymer
c. Production of fibrin monomer
d. Adhesion, aggregation, agglutination of platelets
e. Production of active thromboplastin

18. The researcher while conducting the qualitative analysis that involves sulfates precipitation of the third analytical group cations (Ca^{2+, Sr^{2+, Ba^{2+) has to reduce solubility of sulfates. What substance should he use for this purpose?
a. Ethyl alcohol
b. Chloroform
c. Distilled water
d. Amyl alcohol
e. Benzene

19. In cases of severe pancreatitis, physicians usually prescribe the drugs that help prevent pancreatic autolysis. These drugs inhibit the following type of enzymes:
a. Proteases
b. Amylases
c. Dehydrogenases
d. Phosphatases
e. Lipases

20. Sclerenchyma fibers, formed by procambium or parenchyma around vascular bundles or secretory cavities, strengthen and protect them. What type of fibers is it?
a. Xylem fibers
b. Perivascular fibers
c. Pericyclic fibers
d. Phloem fibers
e. Cortical fibers

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

22. During the analysis of the cations that belong to the fourth analytical group (acid-base classification), their processing with a group reagent makes it possible not only to separate, but also to identify the following ions:
a. Zn(II) ions
b. Cr(III) ions
c. Sn(IV) ions
d. Al(III) ions
e. As(III) ions

23. A patient has been warned that the medicine prescribed to him can cause a cough. Name this medicine:
a. Metoprolol
b. Phenyhydin (Nifedipine)
c. Dichlothiazide (Hydrochlorothiazide)
d. Lisinopril
e. Clophelin (Clonidine)

24. On X-ray examination of the 59-year-old patient, in the lower lobe of the right lung there was detected a distinct shadow, differential for tumor. It was pre-determined that the tumor is benign. Which of the following features characterizes the tumor as benign?
a. Expansive growth
b. Invasion in surrounding tissues
c. Infiltrating growth
d. Cancer cachexia
e. Metastasis

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

26. An analytical chemist conducts a qualitative analysis of cations of the second group. What reagent can be used to separate lead chloride from chlorides of other cations of the second group?
a. Hydrochloric acid
b. Ammonia
c. Sodium chloride
d. Hot water
e. Sodium hydroxide

27. In redox titrimetry, the indicators that are added to the reaction system respond to the changes in the:
a. Redox potential of the system
b. Concentration of hydrogen ions
c. Degree of ionization of the substance being analyzed
d. Concentration of hydroxyl ions
e. Ionic strength of the solution

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

29. A patient, who was prescribed famotidine for peptic ulcer disease, came to a pharmacy. What mechanism underlies the action of this medicine?
a. Cholinergic receptors blockade in the sympathetic ganglia
b. Muscarinic cholinoreceptor blockade
c. H_2-histamine receptors blockade
d. Inhibition of the H^+K^+ ATPase activity
e. H_1-histamine receptors blockade

30. What pair of compounds can be classified as functional group isomers?
a. Benzene and methylbenzene

b. Propanal and propanone
c. Hexane and cyclohexane
d. Butane and isobutane
e. Pentene-1 and pentene-2

31. A solution contains calcium, barium, aluminium, potassium, and sodium cations. Into this solution a small amount of ammonium hydroxide and alizarin solution was added, which resulted in production of red precipitate. What ion was detected as the result of this reaction?
a. Sodium
b. Aluminium
c. Calcium
d. Barium
e. Potassium

32. What drug should not be prescribed for the treatment of arterial hypertension in a patient with gout?
a. Amlodipine
b. Atenolol
c. Enalapril
d. Cozaar (Losartan)
e. Hydrochlorothiazide

33. Який препарат із групи психотропних засобів блокує дофамінові рецептори?
a. Діазепам
b. Анальгін (метамізол натрію)
c. Аміназин (хлорпромазин)
d. Кофеїн-бензоат натрію
e. Амітриптилін

34. The third analitycal group of cations (acid-base classification) includes Ca^{2+, Sr^{2+, Ba^{2+. What acid can function as a precipitator agent (group reagent) for these cations?
a. $HClO_4$
b. HNO_3
c. HCl
d. H_2SO_4
e. CH_3COOH

35. What hormonal drug is used in cases of atonic uterine bleeding?
a. Oxytocin
b. Prednisolone
c. Progesterone
d. L-thyroxine
e. Insulin

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

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

38. What is the vapor pressure of a liquid at its boiling point?
a. Minimum
b. Equal to saturated vapor pressure at room temperature
c. Equal to atmospheric pressure
d. Maximum
e. Equal to saturated vapor pressure at 273 K

39. Many serological reactions require strictly aseptic conditions. What method of sterilization is optimal for decontamination of laboratory glassware?
a. Pasteurization
b. Tyndallization
c. Filtration
d. Dry heat
e. Calcination

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

41. A patient with Cushing syndrome has persistent hyper- \\ glycemia and glucosuria. In this case, increased synthesis and secretion of a certain hormone can be observed. What hormone is it?
a. Glucagon
b. Cortisol
c. Insulin
d. Adrenaline
e. Thyroxine

42. What enzyme allows for synthesys of various genes from template RNA to DNA in genetic engineering (this enzyme catalyzes the process observed in RNA-viruses)?
a. DNA-ligase
b. Exonuclease
c. Endonuclease
d. Reverse transcriptase
e. Helicase

43. Який вид лікарських речовин належить до групи бур'янів?
a. Mentha piperita
b. Salvia officinalis
c. Papaver somniferum
d. Plantago major
e. Convallaria majalis

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

45. What reagents produce a reaction that follows the free radical (SR) mechanism?
a. Ethylene and chlorine
b. Benzene and chlorine in the presence of $AlCl_3$
c. Ethane and chlorine in the light

d. Ethane and oxygen
e. Ethanol and hydrogen chloride

46. Streptomycin like other aminoglycosides, by binding to the 30S subunit of ribosomes, prevents the attachment of formylmethionyl-tRNA) What process is being disrupted as a result of this effect?
a. Transcription termination
b. Translation termination
c. Transcription initiation
d. Translation initiation
e. Replication initiation

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

48. CH_3-CH_2-OH and CH_3-O-CH_3 are a pair of compounds that can be classified as isomers of the following type:
a. Geometric (cis-trans) isomers
b. Functional group isomers
c. Carbon chain isomers
d. Mirror (optical) isomers
e. Tautomers

49. What adsorbent is used as a suspension to relieve the intoxication caused by alkaloid poisoning?
a. Starch
b. Activated charcoal
c. Kaolin
d. Bentonite
e. Silica gel

50. Proteins are the catalysts of biochemical processes. What type of homogeneous catalysis includes the processes with their participation?
a. Enzyme catalysis
b. Redox catalysis
c. Gas-phase homogeneous catalysis
d. Coordination catalysis
e. Acid-base catalysis

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

52. Corolla of a zygomorphic hermaphroditic flower consists of 5 petals: the largest one is called the banner, the two lateral petals are called the wings, and the two fused petals are forming the keel. Such corolla is characteristic of medicinal plants of Leguminosae family. Name the type of corolla:
a. Papilionaceous
b. Labiate
c. Saucer-shaped
d. Tubular
e. Funnelform

53. What type of fruit is characteristic of Atropa belladonna?
a. Silique
b. Hesperidium
c. Legume
d. Berry
e. Capsule

54. In the process of asexual reproduction, higher spore-forming plants have the ability to form spores, which is an adaptation to life on dry land. What set of chromosomes do their spores have?
a. Tetraploid
b. Diploid
c. Triploid
d. Haploid
e. Polyploid

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

56. A patient with gingivitis was prescribed oral cavity irrigation with 0.02% potassium permanganate solution. What group of antiseptics does this drug belong to?
a. Detergents
b. Oxidants
c. Alcohols
d. Nitrofurans
e. Dyes

57. What transformation is accompanied by an increase in entropy?
a. C_2H_2(gas) + H_2(gas) = C_2H_4(gas)
b. CaO(solid) + CO_2(gas) = CaCO_3(solid)
c. NH_4-NO_2-(solid) = N_2(gas) + 2H_2O(gas)
d. 2H_2S (gas) + 3O_2(gas) = 2SO_2(gas) + 2H_2O(gas)
e. N_2(gas) + O_2(gas) = 2NO(gas)

58. A patient, who has been suffering from chronic glomerulonephritis for the last 4 years, presents with a large amount of protein (4g/L) that appeared in the urinalysis. The levels of triglycerides and cholesterol increased in the patient's blood. What syndrome has complicated the course of the main disease in this case?
a. Hypertensive
b. Nephrotic
c. Asthenic
d. Inflammatory
e. Toxic

59. What cardiac glycoside is obtained from lily of the valley?
a. Adoniside
b. Digitoxin
c. Celanid (Lanatoside C)
d. Strophanthin K
e. Corglycon

60. For tetanus prevention, a toxin that has been neutralized with formalin (0.4%) at the temperature of 39°C for four weeks is used. What kind of preparation is it?
a. Immunoglobulin
b. Anatoxin
c. Adjuvant

d. Inactivated vaccine
e. Antitoxic serum

61. What parameter takes into account the deviation of the properties of a real solution from an ideal one?
a. Degree of dissociation
b. Isotonic coefficient
c. Activity
d. Fugacity
e. Concentration

62. Helmholtz energy is the direction criterion of an arbitrary process at a constant:
a. Temperature and pressure
b. Internal energy and volume
c. Entropy and pressure
d. Entropy and volume
e. Temperature and volume

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

64. In the roots of primary structure, the nutrient reserves are stored in the:
a. Central axial cylinder
b. Pericycle
c. Mesodermis
d. Endodermis
e. Exodermis

65. Surfactants are compounds that lower the surface tension (or interfacial tension) between two liquids, between a gas and a liquid, or between a liquid and a solid. Which of the following substances exhibits the properties of a surfactant at the air-water interface?
a. $NaOH$
b. HCl
c. ---
d. Urea
e. Valeric acid

66. Який препарат належить до групи блокаторів Н2 – гістамінових рецепторів?
a. Гастроцепін
b. Фамотидин
c. Альмагель
d. Алохол
e. Омепразол

67. Having examined the patient, the doctor made a diagnosis of tick-borne encephalitis. What is the route of transmission of this disease?
a. Vertical
b. Vector-borne
c. Parenteral
d. Airborne-droplet
e. Fecal-oral

68. A patient with signs of mercury poisoning has been delivered into an admission room. What antidote should be prescribed in this case?

a. Unithiol
b. Proserin
c. Calcium chloride
d. Atropine sulfate
e. Naloxone

69. A woman, who works at a factory that produces phenylhydrazine, came to a hospital with complaints of general weakness, dizziness, and drowsiness. Her blood has signs of anemia with high levels of reticulocytosis, anisocytosis, and poikilocytosis; isolated normocytes are present in the woman's blood. What type of anemia is it?
a. Aplastic anemia
b. Protein-deficiency anemia
c. Iron-deficiency anemia
d. Metaplastic anemia
e. Hemolytic anemia

70. Action of a number of drugs is based on the effect of competitive inhibition of enzyme activity. Name its characteristic feature.
a. Inhibition degree does not depend on the substrate concentration
b. Inhibitor has no effect on the enzyme's affinity for its substrate
c. Inhibitor is a structural analogue of the substrate
d. Inhibitor forms strong covalent bonds with the active site of the enzyme
e. Inhibitor is a structural analogue of the enzyme

71. What is the most common side effect of inhaled corticosteroids?
a. Osteoporosis
b. Arterial hypertension
c. Increased body mass
d. Subcapsular cataract
e. Oropharyngeal candidiasis

72. What drug has a hypoglycemic effect due to stimulation of pancreatic beta cells?
a. Heparin
b. Retabolil (nandrolone)
c. Prednisolone
d. Adrenaline hydrochloride (epinephrine)
e. Glibenclamide

73. До якого виду хроматогафії відносять метод газорідинної хроматографії?
a. Афінної
b. Гель-хроматографії
c. Розподільної
d. Адсорбційної
e. Іоннобмінної

74. Який спосіб титрування використовують, якщо до розчину досліджуваної речовини додають точно виміряний надлишок допоміжного титранта?
a. Пряме титрування
b. Титрування за залишком
c. Неводне титрування
d. Замісникове титрування
e. Будь-яке титрування

75. What is the mechanism of action of beta-lactam antibiotics?
a. Disruption of DNA synthesis
b. Inhibition of cell wall synthesis
c. Inhibition of DNA gyrase
d. Inhibition of cytoplasmic \\ membrane synthesis
e. Inhibition of protein synthesis \\ in ribosomes

76. Different structures of the bacterial cell perform different special functions. This component provides the adaptive capabilities of the bacterium and its protection against the adverse conditions of the environment. What component is it?

a. Spores
b. Capsule
c. Cilia
d. Inclusions
e. Flagella

77. The majority of live vaccines are made from microbes with reduced virulence. What is the name of such vaccines?

a. Adsorbed vaccines
b. Adjuvant vaccines
c. Anatoxin vaccines
d. Attenuated vaccines
e. Denatured vaccines

78. The patient is presented to the hospital with the phenomena of growing respiratory failure. He has clinical signs of bilateral subtotal pneumonia. The clinical diagnosis is confirmed by X-ray examination. What type of respiratory failure does this patient most likely have?

a. Peripheral
b. Restrictive
c. Obstructive
d. Thoracic diaphragm
e. Central

79. In what pair of substances the both of them form a precipitate of metallic silver when Tollens reagent is added (during heating)?

a. Ethanol and formic acid
b. Propanal and formic acid
c. Propanal and acetic acid
d. Propanol and formic acid
e. Acetic acid and formic acid

80. Salts and esters of oxalic acid are called:

a. Adipinates
b. Urates
c. Malonates
d. Succinates
e. Oxalates

81. What substances can be determined by means of substitution titration using the iodometric method?

a. Weak reducing agents
b. Strong oxidizing agents
c. Strong reducing agents
d. Saturated hydrocarbons
e. Unsaturated hydrocarbons

82. A man has a nitrate poisoning. What type of hypoxia will develop in this case?

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

83. When harvesting herbal raw material of calendula and chamomile, their inflorescences are being collected. What type of inflorescence is it?

a. Round capitulum

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

84. Which compound of those listed below is an alicyclic hydrocarbon?
a. Cyclohexene
b. Naphthalene
c. Benzene
d. Anthracene
e. Phenanthrene

85. What reaction can be classified as a pseudo-first-order reaction?
a. Etherification
b. Saponification
c. Combustion
d. Neutralization
e. Hydrolysis of sucrose

86. A man has undergone a course of radiotherapy and chemotherapy. The drug complex included 5-fluorodeoxyuridine that is an inhibitor of thymidylate synthase. This drug blocks the synthesis of a certain substance. What substance is it?
a. mRNA
b. tRNA
c. rRNA
d. Protein
e. DNA

87. A patient was prescribed losartan for treatment of arterial hypertension. What mechanism of action does this drug have?
a. Inhibition of phosphodiesterase
b. Angiotensin-receptor blockade
c. Calcium channel blockade
d. Inhibition of angiotensin-converting enzyme
e. Activation of central α-adrenoceptors

88. In medical practice barbiturates are used as sleeping pills. These substances act similar to rothenone and are inhibitors of tissue respiration. The mechanism of their action takes place on the enzymatic level. Which of the following enzymes do these substances inhibit?
a. Cytochrome C reductase
b. Succinate dehydrogenase
c. NADH-coenzyme Q reductase
d. Cytochrome oxidase
e. Adenosine triphosphate synthetase

89. During harvesting of a herbal raw material (belladonna), the plants had burns and patches of withering and rot. What microorganisms cause this kind of damage in plants?
a. Mycoplasma
b. Viruses
c. Viroids
d. Protozoa
e. Microfungi

90. A patient suffers from intense cough with production of viscous sputum. What drug can thin the sputum and facilitate expectoration?
a. Butamirate
b. Codeine phosphate
c. Glaucine
d. Acetylcysteine

e. Prenoxdiazine

91. В яких структурах рослинних клітин накопичується вторинний крохмаль?
a. Мітохондріях
b. Олеопластах
c. Протеопластах
d. Вакуолях
e. Амілопластах

92. Caffeine is one of the alkaloids contained in tea and coffee. Caffeine is contraindicated in case of:
a. Addiction
b. Migraine
c. Depression of nervous activity
d. Essential hypertension
e. Hypotension

93. The type of bacterial respiration is of great importance for the growth and reproduction of bacteria. Some species are unable to reproduce in the presence of oxygen and use sulfate respiration. What are these microorganisms called?
a. Facultative anaerobes
b. Obligate aerobes
c. Macroaerophiles
d. Microaerophiles
e. Obligate anaerobes

94. Glycyrrhiza glabra L., a valuable medicinal plant, is widely used in official and folk medicine. What part of the plant is harvested?
a. Roots with rhizomes
b. Leaves
c. Seeds
d. Grass
e. Inflorescences

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

96. Vitamins can enhance each other's effects, when taken simultaneously. What vitamin potentiates the activity of vitamin P?
a. B_1
b. D
c. A
d. B_2
e. C

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

98. The biological study of spores and pollen revealed tetrahedral spores with a semi-circular base and reticular surface in the pollen. There spores belong to:

a. Polypodiophyta
b. Equisetiphyta
c. Pinophyta
d. Bryophyta
e. Lycopodiophyta

99. In the process of creating vaccines, pathogens of infectious diseases are being attenuated. What is the essence of the attenuation process?
a. Discovering antigenic determinants of the main antigens of the pathogen
b. Inactivation of pathogens while preserving the antigenic structure of cells
c. Artificial reduction of virulent properties of pathogens
d. Isolation of protective antigens from microbial cells
e. Reduction of immunogenicity of the pathogen

100. A study of the microbiological purity of tablet formulations is conducted on the production site. After cultivating samples on mannitol salt agar, golden-yellow colonies grow up. Microscopic examination of colonies establishes the presence of gram-positive bacteria of spherical shape, located in clusters; microorganisms has the ability to coagulate the plasma. The pure culture of which of the following bacteria is discovered?
a. Staphylococcus epidermidis
b. Staphylococcus saprophyticus
c. Staphylococcus aureus
d. Enterobacteriaceae
e. Pseudomonas aeruginosa

101. A 37-year-old man developed leg edema after prolonged fasting. What pathogenetic factor plays the leading role in the development of edema in this case?
a. Increased oncotic pressure in the tissues
b. Increased osmotic pressure of interstitial fluid
c. Decreased osmotic blood pressure
d. Decreased oncotic blood pressure
e. Decreased hydrostatic blood pressure

102. Cosmetic cream against mimic wrinkles contains "vitamin Q10" --- ubiquinone. What is the metabolic role of this vitamin-like substance?
a. It is a component of the mitochondrial respiratory chain
b. It regulates differentiation of epithelial cells
c. It stimulates collagen synthesis
d. It decreases permeability of cell membranes
e. It regulates water-salt exchange

103. Under conditions of prolonged intoxication, a significant decrease in the activity of aminoacyl-tRNA synthetases can be observed. What metabolic process is disrupted in this case?
a. DNA replication
b. Protein biosynthesis
c. DNA repair
d. Genetic recombination
e. RNA processing

104. Cultivated annual plant with glands and indumentum has alternate obovate leaves and flat capitulum inflorescences with orange pseudoligulate ray florets and yellow tubular disc florets. Specify this plant.
a. Arctium lappa
b. Calendula officinalis
c. Echinacea purpurea
d. Centaurea cyanus
e. Artemisia absinthium

105. Microscopy shows that basidia with basidiospores are formed on the hymenium. What division do

these fungi belong to?
a. Zygomycota
b. Ascomycota
c. Lychenophyta
d. Chytridiomycota
e. Basidiomycota

106. Який із патогенетичних факторів відіграє провідну роль у розвитку набряків у пацієнтів після тривалого голодування?
a. Зниження онкотичного тиску крові
b. Зниження гідростатичного тиску крові
c. Зниження осмотичного тиску крові
d. Підвищення онкотичного тиску в тканинах
e. Підвищення осмотичного тиску інтерстиціальної рідини

107. A man developed agranulocytosis after pneumonia treatment with sulfonamides. Antibodies to neutrophils were detected in the patient's blood. This pathology belongs to the following type of allergic reactions:
a. Anaphylactic
b. Reactive
c. Cell-mediated
d. Cytotoxic
e. Immune complex

108. Total protein in blood serum is one of metabolic indicators. What test is usually used in clinical laboratories to determine this value?
a. Ninhydrin test
b. Sodium nitroprusside test
c. Biuret test
d. Xanthoproteic test
e. Lead acetate test

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

110. In order to carry out the silver cations identification, HCl was added to the solution. Later, the formed solution was followed by adding the solution of ammonia. Specify which of the below-mentioned compounds are formed in such case?
a. $[Ag(NH_3)_3]Cl$
b. $[Ag(NH_3)_2]Cl$
c. $[Ag_2(NH_3)_3]Cl$
d. AgOH
e. $AgCl$

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

112. Який патогенез розвитку цукрового діабету 1-го типу?
a. Гіперпродукція кортизолу
b. Гіперпродукція глюкагону

c. Гіперпродукція соматотропіну
d. Аутоімунне ушкодження В-клітин
e. Інсулінорезистентність жирової тканини

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

114. The method consisting in removal of low-molecular impurities from colloidal systems and high-molecular compound solutions by semipermeable membrane diffusion is called:
a. Decantation
b. Compensatory dialysis
c. Ultrafiltration
d. Electrodialysis
e. Dialysis

115. What cation can be detected with Chugaiev's agent (Dimethylglyoxime)?
a. K^{+}
b. Ca^{2+
c. Ni^{2+
d. Co^{2+
e. Mn^{2+

116. A patient has been hospitalized with signs of carbon monoxide poisoning. What type of hypoxia is characteristic of this condition?
a. Hypoxic hypoxia
b. Hemic hypoxia
c. Tissue hypoxia
d. Respiratory hypoxia
e. Circulatory hypoxia

117. There are certain patterns of chemical and biological processes occurring with the drug in the body. Reduced absorption of tetracycline when it is co-administered with antacids is an example of:
a. Pharmacokinetic incompatibility
b. Functional antagonism
c. Synergism
d. Pharmaceutical incompatibility
e. Pharmacodynamic incompatibility

118. Первинні та вторинні нітроалкани є таутомерними сполуками. Яка таутомерія характерна для них?
a. Аміно-імінна
b. Аци-нітротаутомерія
c. Азольна
d. Кето-енольна
e. Лактам-лактимна

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

120. A 53-year-old person has been admitted into the gastroenterology department with complaints of dyspeptic disorders and melena. Objectively, the patient has splenomegaly, ascites, and dilated superficial veins of the anterior abdominal wall. What syndrome can be characterized by these signs?

a. Arterial hypotension
b. Acholia
c. Portal hypertension
d. Suprahepatic jaundice
e. Cholemia

121. Preparations of colloid silver -- Protargol (silver proteinate) and Collargol (colloid silver) -- contain proteine compounds besides their active substance. What is the function of proteins in these preparations?

a. Improved preparation technology
b. Protection of colloid solution against coagulation
c. Decreased side effects
d. Increased storage time
e. Increased bactericidal action of \\ silver

122. What tissue can be characterized by permeable cells located within the root of the primary structure?

a. Exodermis
b. Pericycle
c. Endodermis
d. Mesodermis
e. Central axial cylinder

123. Isotonicity is one of the requirements for infusion solutions. What aqueous salt solution is used in clinical practice as an isotonic solution?

a. 4.5-5.0% glucose solution
b. 0.9% solution of MgCl_2
c. 10% solution of NaCl
d. 10% solution of CaCl_2
e. 0.85-0.90% solution of NaCl

124. A man came to a doctor complaining of a headache, pain in the throat during swallowing, and an increase in the body temperature. He was diagnosed with tonsillitis. What changes in the patient's blood can be expected in this case?

a. Eosinophilic leukocytosis
b. Lymphocytosis
c. Neutrophilic leukocytosis
d. Monocytosis
e. Basophilic leukocytosis

125. A drug solution sterilized by means of boiling was tested for sterility. Inoculation on Kitt-Tarozzi medium revealed clostridia. Clostridia survived the boiling because they are:

a. Thermophilic
b. Spore-formers
c. Anaerobic
d. Acid-fast
e. Prototrophic

126. What indicator is used, when sodium carbonate is being quantified in the preparation by means of acid-base titration?

a. Methyl orange
b. Ferroin
c. Methylene blue
d. Diphenylamine
e. Murexide

127. Який механізм передачі захворювання епідемічного висипного тифу?
a. Парентеральний
b. Вертикальний
c. Повітряно-крапельний
d. Фекально-оральний
e. Трансмісивний

128. To what electrode will the protein particle move during electrophoresis, if its isoelectric point is 4.0 and the pH of the solution is 5.0?
a. First to the anode, and then to the cathode
b. To the anode
c. There will be no movement
d. To the cathode
e. First to the cathode, and then to the anode

129. What can be used to distinguish formic acid from acetic acid?
a. $Br_2 (H_2O)$
b. $NaOH$
c. H_2SO_4
d. $[Ag(NH_3)_2]OH$
e. $NaHCO_3$

130. Який збудник викликає захворювання сифіліс?
a. Treponema pallidum
b. Salmonella typhi
c. Corynebacterium diphtheriae
d. Borrelia recurrentis
e. Mycobacterium tuberculosis

131. In medicine and pharmacy, such phenomena as adsorption, wetting, adhesion, etc. can be observed. What are they called?
a. Optical phenomena
b. Superficial phenomena
c. Physico-chemical phenomena
d. Electrokinetic phenomena
e. Molecular-kinetic phenomena

132. The bacterial culture obtained from a patient does not grow when exposed to oxygen. Conditions suitable for bacterial culture growth can be created in:
a. Oxidative medium
b. Pasteur oven
c. Serum-supplemented medium
d. Krotov apparatus
e. Anaerobic culture jar

133. The main mechanism of ammonia neutralization in the body is the biosynthesis of urea. The cycle of urea synthesis begins with the formation of a certain high-energy compound. What high-energy compound is it?
a. Fumaric acid
b. Arginine
c. Argininosuccinate
d. Carbamoyl phosphate
e. Citrulline

134. Sulfanilamides contain a primary aromatic amino group in their structure. What method is used for quantitative determination of these compounds?
a. Iodometry
b. Permanganatometry
c. Nitritometry

d. Dichromatometry
e. Cerimetry

135. What drug should be prescribed to a patient with bronchospasm?
a. Bisacodyl
b. Salbutamol
c. Insulin
d. Oxytocin
e. Vicasol (Menadione)

136. An analytical chemist performs a qualitative analysis of cations that belong to the sixth analytical group. If nickel ions are processed with Chugaiev's reagent (dimethylglyoxime), a colored compound is produced. What is the color of the resulting compound?
a. Green
b. Red
c. Yellow
d. Blue
e. Violet

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

138. In snake venom there is a substance that causes erythrocyte hemolysis when it is introduced into a human organism. Blood test revealed a large amount of lysolecithin (lysophosphatidylcholine). What enzyme leads to accumulating lysolecithin in blood?
a. Phospholipase D
b. Phospholipase A2
c. Neuraminidase
d. Phospholipase A1
e. Phospholipase C

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

140. Name the ability of high-molecular compounds to prevent precipitation of lyophobic sols and deposition of cholesterol plaques on the vessel walls:
a. Colloid protection
b. Thixotropy
c. Coagulation
d. Sedimentation
e. Coacervation

141. What drug is a non-selective beta-blocker?
a. Adrenaline hydrochloride
b. Anaprilin (Propranolol)
c. Atropine
d. Metoprolol
e. Prozerin (Neostigmine)

142. One hour after a child took polyvitamins in the dosage form of a syrup, the child developed a markedly itching urticaria-type rash all over the body. What type of allergic response can be characterized by this sign?

a. Cytotoxic
b. Autoallergic
c. Anaphylactic
d. Immune complex
e. Delayed-type hypersensitivity

143. Як називаються реакції в яких багаторазово повторюється цикл елементарних актів за участю активних частинок?

a. Фотохімічні
b. Пов'язані
c. Паралельні
d. Ланцюгові
e. Послідовні

144. The patient, who suffers from rheumatoid arthritis and concomitant duodenal ulcer should be prescribed a non-steroidal anti-inflammatory drug. What drug is most suitable in this case?

a. Paracetamol
b. Diclofenac sodium
c. Metamizole
d. Celecoxib
e. Acetylsalicylic acid

145. Interferons are natural antiviral and antitumor agents. What is their mechanism of action?

a. Transcription activation
b. Repair activation
c. Replication activation
d. Protein synthesis increase
e. Protein synthesis depression

146. When a galvanic cell operates under standard conditions, the chemical energy of the redox process transforms into the following type of energy:

a. Electromagnetic energy
b. Nuclear energy
c. Mechanical energy
d. Thermal energy
e. Electrical energy

147. After eating strawberries, a child developed itchy red spots on the skin (urticaria). What type of leukocytosis would be detected in this child?

a. Monocytic
b. Neutrophilic
c. Basophilic
d. Eosinophilic
e. Lymphocytic

148. The mechanism of action of hormones depends on their chemical nature. What hormones can penetrate the membrane and bind with intracellular receptors?

a. Catecholamines
b. Oxytocin and vasopressin
c. Steroid and thyroid hormones
d. Tropic hormones
e. Insulin and glucagon

149. What physico-chemical method is used to determine the pH of solutions for injections?

a. Conductometry
b. Potentiometry

c. Electrolysis
d. Polarography
e. Amperometry

150. To assess the bacterial contamination of the soil, where humans or animals are the source of contamination, the presence of sanitary indicator microorganisms must be determined. What microorganism indicates old fecal contamination of the soil?
a. Streptococcus faecalis
b. Escherichia coli
c. Salmonella enteritidis
d. Pseudomonas aeruginosa
e. Clostridium perfringens

151. What type of cardiac arrhythmia occurs as a result of simultaneous disruption of excitability and conduction functions?
a. Extrasystole
b. Atrioventricular block
c. Respiratory arrhythmia
d. Atrial fibrillation
e. Sinus tachycardia

152. Serology is the leading method of syphilis diagnostics. What test is used to diagnose this disease?
a. Wright test
b. Haddelson test
c. Widal test
d. Wassermann test
e. Gruber test

153. A woman with hypertension came to a doctor complaining of dry cough that developed against the background of her therapy. What antihypertensive drug was she taking?
a. Nifedipine
b. Furosemide
c. Lisinopril
d. Atenolol
e. Dichlothiazide (Hydrochlorothiazide)

154. The student is studying a plant organ with radial symmetry, unlimited growth and positive geotropism. It provides nourishment, vegetative reproduction and plant fastening in the soil. Which of the following is described?
a. Root
b. Leaf
c. Rhizome
d. Stem
e. Seed

155. In E) coli cells, the synthesis of pyrimidine nucleotides occurs according to the scheme of the metabolic pathway: $CO_2 + NH_3$ + 2ATP> S1> S2> UTP> CTP. When CTP concentration in the cell increases, the synthesis of pyrimidine nucleotides stops. What type of regulation is described here?
a. Detachment of inhibitor proteins
b. Allosteric regulation
c. Attachment of inhibitor proteins
d. Enzyme molecule phosphorylation
e. Partial proteolysis

156. A patient demonstrates symmetrical dermatitis on the palms. A doctor made a diagnosis of pellagra. What vitamin deficiency can result in such symptoms?
a. Ascorbic acid
b. Cholecalciferol

c. Cobalamin
d. Folic acid
e. Nicotinic acid

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

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

159. What pharmacological effect of diazepam allows using it in the treatment of neuroses?
a. Anxiolytic
b. Antidepressant
c. Diuretic
d. Analgesic
e. Antipyretic

160. Preventive examination revealed an enlargement of the patient's thyroid gland, exophthalmos, high body temperature, and an elevated heart rate of 110/min. What hormone levels should be measured in the patient's blood in this case?
a. Cortisol
b. Testosterone
c. Insulin
d. Thyroxine
e. Glucagon

161. During bacteriology of the feces of a patient with diarrhea, a pure culture of rod-shaped, slightly bent microorganisms was isolated. In the microslide, these microorganisms resemble schools of fish. Their inoculation on alkaline media (alkaline peptone water) results in formation of a blue-tinted film after 6 hours. What pathogen has such properties?
a. Salmonellae
b. Mycobacteria
c. Vibrio cholerae
d. Spirochetes
e. Escherichia coli

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

163. What value determines the degree to which foreign ions can influence the potential of an ion-selective electrode?
a. Diffusion coefficient

b. Activity coefficient
c. Osmotic coefficient
d. Electrical conductivity \\ coefficient
e. Selectivity coefficient

164. To stop a fever, the patient was prescribed a centrally acting non-narcotic analgesic that, unlike the other drugs in this group, has relatively weak anti-inflammatory effect. What drug is it?
a. Indomethacin
b. Analgin (Metamizole)
c. Nurofen (Ibuprofen)
d. Paracetamol
e. Aspirin

165. Thiocyanatometric titration method requires secondary standard solution of potassium thiocyanate that is standardized with standard solution of:
a. Sulfuric acid
b. Hydrochloric acid
c. Iron (II) sulfate
d. Silver nitrate
e. Copper (II) nitrate

166. Which of the listed species of medicinal plants is considered to be a weed?
a. Convallaria majalis
b. Papaver somniferum
c. Mentha piperita
d. Salvia officinalis
e. Plantago major

167. Coumarins, vitamin K antagonists, suppress the processes of blood coagulation. Synthesis of what protein is blocked by coumarins?
a. Transferrin
b. Gamma globulin
c. Albumin
d. Prothrombin
e. Ceruloplasmin

168. During the assessment of air purity in an aseptic unit of a phamacy, sedimentation analysis resulted in growth of small colonies with areas of hemolysis. What medium was used for inoculation in this case?
a. Egg-yolk salt agar
b. Blood agar
c. Endo agar
d. Levine formulation (eosin methylene blue agar)
e. Ploskirev agar

169. The therapeutic properties of activated charcoal are due to its large specific surface area. Name the phenomenon, when gas absorption occurs only at the surface of a solid object:
a. Cohesion
b. Adhesion
c. Adsorption
d. Desorption
e. Recuperation

170. Water samples were received by a bacteriological laboratory for determining their coli index. What is the coli index?
a. Number of Escherichia coli in 1 liter of water
b. Number of staphylococci in 1 liter of water
c. Number of coliphages in 1 liter of water
d. Number of enterococci in 1 liter of water

e. Number of pseudomonads in 1 liter of water

171. Pathogenic bacteria in the human body can form structures that protect them from phagocytosis. Name these structures.
a. Mesosomes
b. Inclusions
c. Capsule
d. Flagella
e. Spores

172. Etiological factors of infectious diseases can be infectious agents with diverse ultrastructure. Which of the following groups does not have cellular structure, protein synthesis, enzymatic and energy systems?
a. Protozoa
b. Viruses
c. Rickettsia
d. Bacteria
e. Fungi

173. Який із нижченаведених антигіпертензивних препаратів призначається пацієнтам із бронхіальною астмою?
a. Лабеталол
b. Анаприлін
c. Надолол
d. Фармадипін
e. Метопролол

174. Який механізм інгібіторної дії неостигміну (прозерину)?
a. Ковалентне зв’язування поза активним центром фермента
b. Ковалентне зв'язування з субстратом ферменту
c. Денатурація фермента
d. Конкуренція з ацетилхоліном за активний центр фермента
e. Окиснення іона заліза в активном у центрі фермента

175. What family of viruses has a unique reverse transcriptase enzyme?
a. Retroviruses
b. Picornaviruses
c. Togaviruses
d. Reoviruses
e. Flaviviruses

176. People, who were indoors during a fire, suffer from a carbon monoxide poisoning. What type of hypoxia is observed in such cases?
a. Hypoxic hypoxia
b. Circulatory hypoxia
c. Tissue hypoxia
d. Respiratory hypoxia
e. Hemic hypoxia

177. Який пігмент утворюється в реакції окиснення гему?
a. Хлорофіл
b. Уробіліноген
c. Каротин
d. Білівердин
e. Стеркобіліноген

178. У чоловіка з діагнозом: цукровий діабет виявили такі показники артеріальної крові: pH крові – 7,25, pCO2 – 37 мм рт. ст., SB – 19,5 ммоль/л, BB – 39 ммоль/л, BE – (-7) ммоль/л, кетонові тіла крові – 1,9 ммоль/л, титраційна кислотність сечі – 50 ммоль/добу. Яке порушення

кислотно-основного стану у пацієнта?
a. Газовий ацидоз
b. Змішаний ацидоз
c. Змішаний алкалоз
d. Газовий алкалоз
e. Метаболічний ацидоз

179. In the patient, a gallstone lodged in the common bile duct has blocked the flow of bile into the intestine. What digestive process will be disturbed in this case?
a. Absorption of proteins
b. Digestion of carbohydrates
c. Absorption of carbohydrates
d. Digestion of proteins
e. Digestion of fats

180. What common property of cation compounds Al^{3+, Zn^{2+, Cr^{3+, Sn^{2+ unites them within the IV analytical group (acid-base classification)?
a. Insolubility of salts in water
b. Good solubility of some salts
c. Solubility of hydroxides in acids
d. Solubility of hydroxides in an excess ammonia solution
e. Amphotericity of hydroxides

181. Від якого показника залежть коагулююча здатність електроліту?
a. Густини золю
b. Об’єму золю
c. Концентрації електроліту
d. Заряду іона-коагулятора
e. Ступеня дисперсності золю

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

183. Gastric herbal tea contains oval brown lignified "cones" up to 1.5 cm long, which are:
a. Alnus infructescences
b. Platycladus orientalis cones
c. Cupressus cones
d. Juniperus galbuli
e. Larix cones

184. Which one of the listed compounds belongs to conjugated dienes?
a. CH_2=CH-C(CH_3)_2-CH=CH_2
b. CH_2=C=CH-CH_2-CH_3
c. CH_2=C=CH_2
d. CH_2=CH-CH_2-CH=CH_2
e. CH_2=CH-CH=CH-CH_3

185. Early-flowering rhizomatous ephemeroids include: Tussilago farfara, Convallaria majalis, and:
a. Thymus serpyllum
b. Allium cepa
c. Carum carvi
d. Chamomilla recutita
e. Adonis vernalis

186. What stage of chronic renal failure can be characterized by metabolic acidosis, azotemia, itching, ammonia breath, and impaired functioning of vital organs?

a. Acute renal failure

b. Uremia

c. Nephrotic syndrome

d. Renal colic

e. Tubulopathy

187. A patient with an acute myocardial infarction had been receiving heparin as a component of complex therapy. After a time, the patient developed hematuria. What drug is indicated as an antidote to heparin?

a. Neodicoumarin (ethyl biscoumacetate)

b. Aminocaproic acid

c. Protamine sulfate

d. Vicasol (Menadione)

e. Fibrinogen

188. What cation of the third analytical group can be precipitated using the group reagent H_2SO_4 only in the presence of ethanol (binds water and concentrates the solution)?

a. K^+

b. Sr^2+

c. Ca^2+

d. Ba^2+

e. Na^+

189. For the symptomatic treatment of diarrhea, the doctor prescribed the patient a drug that inhibits intestinal peristalsis after making sure that the patient's diarrhea was of non-infectious origin. What drug was prescribed in this case?

a. Mannitol

b. Dexamethasone

c. Loperamide

d. Augmentin (Co-amoxiclav)

e. Thiamine

190. What type of indicators is used in the acid-base method of quantitative analysis?

a. pH indicators

b. Adsorption indicators

c. Chemiluminescent indicators

d. Redox indicators

e. Metallochromic indicators

191. What substance is used as an indicator in the back titration of an aqueous solution of acetic acid?

a. Eriochrome black T

b. Phenolphthalein

c. Diphenylcarbazone

d. Diphenylamine

e. Murexide

192. Elevated levels of ketone bodies were detected in the blood of a patient with diabetes mellitus. Ketone bodies are synthesized from the following compound:

a. Malate

b. Lactate

c. Glucose

d. Acetyl-CoA

e. Succinate

193. To preserve valuable varietal qualities of peppermint, the optimal method of its propagation was chosen. What method is it?

a. Parts of the tuber
b. Parts of the rhizome
c. Leaf cuttings
d. Plantlets
e. Germinated seeds

194. A human is immune to the plague of cattle and dogs. What type of immunity is it?
a. Artificial active
b. Natural active
c. Natural passive
d. Artificial passive
e. Innate

195. Which of the listed plants is a bush with imparipinnate leaves, decussate leaf arrangement, and juicy black fruits?
a. Chelidonium majus
b. Sambucus nigra
c. Urtica dioica
d. Ledum palustre
e. Arctostaphylos uva-ursi

196. A dry-heat box is used for sterilization of various materials and instruments in a bacteriological laboratory. This sterilization method can be applied to the following objects:
a. Wire inoculating loops
b. Physiological solution
c. Simple nutrient medium
d. Rubber gloves
e. Glass test tubes

197. За яким механізмом відбувається приєднання Br_2 до пропену?
a. A_N
b. S_N
c. S_R
d. A_E
e. S_E

198. What reaction occurs according to the free-radical (SR) mechanism?
a. $C_2H_6+Cl_2$
b. $CH_2=CH_2+Cl_2$
c. $CH_3CH_2OH+HCl$
d. $CH_3–CH_3+O_2$
e. $C_6H_6+Cl_2$

199. A benzimidazole derivative, omeprazole, has been prescribed to a patient with a duodenal ulcer accompanied by an increased secretion of gastric juice. What is the mechanism of action of this drug?
a. Stimulation of H2-histamine receptors
b. Blockade of M1-cholinergic receptors
c. Irreversible blockade of H^+, K^+ -ATPase
d. Stimulation of H^+, K^+ -ATPase
e. Blockade of H2-histamine receptors

200. In common corn (Zea mays), male spikelets are gathered in an apical panicle and female flowering spikelets form dense axillary spadices. What type of plant is Zea mays?
a. Polyecious
b. Dioecious
c. Unisexual
d. Monoecious
e. Monandrous

201. What reagent can be used to distinguish maltose (a reducing disaccharide) from sucrose (a non-reducing disaccharide)?

a. $NaOH$
b. Br_2
c. $FeCl_3$
d. Tollens reagent
e. $K_4[Fe(CN_6)]$

202. До якого класу сполук належить Цитохром Р450?

a. Піридинопротеїн
b. Флавопротеїн
c. Гемопротеїн
d. Ліпопротеїн
e. Нуклеопротеїн

203. The fruit is a bright-red juicy follicetum with a sweet-sour taste. Its seeds are kidney-shaped and smell similar to lemon. Such fruits belong to:

a. Malus domestica
b. Sorbus aucuparia
c. Citrus limon
d. Viburnum opulus
e. Schisandra chinensis

204. After a physical exertion, a patient developed an angina pectoris attack caused by myocardial ischemia. What definition most accurately describes the concept of ischemia?

a. Dilation of arterioles
b. Increased oxygen delivery to tissues
c. Oxygen deficiency in the circulatory system
d. Discrepancy between the blood supply to the tissues and the need for it
e. Decreased erythrocyte count in the blood

205. Який препарат належить до групи антихолінестеразних засобів?

a. Дипіроксим
b. Дитилін (суксаметонію хлорид)
c. Ізонітрозин
d. Ацетилхолін
e. Прозерин (неостигмін)

206. Microscopy of the smears obtained from the coating on the patient's tonsils was stained according to the Neisser technique. The staining revealed thin yellow bacilli with dark blue grains at their ends, arranged in the form of the Roman numeral V. What pathology can be suspected based on the results of microscopy?

a. Diphtheria
b. Tuberculosis
c. Measles
d. Pertussis
e. Influenza

207. According to Van't Hoff rule, when the temperature is raised by 10 degrees, the reaction rate increases by:

a. 10 times
b. 5 times
c. 2--4 times
d. Temperature does not affect reaction rate
e. 1.5 times

208. Яким методом здійснюють кількісне визначення вісмуту в препараті?

a. Перманганатометрії
b. Йодометрії

c. Меркуриметрії
d. Аргентометрії
e. Комплексонометрії

209. What drug inhibits cholesterol synthesis in the liver?
a. Fenofibrate
b. Probucol
c. Colestipol
d. Atorvastatin
e. Parmidinum

210. A student studies the digestive system of vertebrates. The organ that is being studied is primarily located in the right upper quadrant of the abdomen. It detoxifies various metabolites, produces hormones and digestive biochemicals, regulates glycogen storage, synthesizes proteins, and decomposes red blood cells. What organ is being studied by the student?
a. Liver
b. Heart
c. Kidneys
d. Pancreas
e. Lungs

211. A patient complains of loss of appetite, weight loss, weakness, and abdominal pain. Laboratory blood test shows the following: Hb --- 90 g/L; erythrocytes --- $2.0 · 10^{12$/L; color index --- 1.4. B_{12} deficiency anemia has been diagnosed. What substance is deficient in this patient, causing the anemia?
a. Castle factor
b. Hydrochloric acid
c. Renin
d. Secretin
e. Pepsin

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

213. The presence of antibodies to HIV has been established in the analyzed serum by means of enzyme-linked immunosorbent assay. What method or reaction must be used to confirm the diagnosis of AIDS?
a. Biological method
b. Immunoblotting
c. Immunofluorescence
d. Virological method
e. Bacteriological method

214. How many stereoisomeric aldohexoses exist?
a. 8
b. 6
c. 2
d. 4
e. 16

215. Який основний метод лабораторної діагностики ВІЛ інфекції?
a. Радіоімунний аналіз
b. Імунофлуоресцентний
c. Імуноферментний аналіз

d. Реакція коаглютинації
e. Реакція пасивної гемаглютинації

216. Для яких систем характерна седиментація?
a. Розчинів ВМР
b. Суспензій
c. Золів
d. Розчинів електролітів
e. Розчинів неелектролітів

217. What solution is used to determine the mass-volume fraction of ammonia in a solution?
a. Hydrochloric acid solution
b. Iodine solution
c. Potassium permanganate solution
d. Sulfuric acid solution
e. Sodium hydroxide solution

218. A person came to a doctor with complaints of loss of sensitivity and pain along the peripheral nerves. Blood testing revealed elevated levels of pyruvic acid. What vitamin can cause such changes, if it is deficient in the body?
a. Pantothenic acid
b. Biotin
c. Vitamin $B1$
d. Vitamin PP
e. Vitamin $B2$