

1. What titrimetric method of analysis uses both external and internal indicators?

- a. Complexonometry
- b. Argentometry
- c. Nitritometry**
- d. Alkalimetry
- e. Permanganatometry

2. 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. Stenotic
- b. Gasping
- c. Kussmaul**
- d. Biot
- e. Cheyne-Stokes

3. 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. Hypertrophic obesity
- b. Transport hyperlipemia
- c. Alimentary hyperlipemia**
- d. Hyperplastic obesity
- e. Retention hyperlipemia

4. What enzyme allows for synthesis of various genes from template RNA to DNA in genetic engineering (this enzyme catalyzes the process observed in RNA-viruses)?

- a. Exonuclease
- b. Reverse transcriptase**
- c. Helicase
- d. Endonuclease
- e. DNA-ligase

5. What drug should not be prescribed for the treatment of arterial hypertension in a patient with gout?

- a. Cozaar (Losartan)
- b. Enalapril
- c. Hydrochlorothiazide**
- d. Amlodipine
- e. Atenolol

6. A person has been stung by a bee. The stung area developed redness and edema. What is the main mechanism of edema development?

- a. Decreased oncotic blood pressure
- b. Disturbed lymphatic efflux
- c. Decreased osmotic blood pressure
- d. Increased hydrostatic blood pressure
- e. Increased permeability of the \\ capillaries**

7. What cations belong to the IV analytical group according to the acid-base classification?

- a. Silver, lead, nickel, potassium, barium, bismuth
- b. Aluminum, zinc, chromium(II), tin(II), tin(IV), arsenic(III), arsenic(V)**
- c. Magnesium, calcium, strontium, barium
- d. Sodium, potassium, ammonium, silver, lead
- e. Calcium, strontium, barium, potassium, bismuth

8. After the examination, the patient was diagnosed with typhus. What is the route of transmission of this disease?

- a. Vertical transmission
- b. Parenteral transmission

c. Airborne droplet transmission

d. Vector-borne transmission

e. Fecal-oral transmission

9. Pastes are used in medicine to treat skin diseases. What type of disperse systems are they?

a. Aerosols

b. Emulsions

c. Powders

d. Suspensions

e. Foams

10. $\text{CH}_3\text{-CH}_2\text{-OH}$ and $\text{CH}_3\text{-O-CH}_3$ are a pair of compounds that can be classified as isomers of the following type:

a. Geometric (cis-trans) isomers

b. Carbon chain isomers

c. Tautomers

d. Functional group isomers

e. Mirror (optical) isomers

11. 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. Amylase

b. Aldolase

c. Pepsin

d. Lactate dehydrogenase

e. Creatine kinase

12. 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. Sn(IV) ions

c. As(III) ions

d. Cr(III) ions

e. Al(III) ions

13. What reference electrode can be used in the potentiometric analysis of a medicinal substance?

a. Zinc electrode

b. Antimony electrode

c. Glass electrode

d. Quinhydrone electrode

e. Silver chloride electrode

14. 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. Cancer cachexia

c. Infiltrating growth

d. Metastasis

e. Invasion in surrounding tissues

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. Primary

b. Secondary

c. Reserve

d. Transitory

e. Resistant

16. What is the vapor pressure of a liquid at its boiling point?

- a. Equal to saturated vapor pressure at 273 K
- b. Minimum
- c. Maximum
- d. Equal to atmospheric pressure**
- e. Equal to saturated vapor pressure at room temperature

17. 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. Methylene blue
- b. Formaldehyde solution
- c. Copper sulfate
- d. Iodine alcoholic solution**
- e. Brilliant green

18. A patient with gout has been prescribed allopurinol. What is the mechanism of action of this drug?

- a. Stimulation of uric acid breakdown
- b. Inhibition of COX-2 enzyme
- c. Activation of microsomal oxidation in the liver
- d. Inhibition of xanthine oxidase enzyme, inhibition of uric acid synthesis**
- e. Intensification of uric acid excretion by the kidneys

19. Для представників якої родини характерні такі ознаки: плівчасті прилистки зростаються в розтруб, плід псевдомонокарпний горіхоподібний?

- a. Lamiaceae
- b. Rosaceae
- c. Brassicaceae
- d. Polygonaceae**
- e. Fabaceae

20. Total content of chloride, bromide, and iodide ions in the investigated solution can be quantitatively determined with the following titrant:

- a. Sodium nitrite solution
- b. Potassium dichromate solution
- c. Potassium permanganate solution
- d. Silver nitrate solution**
- e. Sodium thiosulfate solution

21. What hormonal drug is used in cases of atonic uterine bleeding?

- a. Oxytocin**
- b. Insulin
- c. Progesterone
- d. Prednisolone
- e. L-thyroxine

22. 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. Biological membrane
- c. Collodion film
- d. Glass**
- e. Gelatine

23. A local general practitioner recommends taking interferon for influenza prevention. What is the mechanism of action of this drug?

- a. Prevents adsorption of virus in cell receptors
- b. Inhibits virion exit from cells
- c. Blocks virus stripping

d. Blocks virus protein synthesis

e. Disrupts the process of virus assembly

24. 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 acetic acid

c. Acetic acid and formic acid

d. Propanol and formic acid

e. Propanal and formic acid

25. A patient developed neuritis of the facial nerve after five months of tuberculosis treatment. What drug has caused this side effect?

a. Isoniazid

b. Benzylpenicillin sodium

c. Rifampicin

d. Ceftriaxone

e. Para-aminosalicylate sodium

26. Який препарат із групи психотропних засобів блокує дофамінові рецептори?

a. Кофеїн-бензоат натрію

b. Амітриптилін

c. Аміназин (хлорпромазин)

d. Анальгін (метамізол натрію)

e. Діазепам

27. 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(I) cations

b. Tin(II) cations

c. Silver(I) cations

d. Lead(II) cations

e. Mercury(II) cations

28. 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. Tubular

c. Labiate

d. Saucer-shaped

e. Funnelform

29. In medicine and pharmacy, such phenomena as adsorption, wetting, adhesion, etc. can be observed. What are they called?

a. Physico-chemical phenomena

b. Electrokinetic phenomena

c. Superficial phenomena

d. Optical phenomena

e. Molecular-kinetic phenomena

30. A patient presents with hypoxia. What metabolic process activates when oxygen supply is insufficient?

a. Pentose-phosphate pathway

b. Oxidative decarboxylation of keto acids

c. Tricarboxylic acid cycle

d. Urea cycle

e. Anaerobic glycolysis

31. 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. Sodium hydroxide
- b. Hot water**
- c. Hydrochloric acid
- d. Sodium chloride
- e. Ammonia

32. Which compound of those listed below is an alicyclic hydrocarbon?

- a. Naphthalene
- b. Benzene
- c. Phenanthrene
- d. Cyclohexene**
- e. Anthracene

33. 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. Inactivated vaccine
- b. Antitoxic serum
- c. Immunoglobulin
- d. Adjuvant
- e. Anatoxin**

34. Sclerenchyma fibers, formed by procambium or parenchyma around vascular bundles or secretory cavities, strengthen and protect them. What type of fibers is it?

- a. Pericyclic fibers
- b. Phloem fibers
- c. Xylem fibers
- d. Perivascular fibers**
- e. Cortical fibers

35. What pair of compounds can be classified as functional group isomers?

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

36. 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. Distilled water
- b. Benzene
- c. Amyl alcohol
- d. Chloroform
- e. Ethyl alcohol**

37. Pathogenic bacteria in the human body can form structures that protect them from phagocytosis. Name these structures.

- a. Flagella
- b. Capsule**
- c. Mesosomes
- d. Spores
- e. Inclusions

38. In E. coli cells, the synthesis of pyrimidine nucleotides occurs according to the scheme of the metabolic pathway: $\text{CO}_2 + \text{NH}_3 + 2\text{ATP} \rightarrow \text{S}_1 \rightarrow \text{S}_2 \rightarrow \text{UTP} \rightarrow \text{CTP}$. When CTP concentration in the cell increases, the synthesis of pyrimidine nucleotides stops. What type of regulation is described here?

- a. Attachment of inhibitor proteins

- b. Enzyme molecule phosphorylation
- c. Partial proteolysis
- d. Allosteric regulation**
- e. Detachment of inhibitor proteins

39. 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. Thyroxine**
- b. Insulin
- c. Cortisol
- d. Testosterone
- e. Glucagon

40. In cases of severe pancreatitis, physicians usually prescribe the drugs that help prevent pancreatic autolysis. These drugs inhibit the following type of enzymes:

- a. Phosphatases
- b. Amylases
- c. Proteases**
- d. Lipases
- e. Dehydrogenases

41. 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. Central
- b. Obstructive
- c. Peripheral
- d. Restrictive**
- e. Thoracic diaphragm

42. A patient, who was prescribed famotidine for peptic ulcer disease, came to a pharmacy. What mechanism underlies the action of this medicine?

- a. Inhibition of the $H^+K^+ATPase$ activity
- b. Muscarinic cholinoreceptor blockade
- c. H_2 -histamine receptors blockade**
- d. H_1 -histamine receptors blockade
- e. Cholinergic receptors blockade in the sympathetic ganglia

43. What adsorbent is used as a suspension to relieve the intoxication caused by alkaloid poisoning?

- a. Activated charcoal**
- b. Kaolin
- c. Bentonite
- d. Silica gel
- e. Starch

44. In the course of an experiment in the mesenteric vein of a toad a thrombus was created with a crystal of common salt. What processes occurred during the first stage of thrombus formation?

- a. Production of active thromboplastin
- b. Production of thrombin
- c. Production of fibrin monomer
- d. Adhesion, aggregation, agglutination of platelets**
- e. Production of fibrin polymer

45. 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. Potassium
- b. Calcium

- c. Barium
- d. Sodium

e. Aluminium

46. Який механізм передачі захворювання епідемічного висипного тифу?

- a. Фекально-оральний
- b. Повітряно-крапельний

c. Трансмісивний

- d. Парентеральний
- e. Вертикальний

47. 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. RNA processing
- b. Genetic recombination
- c. DNA repair
- d. DNA replication

e. Protein biosynthesis

48. Reaction of sodium ions with potassium hexahydroxoantimonate (V) in a neutral medium produces precipitate. Specify the color of this precipitate:

- a. Red
- b. Yellow
- c. Green
- d. Blue

e. White

49. Helmholtz energy is the direction criterion of an arbitrary process at a constant:

- a. Entropy and pressure
- b. Temperature and volume**
- c. Entropy and volume
- d. Internal energy and volume
- e. Temperature and pressure

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

- a. Adjuvant vaccines
- b. Denatured vaccines
- c. Anatoxin vaccines

d. Attenuated vaccines

- e. Adsorbed vaccines

51. What reagents produce a reaction that follows the free radical (SR) mechanism?

a. Ethane and chlorine in the light

- b. Ethylene and chlorine
- c. Benzene and chlorine in the presence of AlCl_3
- d. Ethane and oxygen
- e. Ethanol and hydrogen chloride

52. 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. Polyploid
- b. Diploid
- c. Triploid

d. Haploid

- e. Tetraploid

53. 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. Leaf
- b. Root**
- c. Seed
- d. Stem
- e. Rhizome

54. 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. *Artemisia absinthium*
- b. *Echinacea purpurea*
- c. *Arctium lappa*
- d. *Centaurea cyanus*
- e. *Calendula officinalis***

55. 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. Diaphragm
- c. Membrane
- d. Jelly
- e. Gel

56. 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. Digestion of carbohydrates
- b. Digestion of fats**
- c. Digestion of proteins
- d. Absorption of carbohydrates
- e. Absorption of proteins

57. Many serological reactions require strictly aseptic conditions. What method of sterilization is optimal for decontamination of laboratory glassware?

- a. Filtration
- b. Pasteurization
- c. Dry heat**
- d. Tyndallization
- e. Calcination

58. A patient has been warned that the medicine prescribed to him can cause a cough. Name this medicine:

- a. Dichlothiazide (Hydrochlorothiazide)
- b. Lisinopril**
- c. Phenyhydrazine (Nifedipine)
- d. Metoprolol
- e. Clonidine (Clonidine)

59. Proteins are the catalysts of biochemical processes. What type of homogeneous catalysis includes the processes with their participation?

- a. Gas-phase homogeneous catalysis
- b. Acid-base catalysis
- c. Redox catalysis
- d. Enzyme catalysis**
- e. Coordination catalysis

60. 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. Tissue
- b. Hemic
- c. Anemic

d. Circulatory

- e. Hypoxic

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

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

62. 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. Amylase
- b. Albumin
- c. Glucose
- d. Cholesterol

e. Bilirubin

63. What is the most common side effect of inhaled corticosteroids?

- a. Arterial hypertension
- b. Subcapsular cataract
- c. Oropharyngeal candidiasis**
- d. Increased body mass
- e. Osteoporosis

64. Total protein in blood serum is one of metabolic indicators. What test is usually used in clinical laboratories to determine this value?

a. Biuret test

- b. Lead acetate test
- c. Xanthoproteic test
- d. Ninhydrin test
- e. Sodium nitroprusside test

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

66. 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. Dialysis**
- c. Compensatory dialysis
- d. Ultrafiltration
- e. Electrodialysis

67. What cardiac glycoside is obtained from lily of the valley?

- a. Celanid (Lanatoside C)
- b. Strophanthin K

- c. Digitoxin
- d. Corglycon**
- e. Adoniside

68. 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 active
- b. Immunotropic
- c. Specific passive**
- d. Non-specific
- e. General

69. Microscopy shows that basidia with basidiospores are formed on the hymenium. What division do these fungi belong to?

- a. Chytridiomycota
- b. Basidiomycota**
- c. Ascomycota
- d. Lichenophyta
- e. Zygomycota

70. 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. Decreased osmotic blood pressure
- b. Decreased hydrostatic blood pressure
- c. Increased oncotic pressure in the tissues
- d. Increased osmotic pressure of interstitial fluid
- e. Decreased oncotic blood pressure**

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

- a. Activity coefficient
- b. Diffusion coefficient
- c. Osmotic coefficient
- d. Electrical conductivity \ coefficient
- e. Selectivity coefficient**

72. 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. Atenolol
- c. Furosemide
- d. Lisinopril**
- e. Dichlothiazide (Hydrochlorothiazide)

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

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

74. What cation can be detected with Chugaiev's agent (Dimethylglyoxime)?

- a. Ca^{2+}
- b. Mn^{2+}
- c. K^+
- d. Ni^{2+}**
- e. Co^{2+}

75. Which of the listed species of medicinal plants is considered to be a weed?

- a. *Convallaria majalis*
- b. *Mentha piperita*
- c. *Salvia officinalis*
- d. *Papaver somniferum*
- e. ***Plantago major***

76. Select a nucleophile among the particles and molecules given below.

- a. AlCl_3
- b. H^+
- c. CH_3Cl
- d. **NH_3**
- e. NO_2^+

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

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

78. 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. Gonads
- b. Parathyroid glands
- c. Thyroid gland
- d. **Pituitary gland**
- e. Adrenal glands

79. 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 oxidase
- b. Adenosine triphosphate synthetase
- c. Cytochrome C reductase
- d. **NADH-coenzyme Q reductase**
- e. Succinate dehydrogenase

80. In redox titrimetry, the indicators that are added to the reaction system respond to the changes in the:

- a. Degree of ionization of the substance being analyzed
- b. Concentration of hydrogen ions
- c. Ionic strength of the solution
- d. Concentration of hydroxyl ions
- e. **Redox potential of the system**

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

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

82. In the roots of primary structure, the nutrient reserves are stored in the:

- a. **Mesodermis**
- b. Endodermis
- c. Pericycle

- d. Exodermis
- e. Central axial cylinder

83. 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. Cilia
- b. Inclusions
- c. Spores**
- d. Flagella
- e. Capsule

84. 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. Rickettsia
- b. Viruses**
- c. Protozoa
- d. Bacteria
- e. Fungi

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

- a. NaOH
- b. Br_2
- c. Tollens reagent**
- d. FeCl_3
- e. $\text{K}_4[\text{Fe}(\text{CN})_6]$

86. 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. Dexamethasone
- b. Augmentin (Co-amoxiclav)
- c. Loperamide**
- d. Mannitol
- e. Thiamine

87. 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. DNA**
- b. mRNA
- c. Protein
- d. rRNA
- e. tRNA

88. A patient has been hospitalized with signs of carbon monoxide poisoning. What type of hypoxia is characteristic of this condition?

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

89. Який вид лікарських речовин належить до групи бур'янів?

- a. *Mentha piperita*
- b. *Convallaria majalis*
- c. *Plantago major***

- d. *Papaver somniferum*
- e. *Salvia officinalis*

90. *Glycyrrhiza glabra* L., a valuable medicinal plant, is widely used in official and folk medicine. What part of the plant is harvested?

- a. Grass
- b. Leaves
- c. Seeds
- d. Roots with rhizomes**
- e. Inflorescences

91. 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. Analgin (Metamizole)
- b. Paracetamol**
- c. Indomethacin
- d. Nurofen (Ibuprofen)
- e. Aspirin

92. Який збудник викликає захворювання сифіліс?

- a. *Salmonella typhi*
- b. *Mycobacterium tuberculosis*
- c. *Corynebacterium diphtheriae*
- d. *Treponema pallidum***
- e. *Borrelia recurrentis*

93. 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. *Chamomilla recutita*
- b. *Bidens tripartita*
- c. *Arctium lappa*
- d. *Artemisia absinthium***
- e. *Calendula officinalis*

94. 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 C
- c. Phospholipase A2**
- d. Neuraminidase
- e. Phospholipase A1

95. Serology is the leading method of syphilis diagnostics. What test is used to diagnose this disease?

- a. Wright test
- b. Haddelson test
- c. Gruber test
- d. Widal test
- e. Wassermann test**

96. What drug has a hypoglycemic effect due to stimulation of pancreatic beta cells?

- a. Heparin
- b. Adrenaline hydrochloride (epinephrine)
- c. Prednisolone
- d. Retabolil (nandrolone)
- e. Glibenclamide**

97. A doctor has prescribed a nonsteroidal anti-inflammatory drug to relieve inflammation and pain syndrome. Name this drug:

- a. Loratadine
- b. Glibenclamide
- c. Fentanyl
- d. Paracetamol

e. Diclofenac sodium

98. 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. Arginine
- b. Carbamoyl phosphate**
- c. Fumaric acid
- d. Citrulline
- e. Argininosuccinate

99. 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. Oxidants**
- b. Nitrofurans
- c. Dyes
- d. Alcohols
- e. Detergents

100. У чоловіка з діагнозом: цукровий діабет виявили такі показники артеріальної крові: pH крові – 7,25, pCO_2 – 37 мм рт. ст., SB – 19,5 ммоль/л, BB – 39 ммоль/л, BE – (-7) ммоль/л, кетонів тіла крові – 1,9 ммоль/л, титраційна кислотність сечі – 50 ммоль/добу. Яке порушення кислотно-основного стану у пацієнта?

- a. Газовий алкалоз
- b. Газовий ацидоз
- c. Змішаний алкалоз
- d. Змішаний ацидоз
- e. Метаболічний ацидоз**

101. Який пігмент утворюється в реакції окиснення гему?

- a. Стеркобіліноген
- b. Каротин
- c. Білівердин**
- d. Хлорофіл
- e. Уробіліноген

102. В яких структурах рослинних клітин накопичується вторинний крохмаль?

- a. Мітохондріях
- b. Протеопластах
- c. Вакуолях
- d. Амілопластах**
- e. Олеопластах

103. 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. Pharmaceutical incompatibility
- b. Functional antagonism
- c. Pharmacokinetic incompatibility**
- d. Synergism
- e. Pharmacodynamic incompatibility

104. Vitamins can enhance each other's effects, when taken simultaneously. What vitamin potentiates the activity of vitamin P?

- a. C**
- b. D

- c. B_2
- d. B_1
- e. A

105. Action of a number of drugs is based on the effect of competitive inhibition of enzyme activity. Name its characteristic feature.

- a. Inhibitor is a structural analogue of the enzyme
- b. Inhibitor forms strong covalent bonds with the active site of the enzyme
- c. Inhibition degree does not depend on the substrate concentration
- d. Inhibitor has no effect on the enzyme's affinity for its substrate
- e. Inhibitor is a structural analogue of the substrate**

106. Early-flowering rhizomatous ephemeroïds include: *Tussilago farfara*, *Convallaria majalis*, and:

- a. *Chamomilla recutita*
- b. *Allium cepa*
- c. *Carum carvi*
- d. *Adonis vernalis***
- e. *Thymus serpyllum*

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

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

- a. Lycopodiophyta**
- b. Bryophyta
- c. Polypodiophyta
- d. Pinophyta
- e. Equisetophyta

109. 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. *Ledum palustre*
- d. *Urtica dioica*
- e. *Arctostaphylos uva-ursi*

110. 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^+

111. What is the mechanism of action of beta-lactam antibiotics?

- a. Inhibition of cell wall synthesis**
- b. Inhibition of protein synthesis in ribosomes
- c. Inhibition of DNA gyrase
- d. Disruption of DNA synthesis
- e. Inhibition of cytoplasmic membrane synthesis

112. 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. Bilirubin
- c. Urea
- d. Ketone bodies
- e. Uric acid**

113. What drug should be prescribed to a patient with bronchospasm?

- a. Vicasol (Menadione)
- b. Oxytocin
- c. Salbutamol**
- d. Bisacodyl
- e. Insulin

114. Який із нижченаведених антигіпертензивних препаратів призначається пацієнтам із бронхіальною астмою?

- a. Надолол
- b. Анаприлін
- c. Лабеталол
- d. Метопролол**
- e. Фармадипін

115. Synthesis of a medicinal substance occurs in an isolated system. What is a direction criterion of spontaneous processes?

- a. Entropy change**
- b. Gibbs energy
- c. Enthalpy
- d. Intrinsic energy
- e. Helmholtz energy

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

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

117. 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 enterococci in 1 liter of water
- d. Number of coliphages in 1 liter of water
- e. Number of pseudomonads in 1 liter of water

118. 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. Krotov apparatus
- c. Serum-supplemented medium
- d. Pasteur oven
- e. Anaerobic culture jar**

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

- a. Metallochromic indicators
- b. pH indicators**

- c. Adsorption indicators
- d. Chemiluminescent indicators
- e. Redox indicators

120. A patient was prescribed losartan for treatment of arterial hypertension. What mechanism of action does this drug have?

- a. Inhibition of angiotensin-converting enzyme
- b. Activation of central α -adrenoceptors
- c. Inhibition of phosphodiesterase
- d. Calcium channel blockade
- e. Angiotensin-receptor blockade**

121. What has an effect on the coagulating action of the coagulant ion, according to the Schulze-Hardy rule?

- a. Ionic charge**
- b. Hydration ability
- c. Adsorbability
- d. Ionic size
- e. Polarization

122. Для яких систем характерна седиментація?

- a. Золів
- b. Розчинів неелектролітів
- c. Суспензій**
- d. Розчинів ВМР
- e. Розчинів електролітів

123. Sulfanilamides contain a primary aromatic amino group in their structure. What method is used for quantitative determination of these compounds?

- a. Nitritometry**
- b. Iodometry
- c. Dichromatometry
- d. Permanganatometry
- e. Cerimetry

124. 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. *Sorbus aucuparia*
- b. *Viburnum opulus*
- c. *Citrus limon*
- d. *Malus domestica*
- e. *Schisandra chinensis***

125. 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. Valeric acid**
- b. ---
- c. HCl
- d. Urea
- e. NaOH

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

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

127. 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 saprophyticus*
- b. Enterobacteriaceae
- c. *Pseudomonas aeruginosa*
- d. ***Staphylococcus aureus***
- e. *Staphylococcus epidermidis*

128. 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. Lactate
- b. **Acetyl-CoA**
- c. Malate
- d. Succinate
- e. Glucose

129. 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. **Bacteria-excluding filters**
- b. Boiling
- c. Autoclaving
- d. Disinfectants (chloramine)
- e. Ultraviolet irradiation

130. What drug inhibits cholesterol synthesis in the liver?

- a. **Atorvastatin**
- b. Parmidinum
- c. Colestipol
- d. Probucol
- e. Fenofibrate

131. Який патогенез розвитку цукрового діабету 1-го типу?

- a. Гіперпродукція соматотропіну
- b. Гіперпродукція кортизолу
- c. **Аутоімунне ушкодження В-клітин**
- d. Інсулінорезистентність жирової тканини
- e. Гіперпродукція глюкагону

132. Streptomycin like other aminoglycosides, by binding to the 30S subunit of ribosomes, prevents the attachment of formylmethionyl-tRNA) What process is being disrupted as a result of this effect?

- a. **Translation initiation**
- b. Transcription initiation
- c. Translation termination
- d. Transcription termination
- e. Replication initiation

133. До якого виду хроматографії відносять метод газорідинної хроматографії?

- a. Гель-хроматографії
- b. Адсорбційної
- c. **Розподільної**
- d. Іоннообмінної
- e. Афінної

134. 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. Renal colic
- c. Nephrotic syndrome
- d. Tubulopathy
- e. Uremia**

135. 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. Asthenic
- c. Nephrotic**
- d. Toxic
- e. Inflammatory

136. What type of fruit is characteristic of *Atropa belladonna*?

- a. Silique
- b. Legume
- c. Hesperidium
- d. Berry**
- e. Capsule

137. What pharmacological effect of diazepam allows using it in the treatment of neuroses?

- a. Diuretic
- b. Analgesic
- c. Anxiolytic**
- d. Antipyretic
- e. Antidepressant

138. 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. Vicasol (Menadione)
- b. Fibrinogen
- c. Neodicoumarin (ethyl biscoumacetate)
- d. Aminocaproic acid
- e. Protamine sulfate**

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

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

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

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

141. 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. Metaplastic anemia
- b. Iron-deficiency anemia
- c. Hemolytic anemia**
- d. Protein-deficiency anemia
- e. Aplastic anemia

142. 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. Reactive
- b. Cell-mediated
- c. Cytotoxic**
- d. Anaphylactic
- e. Immune complex

143. 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. Conductometry
- c. Calorimetry
- d. Colorimetry
- e. Potentiometry

144. 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. 0.85-0.90% solution of NaCl**
- c. 10% solution of NaCl
- d. 0.9% solution of $MgCl_2$
- e. 10% solution of $CaCl_2$

145. Який спосіб титрування використовують, якщо до розчину досліджуваної речовини додають точно виміряний надлишок допоміжного титранта?

- a. Замісникове титрування
- b. Будь-яке титрування
- c. Титрування за залишком**
- d. Неводне титрування
- e. Пряме титрування

146. Salts and esters of oxalic acid are called:

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

147. 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. To the cathode
- b. First to the cathode, and then to the anode
- c. There will be no movement
- d. First to the anode, and then to the cathode
- e. To the anode**

148. The second stage of detoxification involves joining certain chemical compounds with functional groups of toxins. Select one such compound:

- a. Glucuronic acid**
- b. Higher fatty acids
- c. Glucose

- d. Cholesterol
- e. Pyruvate

149. What family of viruses has a unique reverse transcriptase enzyme?

- a. Picornaviruses
- b. Retroviruses**
- c. Flaviviruses
- d. Reoviruses
- e. Togaviruses

150. *Plantago major* inflorescence grows at the apex, its rachis is long, with sessile flowers. Name this type of inflorescence:

- a. Capitulum
- b. Spike**
- c. Thyse
- d. Spadix
- e. Panicle

151. Від якого показника залежить коагулююча здатність електроліту?

- a. Густини золю
- b. Концентрації електроліту
- c. Ступеня дисперсності золю
- d. Об'єму золю
- e. Заряду іона-коагулятора**

152. During the assessment of air purity in an aseptic unit of a pharmacy, sedimentation analysis resulted in growth of small colonies with areas of hemolysis. What medium was used for inoculation in this case?

- a. Levine formulation (eosin methylene blue agar)
- b. Blood agar**
- c. Ploskirev agar
- d. Egg-yolk salt agar
- e. Endo agar

153. Select ketose from the monosaccharides listed below:

- a. Glucose
- b. Arabinose
- c. Mannose
- d. Fructose**
- e. Ribose

154. A patient suffers from intense cough with production of viscous sputum. What drug can thin the sputum and facilitate expectoration?

- a. Prenoxdiazine
- b. Butamirate
- c. Acetylcysteine**
- d. Glaucine
- e. Codeine phosphate

155. A patient with Cushing syndrome has persistent hyper- \ glycemias and glucosuria. In this case, increased synthesis and secretion of a certain hormone can be observed. What hormone is it?

- a. Cortisol**
- b. Insulin
- c. Glucagon
- d. Adrenaline
- e. Thyroxine

156. What can be used to distinguish formic acid from acetic acid?

- a. $\text{Br}_2(\text{H}_2\text{O})$

- b. NaOH
- c. NaHCO_3
- d. H_2SO_4

e. $[\text{Ag}(\text{NH}_3)_2]\text{OH}$

157. The third analytical 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. HCl
- b. HClO_4
- c. CH_3COOH
- d. HNO_3

e. H_2SO_4

158. A child had been administered antidiphtheric serum. What resistance was formed in the child?

- a. Pathologic
- b. Primary
- c. Active
- d. Physiological

e. Passive

159. 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. Red
- b. Yellow
- c. Green
- d. Blue
- e. Violet

160. What drug is a non-selective beta-blocker?

- a. Prozerin (Neostigmine)
- b. Metoprolol
- c. Adrenaline hydrochloride
- d. Atropine

e. Anaprilin (Propranolol)

161. What reaction can be classified as a pseudo-first-order reaction?

- a. Combustion
- b. Etherification
- c. Saponification
- d. Neutralization

e. Hydrolysis of sucrose

162. 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. *Clostridium perfringens*
- c. *Escherichia coli*
- d. *Salmonella enteritidis*
- e. *Pseudomonas aeruginosa*

163. 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. Tissue hypoxia
- c. Circulatory hypoxia
- d. Respiratory hypoxia
- e. Hemic hypoxia

164. 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. Monocytosis
- b. Basophilic leukocytosis
- c. Neutrophilic leukocytosis**
- d. Lymphocytosis
- e. Eosinophilic leukocytosis

165. Який із патогенетичних факторів відіграє провідну роль у розвитку набряків у пацієнтів після тривалого голодування?

- a. Зниження осмотичного тиску крові
- b. Зниження онкотичного тиску крові**
- c. Підвищення осмотичного тиску інтерстиціальної рідини
- d. Підвищення онкотичного тиску в тканинах
- e. Зниження гідростатичного тиску крові

166. 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. Cholemia
- b. Suprahepatic jaundice
- c. Arterial hypotension
- d. Acholia
- e. Portal hypertension**

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

168. 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. Rubber gloves
- b. Simple nutrient medium
- c. Wire inoculating loops
- d. Glass test tubes**
- e. Physiological solution

169. 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. $N_2(gas) + O_2(gas) = 2NO(gas)$
- d. $NH_4NO_2(solid) = N_2(gas) + 2H_2O(gas)$**
- e. $2H_2S(gas) + 3O_2(gas) = 2SO_2(gas) + 2H_2O(gas)$

170. 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. Solubility of hydroxides in an excess ammonia solution
- c. Solubility of hydroxides in acids
- d. Good solubility of some salts
- e. Amphotericity of hydroxides**

171. Gastric herbal tea contains oval brown lignified "cones" up to 1.5 cm long, which are:

a. *Platycladus orientalis* cones

b. *Alnus* infructescences

c. *Juniperus galbuli*

d. *Cupressus* cones

e. *Larix* cones

172. 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. Isolation of protective antigens from microbial cells

c. Artificial reduction of virulent properties of pathogens

d. Reduction of immunogenicity of the pathogen

e. Inactivation of pathogens while preserving the antigenic structure of cells

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

a. Endodermis

b. Mesodermis

c. Exodermis

d. Pericycle

e. Central axial cylinder

174. 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. Macroaerophiles

b. Facultative anaerobes

c. Microaerophiles

d. Obligate aerobes

e. Obligate anaerobes

175. Який основний метод лабораторної діагностики ВІЛ інфекції?

a. Імуноферментний аналіз

b. Реакція пасивної гемаглютинації

c. Радіоіммунний аналіз

d. Реакція коаглютинації

e. Імунофлуоресцентний

176. 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. Pertussis

b. Measles

c. Diphtheria

d. Tuberculosis

e. Influenza

177. 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. Kidneys

b. Heart

c. Pancreas

d. Lungs

e. Liver

178. Having examined the patient, the doctor made a diagnosis of tick-borne encephalitis. What is the

route of transmission of this disease?

- a. Vector-borne
- b. Vertical
- c. Airborne-droplet
- d. Parenteral
- e. Fecal-oral

179. 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. Calcium chloride
- c. Atropine sulfate
- d. Proserin
- e. Naloxone

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

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

181. 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. Virological method
- c. Immunofluorescence
- d. Bacteriological method

e. Immunoblotting

182. What solution is used to determine the mass-volume fraction of ammonia in a solution?

- a. Sodium hydroxide solution
- b. Iodine solution
- c. Potassium permanganate solution
- d. Sulfuric acid solution

e. Hydrochloric acid solution

183. До якого класу сполук належить Цитохром P450?

- a. Гемопротейн
- b. Нуклеопротейн
- c. Флавопротейн
- d. Піридинопротейн
- e. Ліпопротейн

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

185. Which one of the listed compounds belongs to conjugated dienes?

- a. $\text{CH}_2=\text{C}=\text{CH}-\text{CH}_2-\text{CH}_3$
- b. $\text{CH}_2=\text{C}=\text{CH}_2$
- c. $\text{CH}_2=\text{CH}-\text{C}(\text{CH}_3)_2-\text{CH}=\text{CH}_2$
- d. $\text{CH}_2=\text{CH}-\text{CH}=\text{CH}-\text{CH}_3$

e. $\text{CH}_2=\text{CH}-\text{CH}_2-\text{CH}=\text{CH}_2$

186. 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. Blockade of M1-cholinergic receptors
- b. Blockade of H2-histamine receptors
- c. Stimulation of H^+ , K^+ -ATPase
- d. Irreversible blockade of H^+ , K^+ -ATPase**
- e. Stimulation of H2-histamine receptors

187. Який препарат належить до групи антихолінергічних засобів?

- a. Ацетилхолін
- b. Діпіроксим
- c. Ізонітрозин
- d. Дитилін (суксаметонію хлорид)
- e. Прозерин (неостигмін)**

188. What parameter takes into account the deviation of the properties of a real solution from an ideal one?

- a. Degree of dissociation
- b. Concentration
- c. Isotonic coefficient
- d. Activity**
- e. Fugacity

189. 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. Vibrio cholerae**
- c. Spirochetes
- d. Escherichia coli
- e. Mycobacteria

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

191. An elderly patient suffers from constipation caused by colon hypotonia. What drug should be prescribed?

- a. Castor oil
- b. Bisacodyl**
- c. Sodium sulfate
- d. Novocainamide (Procainamide)
- e. Atropine sulfate

192. A human is immune to the plague of cattle and dogs. What type of immunity is it?

- a. Artificial passive
- b. Natural active
- c. Artificial active
- d. Innate**
- e. Natural passive

193. A dissected flower has numerous stamens that are united by the stamen filaments into several

bundles. What is this type of androecium?

- a. Didynamous
- b. Monadelphous
- c. Tetradynamous
- d. Diadelphous
- e. Polyadelphous**

194. За яким механізмом відбувається приєднання Br_2 до пропену?

- a. A_E**
- b. A_N
- c. S_E
- d. S_N
- e. S_R

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

- a. Cobalamin
- b. Nicotinic acid**
- c. Cholecalciferol
- d. Ascorbic acid
- e. Folic acid

196. 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. Vitamin B1**
- b. Vitamin PP
- c. Pantothenic acid
- d. Vitamin B2
- e. Biotin

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

- a. Umbel
- b. Round capitulum
- c. Flat capitulum**
- d. Spike
- e. Corymb

198. Який препарат належить до групи блокаторів H_2 – гістамінових рецепторів?

- a. Альмагель
- b. Гастроцепін
- c. Фамотидин**
- d. Омепразол
- e. Алохол

199. Name the ability of high-molecular compounds to prevent precipitation of lyophobic sols and deposition of cholesterol plaques on the vessel walls:

- a. Sedimentation
- b. Colloid protection**
- c. Thixotropy
- d. Coagulation
- e. Coacervation

200. How many stereoisomeric aldohexoses exist?

- a. 6
- b. 16**
- c. 2
- d. 8

e. 4

201. Rhizome of a species belonging to the Asteraceae family is polycephalous, succulent, has lysigenous cavities, accumulates inulin. Such underground organ is characteristic of:

- a. **Inula helenium**
- b. Helianthus annuus
- c. Sorbus aucuparia
- d. Hyoscyamus niger
- e. Digitalis grandiflora

202. Coumarins, vitamin K antagonists, suppress the processes of blood coagulation. Synthesis of what protein is blocked by coumarins?

- a. Gamma globulin
- b. Albumin
- c. Ceruloplasmin
- d. **Prothrombin**
- e. Transferrin

203. 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. Recuperation
- b. **Adsorption**
- c. Cohesion
- d. Adhesion
- e. Desorption

204. Первинні та вторинні нітроалкани є таутомерними сполуками. Яка таутомерія характерна для них?

- a. **Аци-нітротаутомерія**
- b. Лактам-лактимна
- c. Азольна
- d. Кето-енольна
- e. Аміно-імінна

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

- a. Amperometry
- b. Electrolysis
- c. **Potentiometry**
- d. Polarography
- e. Conductometry

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

- a. Eriochrome black T
- b. Diphenylamine
- c. **Phenolphthalein**
- d. Diphenylcarbazone
- e. Murexide

207. Який механізм інгібіторної дії неостигміну (прозерину)?

- a. Ковалентне зв'язування поза активним центром фермента
- b. Ковалентне зв'язування з субстратом ферменту
- c. Окиснення іона заліза в активном у центрі фермента
- d. **Конкуренція з ацетилхоліном за активний центр фермента**
- e. Денатурація фермента

208. Thiocyanatometric titration method requires secondary standard solution of potassium thiocyanate that is standardized with standard solution of:

- a. Hydrochloric acid

b. Iron (II) sulfate

c. Silver nitrate

d. Sulfuric acid

e. Copper (II) nitrate

209. 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. $[\text{Ag}(\text{NH}_3)_2]\text{Cl}$

b. AgOH

c. $[\text{Ag}_2(\text{NH}_3)_3]\text{Cl}$

d. $[\text{Ag}(\text{NH}_3)_3]\text{Cl}$

e. AgCl

210. Caffeine is one of the alkaloids contained in tea and coffee. Caffeine is contraindicated in case of:

a. Migraine

b. Addiction

c. Hypotension

d. Essential hypertension

e. Depression of nervous activity

211. 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. Viruses

b. Protozoa

c. Viroids

d. Mycoplasma

e. Microfungi

212. Cosmetic cream against mimic wrinkles contains "vitamin Q10" --- ubiquinone. What is the metabolic role of this vitamin-like substance?

a. It regulates differentiation of epithelial cells

b. It stimulates collagen synthesis

c. It regulates water-salt exchange

d. It is a component of the mitochondrial respiratory chain

e. It decreases permeability of cell membranes

213. What type of cardiac arrhythmia occurs as a result of simultaneous disruption of excitability and conduction functions?

a. Respiratory arrhythmia

b. Sinus tachycardia

c. Extrasystole

d. Atrial fibrillation

e. Atrioventricular block

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

a. 5 times

b. 1.5 times

c. 10 times

d. Temperature does not affect reaction rate

e. 2--4 times

215. Яким методом здійснюють кількісне визначення вісмуту в препараті?

a. Аргентометрії

b. Комплексонометрії

c. Меркуриметрії

d. Перманганатометрії

e. Йодометрії

216. A patient complains of loss of appetite, weight loss, weakness, and abdominal pain. Laboratory blood test shows the following: Hb --- 90 g/L; erythrocytes --- $2.0 \cdot 10^{12}/L$; color index --- 1.4. B₁₂ deficiency anemia has been diagnosed. What substance is deficient in this patient, causing the anemia?

a. Hydrochloric acid

b. Secretin

c. Castle factor

d. Renin

e. Pepsin

217. What reaction occurs according to the free-radical (SR) mechanism?

a. $C_2H_6 + Cl_2$

b. $CH_3-CH_3 + O_2$

c. $C_6H_6 + Cl_2$

d. $CH_2=CH_2 + Cl_2$

e. $CH_3CH_2OH + HCl$

218. 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. Dioecious

b. Monoecious

c. Unisexual

d. Polyecious

e. Monandrous