

1. 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. Microfungi

c. Viroids

d. Protozoa

e. Viruses

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

a. Діазепам

b. Аміназин (хлорпромазин)

c. Анальгін (метамізол натрію)

d. Кофеїн-бензоат натрію

e. Амітриптилін

3. Яким методом здійснюють кількісне визначення вісмуту в препараті?

a. Йодометрії

b. Аргентометрії

c. Комплексонометрії

d. Меркуриметрії

e. Перманганатометрії

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

a. *Convallaria majalis*

b. *Papaver somniferum*

c. *Plantago major*

d. *Mentha piperita*

e. *Salvia officinalis*

5. 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. Basophilic leukocytosis

b. Eosinophilic leukocytosis

c. Neutrophilic leukocytosis

d. Monocytosis

e. Lymphocytosis

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

a. Підвищення онкотичного тиску в тканинах

b. Зниження гідростатичного тиску крові

c. Підвищення осмотичного тиску інтерстиціальної рідини

d. Зниження осмотичного тиску крові

e. Зниження онкотичного тиску крові

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

a. Spike

b. Thyse

c. Panicle

d. Spadix

e. Capitulum

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

a. Strong reducing agents

b. Strong oxidizing agents

c. Unsaturated hydrocarbons

- d. Weak reducing agents
- e. Saturated hydrocarbons

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

- a. Physiological
- b. Active
- c. Primary
- d. Pathologic
- e. Passive**

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

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

11. 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. Cr(III) ions**
- d. As(III) ions
- e. Al(III) ions

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

- a. NaHCO_3
- b. $[\text{Ag}(\text{NH}_3)_2]\text{OH}$**
- c. NaOH
- d. $\text{Br}_2 (\text{H}_2\text{O})$
- e. H_2SO_4

13. 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. rRNA
- c. Protein
- d. mRNA
- e. tRNA

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

15. Який механізм інгібіторної дії неостигміну (прозерину)?

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

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

such vaccines?

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

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

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

19. 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 is a structural analogue of the enzyme
- c. Inhibitor forms strong covalent bonds with the active site of the enzyme
- d. Inhibitor is a structural analogue of the substrate**
- e. Inhibitor has no effect on the enzyme's affinity for its substrate

20. 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. Malate
- c. Acetyl-CoA**
- d. Glucose
- e. Succinate

21. What drug inhibits cholesterol synthesis in the liver?

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

22. 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 $\text{H}^+ + \text{K}^+ \text{ ATPase}$ activity
- b. Muscarinic cholinoreceptor blockade
- c. H_1 -histamine receptors blockade
- d. H_2 -histamine receptors blockade**
- e. Cholinergic receptors blockade in the sympathetic ganglia

23. 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. Funneliform

b. Papilionaceous

c. Saucer-shaped

d. Labiate

e. Tubular

24. Which of the listed plants is a bush with imparipinnate leaves, decussate leaf arrangement, and juicy black fruits?

a. Sambucus nigra

b. Arctostaphylos uva-ursi

c. Chelidonium majus

d. Urtica dioica

e. Ledum palustre

25. 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. Cholesterol

d. Glucose

e. Pyruvate

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

a. Cozaar (Losartan)

b. Atenolol

c. Amlodipine

d. Hydrochlorothiazide

e. Enalapril

27. 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. Irreversible blockade of H^+ , K^+ -ATPase

b. Blockade of M1-cholinergic receptors

c. Stimulation of H^+ , K^+ -ATPase

d. Blockade of H2-histamine receptors

e. Stimulation of H2-histamine receptors

28. 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. Hemolytic anemia

c. Metaplastic anemia

d. Protein-deficiency anemia

e. Iron-deficiency anemia

29. 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. Increased bactericidal action of silver

c. Protection of colloid solution against coagulation

d. Decreased side effects

e. Increased storage time

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

a. Benzene

- b. Naphthalene
- c. Phenanthrene
- d. Anthracene

e. Cyclohexene

31. 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. Hemic hypoxia

e. Circulatory hypoxia

32. 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. Violet
- b. Yellow
- c. Green
- d. Blue

e. Red

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

a. Spores

b. Capsule

c. Inclusions

d. Flagella

e. Mesosomes

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

- a. Silique
- b. Legume
- c. Hesperidium
- d. Capsule

e. Berry

35. 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. Tin(II) cations
- b. Mercury(I) cations
- c. Lead(II) cations

d. Silver(I) cations

e. Mercury(II) cations

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

- a. Metoprolol
- b. Prozerin (Neostigmine)

c. Anaprilin (Propranolol)

d. Adrenaline hydrochloride

e. Atropine

37. 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. Blood agar

b. Endo agar

c. Egg-yolk salt agar

- d. Levine formulation (eosin methylene blue agar)
- e. Ploskirev agar

38. How many stereoisomeric aldohexoses exist?

- a. 6
- b. 4
- c. 2
- d. 16
- e. 8

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

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

40. 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. Ba^{2+}
- b. Ca^{2+}
- c. Sr^{2+}
- d. Na^{+}
- e. K^{+}

41. Water samples were received by a bacteriological laboratory for determining their coli index. What is the coli index?

- a. Number of enterococci 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 Escherichia coli in 1 liter of water
- e. Number of pseudomonads in 1 liter of water

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

- a. Superficial phenomena
- b. Optical phenomena
- c. Electrokinetic phenomena
- d. Physico-chemical phenomena
- e. Molecular-kinetic phenomena

43. У чоловіка з діагнозом: цукровий діабет виявили такі показники артеріальної крові: рН 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 ацидоз
- b. Змішаний алкалоз
- c. Метаболічний ацидоз
- d. Змішаний ацидоз
- e. Газовий алкалоз

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

45. Від якого показника залежить коагулююча здатність електроліту?

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

46. 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. *Escherichia coli*
- b. *Streptococcus faecalis*
- c. *Clostridium perfringens***
- d. *Pseudomonas aeruginosa*
- e. *Salmonella enteritidis*

47. 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

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

49. 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. Monoecious**
- c. Dioecious
- d. Unisexual
- e. Monandrous

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

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

e. To the cathode

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

- a. Respiratory arrhythmia
- b. Extrasystole
- c. Atrioventricular block
- d. Atrial fibrillation**
- e. Sinus tachycardia

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

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

54. Який пігмент утворюється в реакції окиснення гему?

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

55. 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. Propanal and formic acid**
- d. Propanol and formic acid
- e. Acetic acid and formic acid

56. 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. Circulatory**
- b. Hypoxic
- c. Hemic
- d. Anemic
- e. Tissue

57. В яких структурах рослинних клітин накопичується вторинний крохмаль?

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

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

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

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

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

60. 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. Measles
- b. Tuberculosis
- c. Influenza
- d. Pertussis
- e. Diphtheria**

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

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

62. 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 A2**
- b. Phospholipase C
- c. Neuraminidase
- d. Phospholipase D
- e. Phospholipase A1

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

- a. It stimulates collagen synthesis
- b. It is a component of the mitochondrial respiratory chain**
- c. It decreases permeability of cell membranes
- d. It regulates differentiation of epithelial cells
- e. It regulates water-salt exchange

64. Який основний метод лабораторної діагностики ВІЛ інфекції?

- a. Імуноферментний аналіз**
- b. Реакція пасивної гемаглютинації
- c. Радіоімунний аналіз
- d. Імунофлуоресцентний
- e. Реакція коагуляції

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

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

66. 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. Protozoa
- c. Viruses**
- d. Bacteria
- e. Fungi

67. 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. Nephrotic**
- b. Asthenic
- c. Inflammatory
- d. Toxic
- e. Hypertensive

68. 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. H_2SO_4**
- c. CH_3COOH
- d. HClO_4
- e. HNO_3

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

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

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

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

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

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

72. 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. Artificial reduction of virulent properties of pathogens**
- c. Inactivation of pathogens while preserving the antigenic structure of cells
- d. Reduction of immunogenicity of the pathogen
- e. Isolation of protective antigens from microbial cells

73. People, who were indoors during a fire, suffer from a carbon monoxide poisoning. What type of hypoxia is observed in such cases?

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

74. A dissected flower has numerous stamens that are united by the stamen filaments into several bundles. What is this type of androecium?

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

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

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

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

77. 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. Aluminium**
- b. Calcium
- c. Barium
- d. Sodium
- e. Potassium

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

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

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

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

- a. Reoviruses
- b. Retroviruses**
- c. Flaviviruses

- d. Picornaviruses
- e. Togaviruses

81. 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. Anaerobic culture jar
- d. Serum-supplemented medium
- e. Krotov apparatus

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

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

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

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

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

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

85. Having examined the patient, the doctor made a diagnosis of tick-borne encephalitis. What is the route of transmission of this disease?

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

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

- a. Renin
- b. Castle factor
- c. Secretin
- d. Pepsin
- e. Hydrochloric acid

87. За яким механізмом відбувається приєднання Br₂ до пропену?

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

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

- a. Iodine solution

- b. Sulfuric acid solution
- c. Potassium permanganate solution
- d. Hydrochloric acid solution**
- e. Sodium hydroxide solution

89. 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. Microaerophiles
- b. Obligate anaerobes**
- c. Macroaerophiles
- d. Facultative anaerobes
- e. Obligate aerobes

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

- a. Isoniazid**
- b. Para-aminosalicylate sodium
- c. Benzylpenicillin sodium
- d. Rifampicin
- e. Ceftriaxone

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

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

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

93. In E. coli cells, the synthesis of pyrimidine nucleotides occurs according to the scheme of the metabolic pathway: $\text{CO}_2 + \text{NH}_3 + 2\text{ATP} \rightarrow \text{S1} \rightarrow \text{S2} \rightarrow \text{UTP} \rightarrow \text{CTP}$. When CTP concentration in the cell increases, the synthesis of pyrimidine nucleotides stops. What type of regulation is described here?

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

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

95. Early-flowering rhizomatous ephemeroids include: Tussilago farfara, Convallaria majalis, and:

- a. Thymus serpyllum
- b. Chamomilla recutita
- c. Carum carvi

d. *Allium cepa*

e. *Adonis vernalis*

96. 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

97. 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. Equisetiphyta

b. Lycopodiophyta

c. Bryophyta

d. Pinophyta

e. Polypodiophyta

98. 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. AgCl

b. AgOH

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

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

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

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

a. Natural passive

b. Innate

c. Natural active

d. Artificial active

e. Artificial passive

100. 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. Testosterone

c. Cortisol

d. Glucagon

e. Insulin

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

a. Wassermann test

b. Gruber test

c. Haddelson test

d. Wright test

e. Widal test

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

a. Etherification

b. Saponification

c. Combustion

d. Hydrolysis of sucrose

e. Neutralization

103. 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. Thoracic diaphragm
- c. Obstructive
- d. Central

e. Restrictive

104. 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. Delayed-type hypersensitivity
- c. Autoallergic

d. Anaphylactic

- e. Immune complex

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

a. Метопролол

- b. Фармадипін
- c. Анаприлін
- d. Надолол
- e. Лабеталол

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

a. Methyl orange

- b. Diphenylamine
- c. Methylene blue
- d. Ferroin
- e. Murexide

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

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

a. Coagulation

b. Colloid protection

- c. Coacervation
- d. Sedimentation
- e. Thixotropy

109. 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. Plantlets
- c. Germinated seeds
- d. Leaf cuttings

e. Parts of the rhizome

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

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

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

112. 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. Acholia
- c. Suprahepatic jaundice
- d. Arterial hypotension
- e. Portal hypertension**

113. До якого класу сполук належить Цитохром P450?

- a. Піридинопротеїн
- b. Флавопротеїн
- c. Ліпопротеїн
- d. Нуклеопропротеїн
- e. Гемопропротеїн**

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

- a. Green
- b. White**
- c. Blue
- d. Red
- e. Yellow

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

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

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

117. 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. Adjuvant
- b. Immunoglobulin

- c. Inactivated vaccine
- d. Antitoxic serum

e. Anatoxin

118. 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. Escherichia coli
- d. Spirochetes
- e. Mycobacteria

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

- a. Pericycle
- b. Central axial cylinder

c. Mesodermis

- d. Endodermis
- e. Exodermis

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

a. Oropharyngeal candidiasis

- b. Increased body mass
- c. Arterial hypertension
- d. Osteoporosis
- e. Subcapsular cataract

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

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

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

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

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

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

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

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

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

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

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

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

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

129. 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. Inflorescences
- c. Seeds
- d. Roots with rhizomes**
- e. Leaves

130. What transformation is accompanied by an increase in entropy?

- a. $\text{N}_2(\text{gas}) + \text{O}_2(\text{gas}) = 2\text{NO}(\text{gas})$
- b. $\text{C}_2\text{H}_2(\text{gas}) + \text{H}_2(\text{gas}) = \text{C}_2\text{H}_4(\text{gas})$
- c. $\text{NH}_4\text{-NO}_2(\text{solid}) = \text{N}_2(\text{gas}) + 2\text{H}_2\text{O}(\text{gas})$**
- d. $\text{CaO}(\text{solid}) + \text{CO}_2(\text{gas}) = \text{CaCO}_3(\text{solid})$
- e. $2\text{H}_2\text{S}(\text{gas}) + 3\text{O}_2(\text{gas}) = 2\text{SO}_2(\text{gas}) + 2\text{H}_2\text{O}(\text{gas})$

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

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

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

- a. Platycladus orientalis cones
- b. Juniperus galbuli
- c. Alnus infructescences**

- d. Cupressus cones
- e. Larix cones

133. 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. Aspirin
- b. Analgin (Metamizole)
- c. Nurofen (Ibuprofen)
- d. Indomethacin

e. Paracetamol

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

- a. Hexane and cyclohexane
- b. Benzene and methylbenzene
- c. Butane and isobutane

d. Propanal and propanone

- e. Pentene-1 and pentene-2

135. 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. Thyroxine
- b. Insulin

c. Cortisol

- d. Glucagon
- e. Adrenaline

136. Для яких систем характерна седиментація?

- a. Розчинів ВМР
- b. Розчинів неелектролітів
- c. Золів
- d. Розчинів електролітів

e. Суспензій

137. 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. Amphotericity of hydroxides

- b. Solubility of hydroxides in acids
- c. Good solubility of some salts
- d. Insolubility of salts in water
- e. Solubility of hydroxides in an excess ammonia solution

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

a. Flat capitulum

- b. Umbel
- c. Corymb
- d. Spike
- e. Round capitulum

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

- a. Аміно-імінна
- b. Кето-енольна

c. Аци-нітротаутомерія

- d. Лактам-лактимна
- e. Азольна

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

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

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

142. Essential oils are used both in pharmaceutical and cosmetic industry. To extract essential oils from herbal raw material the following technology is used:

- a. Colorimetry
- b. Calorimetry
- c. Potentiometry
- d. Conductometry
- e. Steam distillation**

143. 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. Uric acid**
- b. Urea
- c. Ketone bodies
- d. Lactate
- e. Bilirubin

144. 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. Rubber gloves
- d. Simple nutrient medium
- e. Glass test tubes**

145. 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. Jelly
- b. Emulsion**
- c. Diaphragm
- d. Gel
- e. Membrane

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

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

147. 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. Synergism

- c. Pharmacodynamic incompatibility
- d. Pharmaceutical incompatibility
- e. Functional antagonism

148. 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. Lungs
- b. Pancreas
- c. Kidneys
- d. Heart
- e. Liver

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

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

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

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

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

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

- a. Chemiluminescent indicators
- b. Adsorption indicators
- c. pH indicators
- d. Metallochromic indicators
- e. Redox indicators

153. Який механізм передачі захворювання епідемічного висипного тифу?

- a. Вертикальний
- b. Повітряно-крапельний
- c. Парентеральний
- d. Трансмісивний
- e. Фекально-оральний

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

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

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

- a. Thermal energy
- b. Mechanical energy
- c. Electromagnetic energy
- d. Nuclear energy

e. Electrical energy

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

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

157. Salts and esters of oxalic acid are called:

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

158. 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. Furosemide
- b. Atenolol
- c. Lisinopril
- d. Nifedipine
- e. Dichlothiazide (Hydrochlorothiazide)

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

- a. Fentanyl
- b. Glibenclamide
- c. Loratadine
- d. Paracetamol
- e. Diclofenac sodium

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

- a. $\text{CH}_2=\text{CH}_2+\text{Cl}_2$
- b. $\text{CH}_3-\text{CH}_3+\text{O}_2$
- c. $\text{CH}_3\text{CH}_2\text{OH}+\text{HCl}$
- d. $\text{C}_6\text{H}_6+\text{Cl}_2$
- e. $\text{C}_2\text{H}_6+\text{Cl}_2$

161. 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. Copper (II) nitrate
- d. Sulfuric acid
- e. Silver nitrate

162. 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. Fibrinogen
- b. Vicasol (Menadione)
- c. Protamine sulfate

- d. Neodicoumarin (ethyl biscoumacetate)
- e. Aminocaproic acid

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

- a. Quinhydrone electrode
- b. Silver chloride electrode**
- c. Antimony electrode
- d. Zinc electrode
- e. Glass electrode

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

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

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

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

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

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

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

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

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

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

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

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

- a. Strophanthin K
- b. Digitoxin
- c. Adoniside

d. Corglycon

- e. Celanid (Lanatoside C)

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

e. Decreased oncotic blood pressure

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

- a. 0.9% solution of $MgCl_2$
- b. 10% solution of $CaCl_2$
- c. 4.5-5.0% glucose solution

d. 0.85-0.90% solution of NaCl

- e. 10% solution of NaCl

173. Який препарат належить до групи антихолінергічних засобів?

- a. Діпіроксим
- b. Ацетилхолін

c. Прозерин (неостигмін)

- d. Дитилін (суксаметонію хлорид)
- e. Ізонітрозин

174. 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. Protein biosynthesis

- c. Genetic recombination
- d. DNA repair
- e. DNA replication

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

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

e. Ni^{2+}

176. 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. Formaldehyde solution
- d. Brilliant green
- e. Copper sulfate

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

- a. Неводне титрування

b. Титрування за залишком

- c. Будь-яке титрування
- d. Пряме титрування
- e. Замісникове титрування

178. 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. Bacteriological method
- d. Virological method
- e. Immunofluorescence

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

- a. Renal colic
- b. Acute renal failure
- c. Uremia**
- d. Nephrotic syndrome
- e. Tubulopathy

180. До якого виду хроматографії відносять метод газорідинної хроматографії?

- a. Розподільної**
- b. Гель-хроматографії
- c. Афинної
- d. Адсорбційної
- e. Іоннобмінної

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

182. 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. Sorbus aucuparia
- c. Hyoscyamus niger
- d. Digitalis grandiflora
- e. Helianthus annuus

183. Який збудник викликає захворювання сифіліс?

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

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

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

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

- a. B₁
- b. C**

- c. \$B_2\$
- d. D
- e. \$A\$

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

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

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

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

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

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

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

- a. Tricarboxylic acid cycle
- b. Pentose-phosphate pathway
- c. Urea cycle
- d. Anaerobic glycolysis**
- e. Oxidative decarboxylation of keto acids

191. 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. Metastasis
- d. Invasion in surrounding tissues
- e. Infiltrating growth

192. 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. Nitrofurans
- b. Dyes
- c. Oxidants**
- d. Detergents

e. Alcohols

193. 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. Diploid
- b. Polyploid
- c. Tetraploid
- d. Haploid**
- e. Triploid

194. 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. Pepsin
- c. Amylase**
- d. Creatine kinase
- e. Lactate dehydrogenase

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

- a. Mirror (optical) isomers
- b. Geometric (cis-trans) isomers
- c. Tautomers
- d. Carbon chain isomers
- e. Functional group isomers**

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

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

197. 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. Gelatine
- b. Biological membrane
- c. Collodion film
- d. Parchment
- e. Glass**

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

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

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

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

- a. Minimum

b. Equal to atmospheric pressure

- c. Maximum
- d. Equal to saturated vapor pressure at room temperature
- e. Equal to saturated vapor pressure at 273 K

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

- a. Lipases
- b. Proteases**

- c. Phosphatases
- d. Dehydrogenases
- e. Amylases

202. 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. Cortical fibers
- d. Pericyclic fibers
- e. Phloem fibers

203. Select ketose from the monosaccharides listed below:

- a. Glucose
- b. Mannose

c. Fructose

- d. Arabinose
- e. Ribose

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

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

205. 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. General
- c. Non-specific
- d. Immunotropic
- e. Specific passive**

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

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

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

- a. Blocks virus stripping
- b. Blocks virus protein synthesis**
- c. Disrupts the process of virus assembly
- d. Prevents adsorption of virus in cell receptors
- e. Inhibits virion exit from cells

208. 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. Albumin
- c. Glucose
- d. Cholesterol
- e. Amylase

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

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

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

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

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

212. The method consisting in removal of low-molecular impurities from colloidal systems and high-molecular compound solutions by semipermeable membrane diffusion is called:

- a. Compensatory dialysis
- b. Ultrafiltration
- c. Decantation
- d. Dialysis
- e. Electrodialysis

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

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

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

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

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

- a. Suspensions
- b. Powders
- c. Emulsions

- d. Aerosols
- e. Foams

216. During photosynthesis within plant cell chloroplasts there is short-term retained starch being produced, which rapidly hydrolyzes into glucose. This starch is called:

- a. Transitory
- b. Primary**
- c. Resistant
- d. Secondary
- e. Reserve

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

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

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