

1. 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. Metastasis
- b. Infiltrating growth
- c. Cancer cachexia
- d. Invasion in surrounding tissues
- e. Expansive growth**

2. 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. Coordination catalysis
- d. Enzyme catalysis**
- e. Redox catalysis

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

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

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

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

5. 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. Transitory
- c. Reserve
- d. Secondary
- e. Resistant

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

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

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

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

8. Select ketose from the monosaccharides listed below:

- a. Arabinose
- b. Ribose

c. Fructose

d. Mannose

e. Glucose

9. 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. Tubular

b. Labiate

c. Papilionaceous

d. Funnelform

e. Saucer-shaped

10. 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. Glucose

b. Amylase

c. Bilirubin

d. Albumin

e. Cholesterol

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

a. Aerosols

b. Foams

c. Powders

d. Suspensions

e. Emulsions

12. 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. Non-specific

b. Specific passive

c. Specific active

d. General

e. Immunotropic

13. 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. Brilliant green

c. Copper sulfate

d. Formaldehyde solution

e. Iodine alcoholic solution

14. A solution contains calcium, barium, aluminium, potassium, and sodium cations. Into this solution a small amount of ammonium hydroxide and alizarin solution was added, which resulted in production of red precipitate. What ion was detected as the result of this reaction?

a. Sodium

b. Potassium

c. Barium

d. Calcium

e. Aluminium

15. 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. Collodion film

b. Glass

c. Gelatine

- d. Biological membrane
- e. Parchment

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

17. 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. Lactate dehydrogenase
- c. Creatine kinase
- d. Aldolase
- e. Pepsin

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

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

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

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

20. 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. Disrupts the process of virus assembly
- c. Blocks virus protein synthesis**
- d. Blocks virus stripping
- e. Inhibits virion exit from cells

21. 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. Membrane
- c. Gel
- d. Diaphragm
- e. Emulsion**

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

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

23. In cases of severe pancreatitis, physicians usually prescribe the drugs that help prevent

pancreatic autolysis. These drugs inhibit the following type of enzymes:

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

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

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

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

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

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

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

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

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

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

- a.  $\text{NO}_2^+$
- b.  $\text{CH}_3\text{Cl}$
- c.  $\text{NH}_3$**
- d.  $\text{AlCl}_3$
- e.  $\text{H}^+$

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

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

31. 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. Endonuclease
- c. Helicase
- d. DNA-ligase

**e. Reverse transcriptase**

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

- a. Electrodialysis
- b. Compensatory dialysis
- c. Decantation

**d. Dialysis**

- e. Ultrafiltration

33. In the process of asexual reproduction, higher spore-forming plants have the ability to form spores, which is an adaptation to life on dry land. What set of chromosomes do their spores have?

- a. Tetraploid

**b. Haploid**

- c. Diploid
- d. Polyploid
- e. Triploid

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

**a. Aluminum, zinc, chromium(II), tin(II), tin(IV), arsenic(III), arsenic(V)**

- b. Magnesium, calcium, strontium, barium
- c. Silver, lead, nickel, potassium, barium, bismuth
- d. Sodium, potassium, ammonium, silver, lead
- e. Calcium, strontium, barium, potassium, bismuth

35.  $\text{CH}_3\text{-CH}_2\text{-OH}$  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. Carbon chain isomers

**d. Functional group isomers**

- e. Tautomers

36. 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. Biot
- e. Gasping

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

**a. Plantago major**

- b. Salvia officinalis
- c. Mentha piperita
- d. Convallaria majalis
- e. Papaver somniferum

38. Яким методом здійснюють кількісне визначення вісмуту в препараті?

- a. Йодометрії
- b. Меркуриметрії
- c. Перманганатометрії

**d. Комплексонометрії**

e. Аргентометрії

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

a. Fecal-oral transmission

b. Airborne droplet transmission

**c. Vector-borne transmission**

d. Parenteral transmission

e. Vertical transmission

40. 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. Stem

d. Rhizome

e. Seed

41. Який препарат належить до групи антихолінестеразних засобів?

a. Діпіроксим

b. Ацетилхолін

c. Дитилін (суксаметонію хлорид)

d. Ізонітрозин

**e. Прозерин (неостигмін)**

42. 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. Metamizole

c. Paracetamol

**d. Celecoxib**

e. Acetylsalicylic acid

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

a. Prozerin (Neostigmine)

b. Atropine

c. Adrenaline hydrochloride

d. Metoprolol

**e. Anaprilin (Propranolol)**

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

a. Hesperidium

b. Capsule

c. Legume

**d. Berry**

e. Silique

45. Який механізм інгібіторної дії неостигміну (прозерину)?

a. Ковалентне зв'язування з субстратом ферменту

b. Ковалентне зв'язування поза активним центром фермента

c. Окиснення іона заліза в активном у центрі фермента

d. Денатурація фермента

**e. Конкуренція з ацетилхоліном за активний центр фермента**

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

a. Chemiluminescent indicators

b. Metallochromic indicators

c. Redox indicators

**d. pH indicators**

e. Adsorption indicators

47. Для яких систем характерна седиментація?

a. Розчинів неелектролітів

**b. Суспензій**

c. Розчинів електролітів

d. Розчинів ВМР

e. Золів

48. 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. Increased storage time

b. Improved preparation technology

**c. Protection of colloid solution against coagulation**

d. Increased bactericidal action of \\ silver

e. Decreased side effects

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

a. Active

b. Primary

**c. Passive**

d. Physiological

e. Pathologic

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

**a. Capsule**

b. Mesosomes

c. Flagella

d. Inclusions

e. Spores

51. У чоловіка з діагнозом: цукровий діабет виявили такі показники артеріальної крові: рН крові – 7,25, рCO<sub>2</sub> – 37 мм рт. ст., SB – 19,5 ммоль/л, BB – 39 ммоль/л, BE – (-7) ммоль/л, кетонові тіла крові – 1,9 ммоль/л, титраційна кислотність сечі – 50 ммоль/добу. Яке порушення кислотно-основного стану у пацієнта?

a. Змішаний алкалоз

b. Газовий алкалоз

**c. Метаболічний ацидоз**

d. Газовий ацидоз

e. Змішаний ацидоз

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

**a. Hydrochlorothiazide**

b. Cozaar (Losartan)

c. Enalapril

d. Atenolol

e. Amlodipine

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

a. Iron (II) sulfate

b. Copper (II) nitrate

**c. Silver nitrate**

d. Sulfuric acid

e. Hydrochloric acid

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

- a. Natural active
- b. Artificial passive
- c. Natural passive

**d. Innate**

e. Artificial active

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

- a. Flaviviruses
- b. Picornaviruses

**c. Retroviruses**

- d. Reoviruses
- e. Togaviruses

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

a. Antidepressant

**b. Anxiolytic**

- c. Diuretic
- d. Analgesic
- e. Antipyretic

57. 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. Lisinopril**

- c. Atenolol
- d. Furosemide
- e. Dichlothiazide (Hydrochlorothiazide)

58. До якого класу сполук належить Цитохром P450?

- a. Флавопротеїн
- b. Нуклеопроетїн
- c. Ліпопротеїн

**d. Гемопроетїн**

e. Піридинопротеїн

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

a. Novocainamide (Procainamide)

**b. Bisacodyl**

- c. Castor oil
- d. Sodium sulfate
- e. Atropine sulfate

60. In medical practice barbiturates are used as sleeping pills. These substances act similar to rothenone and are inhibitors of tissue respiration. The mechanism of their action takes place on the enzymatic level. Which of the following enzymes do these substances inhibit?

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

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

**a. Temperature and volume**

- b. Entropy and pressure
- c. Entropy and volume



- d. Temperature and pressure
- e. Internal energy and volume

62. 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. Yellow
- b. Violet
- c. Blue
- d. Green
- e. Red**

63. 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.  $[\text{Ag}(\text{NH}_3)_3]\text{Cl}$
- c.  $\text{AgCl}$
- d.  $[\text{Ag}_2(\text{NH}_3)_3]\text{Cl}$
- e. AgOH

64. 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. Carbamoyl phosphate**
- c. Arginine
- d. Argininosuccinate
- e. Fumaric acid

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

- a. Strophanthin K
- b. Digitoxin
- c. Celanid (Lanatoside C)
- d. Adoniside
- e. Corglycon**

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

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

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

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

e. *Plantago major*

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

a. Glass electrode

b. Silver chloride electrode

c. Antimony electrode

d. Quinhydrone electrode

e. Zinc electrode

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

a. Sinus tachycardia

b. Atrial fibrillation

c. Respiratory arrhythmia

d. Extrasystole

e. Atrioventricular block

71. A woman, who works at a factory that produces phenylhydrazine, came to a hospital with complaints of general weakness, dizziness, and drowsiness. Her blood has signs of anemia with high levels of reticulocytosis, anisocytosis, and poikilocytosis; isolated normocytes are present in the woman's blood. What type of anemia is it?

a. Aplastic anemia

b. Protein-deficiency anemia

c. Iron-deficiency anemia

d. Metaplastic anemia

e. Hemolytic anemia

72. 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.  $H_1$ -histamine receptors blockade

c.  $H_2$ -histamine receptors blockade

d. Muscarinic cholinoreceptor blockade

e. Cholinergic receptors blockade in the sympathetic ganglia

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

a. Diphenylamine

b. Ferroin

c. Methylene blue

d. Murexide

e. Methyl orange

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

a. *Juniperus galbuli*

b. *Larix* cones

c. *Platycladus orientalis* cones

d. *Alnus* infructescences

e. *Cupressus* cones

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

a. Пряме титрування

b. Титрування за залишком

c. Будь-яке титрування

d. Неводне титрування

e. Замісникове титрування

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

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

77. До якого виду хроматографії відносять метод газорідинної хроматографії?

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

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

- a. Ethane and oxygen
- b. Ethane and chlorine in the light**
- c. Ethanol and hydrogen chloride
- d. Ethylene and chlorine
- e. Benzene and chlorine in the presence of  $\text{AlCl}_3$

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

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

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

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

81. How many stereoisomeric aldohexoses exist?

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

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

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

83. 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.  $\text{B}_{12}$  deficiency anemia has been diagnosed. What substance is deficient in this patient, causing the anemia?

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

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

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

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

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

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

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

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

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

88. 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. Airborne-droplet
- c. Vector-borne**
- d. Fecal-oral
- e. Vertical

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

- a. Essential hypertension**
- b. Depression of nervous activity
- c. Addiction
- d. Hypotension
- e. Migraine

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

91. 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. Concentration of hydroxyl ions

**d. Redox potential of the system**

e. Degree of ionization of the substance being analyzed

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

a. Гіперпродукція кортизолу

b. Гіперпродукція глюкагону

c. Гіперпродукція соматотропіну

**d. Аутоімунне ушкодження В-клітин**

e. Інсулінорезистентність жирової тканини

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

a. 10 times

b. 5 times

**c. 2--4 times**

d. 1.5 times

e. Temperature does not affect reaction rate

94. 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. Neutrophilic

**c. Eosinophilic**

d. Monocytic

e. Lymphocytic

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

a. Glibenclamide

b. Loratadine

c. Paracetamol

d. Fentanyl

**e. Diclofenac sodium**

96. Від якого показника залежить коагулююча здатність електроліту?

a. Ступеня дисперсності золю

b. Об'єму золю

c. Густини золю

**d. Заряду іона-коагулятора**

e. Концентрації електроліту

97. 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. Adjuvant

c. Immunoglobulin

d. Antitoxic serum

**e. Anatoxin**

98. 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. Aminocaproic acid

b. Fibrinogen

c. Neodicoumarin (ethyl biscoumacetate)

**d. Protamine sulfate**

e. Vicasol (Menadione)

99. Total protein in blood serum is one of metabolic indicators. What test is usually used in clinical

laboratories to determine this value?

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

100. 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. Disinfectants (chloramine)
- d. Autoclaving
- e. Bacteria-excluding filters**

101. 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. Indomethacin
- c. Nurofen (Ibuprofen)
- d. Analgin (Metamizole)
- e. Paracetamol**

102. The third analytical group of cations (acid-base classification) includes  $\text{Ca}^{2+}$ ,  $\text{Sr}^{2+}$ ,  $\text{Ba}^{2+}$ . What acid can function as a precipitator agent (group reagent) for these cations?

- a.  $\text{HClO}_4$
- b.  $\text{HNO}_3$
- c.  $\text{HCl}$
- d.  $\text{CH}_3\text{COOH}$
- e.  $\text{H}_2\text{SO}_4$**

103. В яких структурах рослинних клітин накопичується вторинний крохмаль?

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

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

- a. C**
- b. D
- c.  $\text{B}_2$
- d. A
- e.  $\text{B}_1$

105. A benzimidazole derivative, omeprazole, has been prescribed to a patient with a duodenal ulcer accompanied by an increased secretion of gastric juice. What is the mechanism of action of this drug?

- a. Stimulation of  $\text{H}^+$ ,  $\text{K}^+$ -ATPase
- b. Blockade of  $\text{M}_1$ -cholinergic receptors
- c. Irreversible blockade of  $\text{H}^+$ ,  $\text{K}^+$ -ATPase**
- d. Blockade of  $\text{H}_2$ -histamine receptors
- e. Stimulation of  $\text{H}_2$ -histamine receptors

106. 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. Oxytocin and vasopressin
- c. Catecholamines
- d. Tropic hormones
- e. Insulin and glucagon

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

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

109. Salts and esters of oxalic acid are called:

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

110. The researcher while conducting the qualitative analysis that involves sulfates precipitation of the third analytical group cations ( $\text{Ca}^{2+}$ ,  $\text{Sr}^{2+}$ ,  $\text{Ba}^{2+}$ ) has to reduce solubility of sulfates. What substance should he use for this purpose?

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

111. What drug inhibits cholesterol synthesis in the liver?

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

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

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

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

- a. Attenuated vaccines**
- b. Denatured vaccines
- c. Adjuvant vaccines

- d. Anatoxin vaccines
- e. Adsorbed vaccines

114. 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. *Centaurea cyanus*
- c. *Calendula officinalis***
- d. *Arctium lappa*
- e. *Echinacea purpurea*

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

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

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

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

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

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

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

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

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

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

120. 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. Nephrotic syndrome
- c. Uremia**
- d. Acute renal failure
- e. Tubulopathy



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

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

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

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

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

- a.  $[\text{Ag}(\text{NH}_3)_2]\text{OH}$**
- b.  $\text{NaOH}$
- c.  $\text{NaHCO}_3$
- d.  $\text{Br}_2 (\text{H}_2\text{O})$
- e.  $\text{H}_2\text{SO}_4$

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

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

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

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

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

- a. Etherification
- b. Saponification
- c. Neutralization
- d. Hydrolysis of sucrose**
- e. Combustion

131. 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. Loperamide**
- c. Augmentin (Co-amoxiclav)
- d. Dexamethasone
- e. Mannitol

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

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

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

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

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

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

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

- a. Round capitulum
- b. Umbel
- c. Spike

d. Corymb

**e. Flat capitulum**

136. 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. Bilirubin

**b. Uric acid**

c. Ketone bodies

d. Lactate

e. Urea

137. 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<sub>2</sub>

e. 10% solution of CaCl<sub>2</sub>

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

a. Inhibition of cytoplasmic \\ membrane synthesis

b. Disruption of DNA synthesis

c. Inhibition of DNA gyrase

**d. Inhibition of cell wall synthesis**

e. Inhibition of protein synthesis \\ in ribosomes

139. To determine the qualitative content of a drug, a sample of the analyte solution was processed with 2M solution of HCl. A white precipitate, soluble in aqueous ammonia solution, was formed. This analytical effect indicates the presence of the following cations:

a. Mercury(II) cations

**b. Silver(I) cations**

c. Lead(II) cations

d. Tin(II) cations

e. Mercury(I) cations

140. Який механізм передачі захворювання епідемічного висипного тифу?

a. Повітряно-крапельний

b. Парентеральний

c. Вертикальний

d. Фекально-оральний

**e. Трансмісивний**

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

**a. Roots with rhizomes**

b. Seeds

c. Grass

d. Leaves

e. Inflorescences

142. A student studies the digestive system of vertebrates. The organ that is being studied is primarily located in the right upper quadrant of the abdomen. It detoxifies various metabolites, produces hormones and digestive biochemicals, regulates glycogen storage, synthesizes proteins, and decomposes red blood cells. What organ is being studied by the student?

**a. Liver**

b. Pancreas

c. Heart

d. Lungs

e. Kidneys

143. A person came to a doctor with complaints of loss of sensitivity and pain along the peripheral nerves. Blood testing revealed elevated levels of pyruvic acid. What vitamin can cause such changes, if it is deficient in the body?

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

144. 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. Immunofluorescence
- c. Virological method
- d. Bacteriological method
- e. Immunoblotting**

145. Under conditions of prolonged intoxication, a significant decrease in the activity of aminoacyl-tRNA synthetases can be observed. What metabolic process is disrupted in this case?

- a. DNA repair
- b. Protein biosynthesis**
- c. RNA processing
- d. Genetic recombination
- e. DNA replication

146. 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. Microfungi
- c. Mycoplasma**
- d. Protozoa
- e. Viroids

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

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

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

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

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

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

150. 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. Cell-mediated
- e. Reactive

151. 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. Unisexual
- b. Monandrous
- c. Dioecious
- d. Monoecious**
- e. Polyecious

152. 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. Spores**
- c. Inclusions
- d. Cilia
- e. Capsule

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

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

154. 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. Al(III) ions
- b. Zn(II) ions
- c. As(III) ions
- d. Sn(IV) ions
- e. Cr(III) ions**

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

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

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

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

e. Hypoxic hypoxia

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

a. Diphenylcarbazone

**b. Phenolphthalein**

c. Murexide

d. Eriochrome black T

e. Diphenylamine

158. 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. Equisetophyta

d. Pinophyta

e. Polypodiophyta

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

a.  $K_4[Fe(CN)_6]$

**b. Tollens reagent**

c.  $Br_2$

d.  $FeCl_3$

e.  $NaOH$

160. 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. Nuclear energy

**c. Electrical energy**

d. Mechanical energy

e. Electromagnetic energy

161. Etiological factors of infectious diseases can be infectious agents with diverse ultrastructure. Which of the following groups does not have cellular structure, protein synthesis, enzymatic and energy systems?

a. Protozoa

b. Rickettsia

c. Bacteria

**d. Viruses**

e. Fungi

162. 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. Calcium channel blockade

c. Activation of central  $\alpha$ -adrenoceptors

**d. Angiotensin-receptor blockade**

e. Inhibition of phosphodiesterase

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

a. *Urtica dioica*

b. *Chelidonium majus*

c. *Ledum palustre*

d. *Arctostaphylos uva-ursi*

**e. *Sambucus nigra***

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

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

165. 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. Coacervation
- c. Colloid protection
- d. Thixotropy
- e. Coagulation

166. 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. Immune complex
- c. Anaphylactic
- d. Delayed-type hypersensitivity
- e. Autoallergic

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

- a. Анальгін (метамізол натрію)
- b. Діазепам
- c. Амітриптилін
- d. Кофеїн-бензоат натрію
- e. Аміназин (хлорпромазин)

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

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

169. Який пігмент утворюється в реакції окиснення гему?

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

170. 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

171. 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. Lymphocytosis
- b. Basophilic leukocytosis

c. Eosinophilic leukocytosis

**d. Neutrophilic leukocytosis**

e. Monocytosis

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

a. Benzene and methylbenzene

**b. Propanal and propanone**

c. Butane and isobutane

d. Hexane and cyclohexane

e. Pentene-1 and pentene-2

173. A 37-year-old man developed leg edema after prolonged fasting. What pathogenetic factor plays the leading role in the development of edema in this case?

a. Increased osmotic pressure of interstitial fluid

b. Decreased osmotic blood pressure

c. Decreased hydrostatic blood pressure

d. Increased oncotic pressure in the tissues

**e. Decreased oncotic blood pressure**

174. 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. Egg-yolk salt agar

d. Endo agar

e. Ploskirev agar

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

a. Vicasol (Menadione)

b. Insulin

**c. Salbutamol**

d. Bisacodyl

e. Oxytocin

176. Який препарат належить до групи блокаторів H<sub>2</sub> – гістамінових рецепторів?

a. Гастроцепін

b. Альмагель

**c. Фамотидин**

d. Омепразол

e. Алохол

177. 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. Acetyl-CoA**

b. Lactate

c. Malate

d. Glucose

e. Succinate

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

a.  $\text{CH}_3\text{CH}_2\text{OH} + \text{HCl}$

**b.  $\text{C}_2\text{H}_6 + \text{Cl}_2$**

c.  $\text{C}_6\text{H}_6 + \text{Cl}_2$

d.  $\text{CH}_3\text{-CH}_3 + \text{O}_2$

e.  $\text{CH}_2=\text{CH}_2 + \text{Cl}_2$

179. Який збудник викликає захворювання сифіліс?

a. Mycobacterium tuberculosis



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

180. 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. Adrenaline
- b. Thyroxine
- c. Cortisol
- d. Insulin
- e. Glucagon

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

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

182. 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. Fugacity
- d. Isotonic coefficient
- e. Activity

183. You are studying the silvery downy plant of Asteraceae family, which is rich with essential oils and bitters. Harvested are apical sprouts with panicle of small round flower heads. This plant is:

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

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

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

185. 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 have the ability to coagulate the plasma. The pure culture of which of the following bacteria is discovered?

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

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

- a. Transcription activation
- b. Replication activation

- c. Repair activation
- d. Protein synthesis increase
- e. Protein synthesis depression**

187. 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. Urea
- b.  $\text{NaOH}$
- c. Valeric acid**
- d. ---
- e. HCl

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

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

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

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

191. 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. *Escherichia coli*
- b. *Mycobacteria*
- c. *Salmonellae*
- d. *Vibrio cholerae***
- e. *Spirochetes*

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

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

193. 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. *Schisandra chinensis***
- b. *Sorbus aucuparia*

- c. *Viburnum opulus*
- d. *Malus domestica*
- e. *Citrus limon*

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

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

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

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

196. За яким механізмом відбувається приєднання  $\text{Br}_2$  до пропену?

- a. S\_R
- b. S\_N
- c. A\_N
- d. S\_E
- e. A\_E

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

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

198. What cation of the third analytical group can be precipitated using the group reagent  $\text{H}_2\text{SO}_4$  only in the presence of ethanol (binds water and concentrates the solution)?

- a.  $\text{Sr}^{2+}$
- b.  $\text{Ca}^{2+}$
- c.  $\text{Na}^{+}$
- d.  $\text{Ba}^{2+}$
- e.  $\text{K}^{+}$

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

- a. Higher fatty acids
- b. Cholesterol
- c. Glucose
- d. Glucuronic acid
- e. Pyruvate

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

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

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

a. Cyclohexene

b. Phenanthrene

c. Anthracene

d. Benzene

e. Naphthalene

202. In the process of creating vaccines, pathogens of infectious diseases are being attenuated. What is the essence of the attenuation process?

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

b. Discovering antigenic determinants of the main antigens of the pathogen

c. Reduction of immunogenicity of the pathogen

d. Artificial reduction of virulent properties of pathogens

e. Isolation of protective antigens from microbial cells

203. 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. Portal hypertension

b. Cholemia

c. Arterial hypotension

d. Suprahepatic jaundice

e. Acholia

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

a. Strong reducing agents

b. Unsaturated hydrocarbons

c. Weak reducing agents

d. Strong oxidizing agents

e. Saturated hydrocarbons

205. 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 chloride

b. Sodium hydroxide

c. Ammonia

d. Hydrochloric acid

e. Hot water

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

a. *Adonis vernalis*

b. *Allium cepa*

c. *Thymus serpyllum*

d. *Carum carvi*

e. *Chamomilla recutita*

207. 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. Circulatory

c. Hypoxic

d. Anemic

e. Hemic

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

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

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

210. 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. Desorption
- c. Cohesion
- d. Adsorption**
- e. Recuperation

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

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

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

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

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

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

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

215. Який основний метод лабораторної діагностики ВІЛ інфекції?

- a. Реакція коагулінації
- b. Реакція пасивної гемаглютинації

c. Імуноферментний аналіз

d. Радіоімунний аналіз

e. Імунофлуоресцентний

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

a. Number of pseudomonads in 1 liter of water

b. Number of Escherichia coli 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 staphylococci in 1 liter of water

217. 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.  $\text{CaO}(\text{solid}) + \text{CO}_2(\text{gas}) = \text{CaCO}_3(\text{solid})$

c.  $\text{NH}_4\text{-NO}_2(\text{solid}) = \text{N}_2(\text{gas}) + 2\text{H}_2\text{O}(\text{gas})$

d.  $2\text{H}_2\text{S}(\text{gas}) + 3\text{O}_2(\text{gas}) = 2\text{SO}_2(\text{gas}) + 2\text{H}_2\text{O}(\text{gas})$

e.  $\text{C}_2\text{H}_2(\text{gas}) + \text{H}_2(\text{gas}) = \text{C}_2\text{H}_4(\text{gas})$

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

a. Calcium chloride

b. Unithiol

c. Naloxone

d. Proserin

e. Atropine sulfate