

1. Single-use syringes produced at a medical equipment factory need to be sterilized. What sterilization method would be the most advisable for this type of medical equipment?

- a. Pasteurization
- b. Autoclaving
- c. Tyndallization

d. Radiation sterilization (gamma-radiation)

- e. Dry heat

2. A woman, who during the 5th-10th weeks of her pregnancy had been taking sodium valproate for treatment of her epilepsy, gave birth to a child with pathology of the vertebral column (split spine). What side effect of the drug caused such malformation?

- a. Embryotoxic
- b. Mutagenic
- c. Fetotoxic
- d. Sensitizing

e. Teratogenic

3. A patient has been diagnosed with ischemic heart disease with high cholesterol levels. What drug should be included into the patient's treatment regimen?

- a. Celecoxib

b. Atorvastatin

- c. Hydrochlorothiazide
- d. Diclofenac sodium
- e. Fentanyl

4. In a maternity hospital infants are vaccinated against tuberculosis on the 5-7 day. What vaccine is used specifically for prevention of tuberculosis?

- a. STI vaccine
- b. DPT vaccine

c. BCG vaccine

- d. EV vaccine
- e. TABTe vaccine

5. What factor of those named below is leading in developing symptom group characteristic of altitude sickness?

- a. Speed of ascent
- b. Solar radiation
- c. Heavy physical exertion

d. Decrease of oxygen partial pressure in air

- e. Daytime and nighttime temperature difference

6. In the qualitative analysis which involves precipitation of sulphates of the third analytical group cations ( $\text{Ca}^{2+}$ ,  $\text{Sr}^{2+}$ ,  $\text{Ba}^{2+}$ ) the solubility of sulphates can be reduced by adding:

a. Ethyl alcohol

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

7. In medicine, various dosage forms are used: emulsions, foams, powders, etc. that can be classified as disperse systems. What determines the dispersion in such systems?

- a. The mass of the comminuted substance
- b. The volume of the continuous medium
- c. The shape of the particles

d. The degree of the dispersed material comminution

- e. The nature of the dispersed material

8. Choose the most efficient way of convallariae glycoside administration for acute cardiac failure treatment:

- a. Inhalational
- b. Subcutaneous
- c. Oral
- d. Intramuscular
- e. Intravenous**

9. What reaction can be used to distinguish propyne from propene?

- a. Formation of acetylenides**
- b. Decoloration of bromine water solution
- c. Wurtz's reaction
- d. Polymerization
- e. Decoloration of  $\text{KMnO}_4$  solution

10. A man with *Trichomonas urethritis* was prescribed an imidazole derivative for treatment. Name this drug:

- a. Azithromycin
- b. Metronidazole**
- c. Nitroxoline
- d. Furacilin (Nitrofural)
- e. Ciprofloxacin

11. When studying a herbarium specimen of *Persicaria maculosa*, the following diagnostic sign, characteristic of all *Polygonaceae* family representatives, was noted:

- a. Legume fruits
- b. No petioles
- c. Compound leaves
- d. Essential oil glands
- e. Ochrea**

12. Pharmacopoeia reaction of potassium ferrocyanide with zinc cations produces:

- a. Yellow precipitate
- b. White precipitate**
- c. Red precipitate
- d. Black precipitate
- e. Violet precipitate

13. What indicator is used for the quantitative determination of sodium carbonate in a preparation by the method of acid-base titration?

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

14. Proserin is a reverse acetylcholinesterase inhibitor. What is the mechanism of inhibitory action of the drug?

- a. Enzyme denaturation
- b. Covalent bond outside of enzyme active center
- c. Oxidation of iron ion in enzyme active center
- d. Competition with acetylcholine for enzyme active center**
- e. Covalent bond with enzyme substrate

15. What compound can be classified as a condensed arene?

- a. Diphenylmethane
- b. Naphthalene**
- c. Biphenyl
- d. Benzene
- e. Triphenylmethane

16. A laboratory received ethanol and methanol. What reaction can be used to distinguish between these two substances?

- a. Formation of a chelate complex with copper hydroxide
- b. Beilstein test
- c. Oxidation ( $\text{CrO}_3$ ,  $\text{H}_2\text{SO}_4$ )
- d. Iodoform test ( $\text{I}_2 + \text{NaOH}$ )**
- e. Reaction with halogen anhydrides of inorganic acids

17. A patient was urgently brought to the infectious diseases hospital. The patient developed severe neurologic disorders 4 hours after he had eaten canned fish. A filtrate was prepared from the remains of this food product and given intraperitoneally to a guinea pig. 3 hours later the animal died. What disease can be suspected?

- a. Q fever
- b. Botulism**
- c. Typhoid fever
- d. Salmonellosis
- e. Brucellosis

18. What type of gynoecium has several or many free carpels?

- a. Apocarpous**
- b. Syncarpous
- c. Cenocarpous
- d. Paracarpous
- e. Monocarpous

19. What indicator is used in determination of primary aromatic amines using the nitritometric method?

- a. Eosin
- b. Phenolphthalein
- c. Methyl orange
- d. Tropaeolin 00**
- e. Potassium chromate

20. Gelatin expands the most in the following solvent:

- a. Diethyl ether
- b. Acetic acid solution
- c. Ethanol
- d. Benzene
- e. Water**

21. A patient has been provisionally diagnosed with diabetes mellitus. What erythrocyte protein needs to be measured in this case to assess the glycemia levels in the patient?

- a. C-reactive protein
- b. Bence-Jones protein
- c. gamma-globulin
- d. Glycated hemoglobin**
- e. alpha<sub>2</sub>-globulin

22. What coordinates are used to build monomolecular adsorption isotherms?

- a. Adsorption - concentration**
- b. Inverse adsorption - concentration
- c. Logarithm of adsorption - concentration
- d. Surface tension - concentration
- e. Inverse adsorption - inverse concentration

23. Gravimetric titration was used to determine aluminium mass fraction in a medicinal preparation. Ammonium hydroxide solution was used as a precipitant. In this case the gravimetric form will be:

- a. Ammonium nitrate
- b. Aluminium oxide**

- c. Aluminium carbonate
- d. Aluminium hydroxide
- e. Ammonium chloride

24. A 35-year-old woman came to a doctor with complaints of headache, insomnia, loss of appetite, abdominal pain, a fever of  $39\text{--}40^{\circ}\text{C}$ , and a rash that appeared on her abdomen. The woman was clinically diagnosed with typhoid fever. A sample of patient's blood serum was sent to a laboratory for serological testing with antibody detection. What serological test must be performed to confirm this diagnosis?

- a. Immunofluorescence assay
- b. Hemagglutination inhibition assay
- c. Wasserman complement fixation test
- d. Widal agglutination test**
- e. Ascoli precipitation test

25. What method of titrimetric analysis is used to quantify streptocide (sulfanilamide) with a  $\text{KBrO}_3$  solution in the presence of  $\text{KBr}$ ?

- a. Vanadatometry
- b. Permanganometry
- c. Dichromatometry
- d. Bromatometry**
- e. Iodometry

26. A patient with acute renal failure in the polyuria stage has azotemia that not only did not decrease, but continues to deteriorate. What caused polyuria in this case?

- a. Decreased reabsorption**
- b. Decreased filtration
- c. Increased secretion
- d. Increased reabsorption
- e. Increased filtration

27. A laboratory has conducted a soil study to identify the causative agents of an anaerobic infection. Spore-forming is a characteristic feature of these bacteria. What staining technique can be used to detect spores?

- a. Romanowsky-Giemsa stain
- b. Ozheshko stain**
- c. Morozov stain
- d. Neisser stain
- e. Burri-Gins stain

28. A patient with gastric carcinoma has undergone several courses of radiation therapy. What system is the first to become functionally disturbed after the body was exposed to ionizing radiation?

- a. Urinary
- b. Digestive
- c. Nervous
- d. Respiratory
- e. Blood**

29. To disinfect a burn surface, an antiseptic was used. When interacting with tissues, this antiseptic releases atomic oxygen and manganese dioxide. What antiseptic was used in this case?

- a. Hydrogen peroxide
- b. Potassium permanganate**
- c. Ethyl alcohol
- d. Iodine alcohol solution
- e. Brilliant green

30. A skin area turned red after an exposure to high temperature. What local circulatory disorder can be observed in the focus of the acute inflammation, resulting in the "rubor"?

- a. Venous hyperemia**

b. Ischemia

**c. Arterial hyperemia**

d. Thrombosis

e. Stasis

31. What indicator should be chosen for standardization of a hydrochloric acid solution using  $\text{Na}_2\text{CO}_3$  and  $\text{Na}_2\text{B}_4\text{O}_7$  solutions?

a. Thymol blue

b. Tropeolin 00

**c. Methyl red**

d. Eosin

e. Murexide

32. Insulin production in beta-cells involves many substances. What substance gives the main signal for insulin synthesis when its concentration changes?

**a. Glucose**

b. Hemoglobin

c. Carbon dioxide

d. Urea

e. Heparin

33. During a hypertensive crisis, magnesium sulfate was administered to the patient, resulting in a sharp decrease of blood pressure. What drug can be administered to eliminate the side effects of magnesium sulfate?

a. Trilon B (disodium EDTA)

b. Potassium chloride

**c. Calcium chloride**

d. Sodium sulfate

e. Sodium bromide

34. In the practice of harvesting herbal raw material of Asteraceae family the term "flowers" means both individual flowers and inflorescences. However, the notion of "flowers" is botanically correct only for:

a. *Echinops ritro*

**b. *Centaurea cyanus***

c. *Arnica montana*

d. *Bidens tripartita*

e. *Gnaphalium uliginosum*

35. The population is being vaccinated for specific disease prevention. What type of immunity is developed as the result of this vaccination?

**a. Artificially acquired active**

b. Naturally acquired active

c. -

d. Naturally acquired passive

e. Artificially acquired passive

36. L-DOPA and its derivatives are used in treatment of Parkinson's disease. What aminoacid is this substance made of?

a. Glutamate

b. Arginine

**c. Tyrosine**

d. Asparagine

e. Tryptophan

37. Cytology has detected sex chromatin (Barr bodies) in interphase cell nuclei of a 23-year-old man. What chromosomal disorder is it characteristic of?

a. Trisomy X

b. Cri-du-chat syndrome

c. Klinefelter syndrome

d. Turner syndrome

e. Down syndrome

38. What rule describes the coagulation of sols under the effect of electrolytes?

a. Gibbs rule

b. Van 't Hoff rule

c. Duclos-Traube rule

d. Schulze-Hardy rule

e. Arrhenius equation

39. Name the structural unit of a colloidal solution of a medicinal substance:

a. Zwitterion

b. Molecule

c. Micelle

d. Ion

e. Atom

40. A patient has marked allergic symptoms: rashes on the body, facial edema, itching. This condition is associated with an increase in formation of a certain biogenic amine. Name this biogenic amine.

a. Indican

b. Histamine

c. Putrescine

d. GABA

e. Cadaverine

41. Rapid growth of tumor node and its progressing malignant change (malignization) is observed in a patient. The described developments are characteristic of the following stage of tumor growth:

a. Exudation

b. Transformation

c. Promotion

d. Inactivation

e. Progression

42. In potentiometric titration the following indicator electrode is used for chloride and borate acids quantitative determination in their mixture:

a. Glass

b. Silver

c. Platinum

d. Calomel

e. Silver-chlorine

43. A patient undergoes chemotherapy with 5-fluorouracil that is a competitive inhibitor of thymidilate synthase. What process is inhibited by this drug?

a. Adenosine triphosphate synthesis

b. Purine nucleotides disintegration

c. Purine nucleotides salvage

d. Glucose synthesis

e. Thymidine monophosphate synthesis

44. Calcium carbonate crystals are deposited as clusters on the inner protrusions of a cell wall. What are these formations called?

a. Raphides

b. Styloids

c. Cystoliths

d. Druses

e. Druses attached to cell membrane

45. A certain infection leads to fetus malformation if a pregnant woman is affected. What vaccine

should be used for prevention of this infection?

- a. Poliovirus vaccine
- b. Rubella virus vaccine**
- c. Mumps vaccine
- d. Antirabic vaccine
- e. Influenza virus vaccine

46. Every year in autumn a coniferous tree from the Gymnospermae subdivision undergoes defoliation of its soft needles situated on short shoots. It is characteristic of the following genus:

- a. Picea
- b. Pinus
- c. Abies
- d. Cedrus
- e. Larix**

47. Nitrate anions, unlike nitrite anions, do not interact with:

- a. Sulfanilic acid
- b. Antipyrine
- c. Potassium permanganate**
- d. Diphenylamine
- e. Iron(II) sulfate and sulfuric acid

48. On examination the patient's sclera and oral mucosa are icteric. What biochemical blood value can be expected to be increased?

- a. Cholesterol
- b. Bilirubin**
- c. Glucose
- d. Albumin
- e. Amylase

49. Amino acids take part in methylation reactions during the synthesis of a number of bioactive substances - adrenaline, melatonin, phosphatidylcholine, creatine. For the synthesis of these compounds, the active form of a certain amino acid is used. Name this amino acid.

- a. Phenylalanine
- b. Valine
- c. Methionine**
- d. Threonine
- e. Alanine

50. What medium is necessary for determining the halide ions argentometrically using the Volhard method?

- a. Nitric acid medium**
- b. Strong alkaline medium
- c. Weak alkaline medium
- d. Acetic acid medium
- e. Neutral medium

51. When determining oxidizing agents by means of iodometry in the presence of starch the following phenomenon can be observed at the titration endpoint:

- a. White precipitate forms
- b. Green coloring of precipitate appears
- c. Red coloring appears
- d. Green coloring of solution disappears
- e. Blue coloring disappears**

52. A ready-made drug was inoculated on Sabouraud's agar and incubated under 22°C for 5 days. This nutrient medium was used to determine the following:

- a. Presence of *S. aureus*
- b. Presence of *E. coli*

c. Total number of bacteria

**d. Number of mold and yeast fungi**

e. Presence of Salmonella

53. Malignant tumors have a number of morphological and functional characteristics that differ them from benign ones. What is typical only of malignant tumors?

a. Only local influence

**b. Low degree of cell differentiation**

c. Expansive growth

d. No metastases

e. No recurrences

54. After examination the patient was diagnosed with tick-borne encephalitis. What route of transmission is characteristic of this disease?

a. Fecal-oral transmission

b. Parenteral transmission

c. Airborne droplet transmission

**d. Vector-borne transmission**

e. Vertical transmission

55. What diuretic reduces excretion of uric acid?

a. Acetazolamide

b. Furosemide

**c. Hydrochlorothiazide**

d. Mannitol

e. Verospiron (Spironolactone)

56. Examination of the patient's oral cavity detects the signs of aphthous stomatitis. Microscopy of the smears prepared from the contents of the aphthous ulcers shows gram-positive round and oval cells that vary in size and exhibit signs of budding pattern of cell division. What microorganisms are the likely cause of this pathology?

a. Pneumococci

**b. Candida fungi**

c. Meningococci

d. Streptococci

e. Staphylococci

57. Anticholinesterase agents have an effect on neuromuscular transmission and on the tone and motility of the gastrointestinal tract and urinary bladder. What drug is a synthetic representative of this group of drugs?

a. Physostigmine salicylate

b. Dipyroxime (Trimedoxime bromide)

c. Galantamine hydrobromide

**d. Prozerin (Neostigmine)**

e. Isonitrozone

58. Throughout the last year, a 2-year-old child had frequent infectious diseases of a bacterial genesis with a protracted course. Study of the patient's immunogram detected hypogammaglobulinemia. What cells are most likely to be dysfunctional in this case, causing these clinical presentation and laboratory findings?

a. Macrophages

b. Killer T cells

c. NK cells

d. Phagocytes

**e. B lymphocytes**

59. It can be safely assumed that the infants born from the mothers with the history of measles will not be affected by the measles outbreak during their stay in the maternity ward. What classes of antibodies provide the infants with the resistance to this disease?

- a. IgD
- b. IgA
- c. IgG**
- d. IgM
- e. IgE

60. The gradual aging of the body is accompanied by the slowing down of metabolic processes, the appearance of wrinkles, and the literal desiccation of a human body, associated with the cells in muscles and skin losing a certain ability that they have. Name this ability of the cells.

- a. Swelling**
- b. Wetting
- c. Cohesion
- d. Adhesion
- e. Moistening

61. A solution of an alkali was added into the analyte solution and the resulting solution was heated. In the process, a black precipitate formed and a pungent-smelling gas was released. It indicates the presence of the following in the solution:

- a. Ammonium and calcium ions
- b. Ammonium and mercury(II) ions
- c. Ammonium and mercury(I) ions**
- d. Ammonium and lead(II) ions
- e. Ammonium and stannum(II) ions

62. Herbarium specimens of medicinal plants are being studied. Which one of them belongs to Rosaceae family?

- a. *Conium maculatum*
- b. *Polygonum persicaria*
- c. *Capsella bursa-pastoris*
- d. *Melilotus officinalis*
- e. *Crataegus sanguinea***

63. What ion increases osmotic pressure in the focus of inflammation?

- a. Magnesium
- b. Potassium**
- c. Calcium
- d. Chlorine
- e. Fluorine

64. A chemist-analyst must determine the quantitative content of hydrochloric acid in a mixture that contains nitric acid. What titrimetric method of analysis can be used for this purpose?

- a. Acid-base titration
- b. Complexonometry
- c. Permanganatometry
- d. Argentometry**
- e. Iodometry

65. What substance forms colloid solution when dissolved in water?

- a. Potassium gluconate
- b. Collargol**
- c. Silver nitrate
- d. Sucrose
- e. Sodium sulfate

66. Cellulose hydrolysis produces the following disaccharide:

- a. Sucrose
- b. Cellobiose**
- c. Maltose
- d. Glucose

e. Lactose

67. A patient with essential hypertension is prescribed captopril. What is the mechanism of action of this drug?

- a. alpha-adrenoceptor block
- b. beta-adrenoceptor block
- c. Slow calcium channel block
- d. Inhibition of angiotensin-converting enzyme activity**
- e. Angiotensin II receptor block

68. Megaloblasts and a high color index were detected in the child's blood. The child was diagnosed with megaloblastic anemia. What drug must be prescribed in this case?

- a. Nicotinic acid
- b. Iron lactate
- c. Cyanocobalamin**
- d. Ascorbic acid
- e. Coamidum

69. A doctor prescribed diazepam to a patient with anxiety disorders. What pharmacological effect of the drug is the cause of such a prescription?

- a. Hypotensive
- b. Anticonvulsant
- c. Antianginal
- d. Anti-inflammatory
- e. Anxiolytic**

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

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

71. Which one of the substances listed below is not a surfactant?

- a. Sodium oleate
- b. 1-Pentanol
- c. Sodium stearate
- d. Sodium chloride**
- e. Sodium palmitate

72. A patient has toxic pulmonary edema. What drug must be used for emergency aid in this case?

- a. Indapamide
- b. Mannitol**
- c. Spironolactone
- d. Diacarb (Acetazolamide)
- e. Hydrochlorothiazide

73. A modern drug that inhibits the HMG-CoA reductase enzyme and reduces cholesterol synthesis was received by a pharmacy chain. Name this drug.

- a. Enalapril
- b. Hydrochlorothiazide
- c. Atorvastatin**
- d. Lisinopril
- e. Furosemide

74. Aggression enzymes are characteristic of pathogenic microorganisms. Select one such aggression enzyme from the list.

- a. Transferase
- b. Lactamase

- c. Lyase
- d. Catalase

**e. Lecithinase**

75. Prosenchyma cells with framed pores in their membranes were detected during microscopy of raw material fragment. Such cells are characteristic of the following tissues:

- a. Storage tissue
- b. Strengthening tissue
- c. Integumentary tissue
- d. Growth tissue

**e. Conducting tissue**

76. A fruit consists of overgrown conic red pulpy hypanthium and proper carpels - small nuciform achenes recessed in the fruit pulp. This type of fruit belongs to:

- a. *Rubus idaeus*
- b. *Pyrus communis*

**c. *Fragaria vesca***

- d. *Aronia melanocarpa*
- e. *Rosa canina*

77. Upon examination of a flower it is determined to have one pistil made up of single free carpel. Therefore, this gynoecium can be identified as:

- a. Paracarpous
- b. Syncarpous

**c. Monocarpous**

- d. Lysicarpous
- e. Apocarpous

78. Complexonometry is a titrimetric method of analysis based on the interaction of polydentate ligand complexes with cations of alkaline earth and heavy metals, which results in formation of strong, easily water-soluble compounds. Solution of what substance is used in complexonometry as a titrant?

**a. Trilon B (ethylenediaminetetraacetic acid tetrasodium salt)**

- b. Potassium dichromate
- c. Sodium thiosulfate
- d. Silver(I) nitrate
- e. Sulfuric acid

79. What is the mechanism of Br<sub>2</sub> attaching to propene?

- a. S<sub>R</sub>
- b. S<sub>N</sub>

**c. A<sub>E</sub>**

- d. A<sub>N</sub>
- e. S<sub>E</sub>

80. Potentiometry is an analytical method widely used in pharmaceutical analysis. In what galvanic cell its electromotive force (EMF) does not depend on the value of standard electrode potentials?

**a. Concentration galvanic cell**

- b. Galvanic cell without ionic transport
- c. Chemical galvanic cell
- d. Galvanic cell with ionic transport
- e. Reversible galvanic cell

81. Microcrystalloscopy reaction for detecting potassium ions is the following one:

**a. With sodium lead (II) hexanitrocuprate**

- b. With sodium tetraphenylborate
- c. With sodium hexanitrocobaltate
- d. With sodium hydrotartrate
- e. Flame colour test

82. A woman complains of elevated body temperature, weight loss, irritability, palpitations, and exophthalmos. Such changes are characteristic of the following endocrinopathy:

- a. Hyperthyroidism
- b. Hypercorticism
- c. Hypothyroidism
- d. Hyperaldosteronism
- e. Hypoaldosteronism

83. A case of hepatitis A was registered at a school. What drug should be used for specific prevention in the children, who were in a contact with the sick classmate?

- a. Inactivated vaccine
- b. Immunoglobulin
- c. Ribavirin
- d. Interferon
- e. Live vaccine

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

85. What bacteria indicate the presence of fecal contamination?

- a. Serratia
- b. Sarcina
- c. Klebsiella
- d. Escherichia coli
- e. Anthracoids

86. A man was brought into the admission room with complaints of problematic breathing, salivation, spastic abdominal pain, diarrhea, dizziness, and deteriorating visual acuity. He was diagnosed with a poisoning caused by organophosphorus compounds. What medicines should be included into the pathogenetic therapy in this case?

- a. Glucose and bemegride
- b. Sodium thiosulfate and bemegride
- c. Tetacin-calcium (sodium calcium edetate) and unithiol (dimercaptopropanesulfonate)
- d. Atropine sulfate and dipyrroxime (trimedoxime bromide)
- e. Nalorphine hydrochloride and bemegride

87. Against the background of treatment with antihypertensive drugs, a woman developed a dry cough. What drugs have caused this side effect?

- a. Ganglioblockers
- b. alpha-blockers
- c. Calcium channel blockers
- d. ACE inhibitors
- e. Diuretics

88. Long-term taking of sulfonamides has resulted in the patient developing anemia, leukopenia, and thrombocytopenia. What is the mechanism of development of these disorders?

- a. These disorders have not been caused by the medicines
- b. Inhibition of hematopoiesis in the bone marrow
- c. Destruction of blood elements
- d. Intensified use of blood elements
- e. Bone marrow stimulation

89. What group of diuretics completely rules out simultaneous prescription of hypotensive drugs that

are inhibitors of angiotensin converting enzyme?

- a. Loop
- b. Xanthine
- c. Osmotic
- d. Potassium-sparing**
- e. Thiazide

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

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

91. A person with a past history of acute myocardial infarction was recommended to take an antiaggregant that blocks platelet cyclooxygenase. What medicine can be classified as an antiaggregant?

- a. Abciximab
- b. Clopidogrel
- c. Ticlopidine
- d. Dipyridamole
- e. Acetylsalicylic acid**

92. Heparin is a direct-acting anticoagulant that decreases blood clotting and prevents formation of the thrombus. This substance activity is based on the phenomenon of:

- a. "Colloidal protection"**
- b. Syneresis
- c. Thixotropy
- d. Micelle formation
- e. Dialysis

93. Coagulation of hydrophobic sols occurs after a certain amount of electrolyte is added. How do we call the minimal concentration of electrolyte that induces colloid solution coagulation?

- a. Condensation
- b. Neutralization
- c. Coagulation ability
- d. Concentration
- e. Coagulation threshold**

94. The following is used to determine the titrant volume in the process of titrimetric analysis:

- a. Measuring glasses
- b. Measuring flasks
- c. Burettes**
- d. Measuring tubes
- e. Cylinders

95. IgM to rubella virus were detected in the blood serum of a sick child. What stage of the disease progression is indicated by this sign?

- a. Incubation
- b. Chronic
- c. Persistent
- d. Acute**
- e. Post-vaccination

96. In the process of conductometric titration of HCl and CH<sub>3</sub>COOH acids mixture 0,1 M solution of NaOH is used to measure:

- a. Potential difference
- b. Rotation angle of polarized light plane
- c. Electrical conduction in solution**

- d. Refractive index
- e. pH of medium

97. A fruit tree of Rosaceae family has short thorny shoots; the fruit is a distinctively-shaped pome with stone cells in its pulp. Name this plant:

- a. *Prunus spinosa*
- b. *Pyrus communis***
- c. *Cerasus vulgaris*
- d. *Prunus armeniaca*
- e. *Malus sylvestris*

98. Jellies and the process of jellyfication are of great importance in medicine and biology. Name the process of jelly destruction followed by the restoration of its jellified state:

- a. Coacervation
- b. Syneresis
- c. Thixotropy**
- d. Salting-out
- e. Coagulation

99. Fatty degeneration of liver is prevented by lipotropic substances. Which of the following substances belongs to them?

- a. Methionine**
- b. Glucose
- c. Glycine
- d. Cholesterol
- e. Bilirubin

100. The following belongs to high-concentration suspensions:

- a. Foams
- b. Pastes**
- c. Ointments
- d. Powders
- e. Creams

101. A child that attends a day care center fell ill with measles. What is used to prevent this disease in the contact persons?

- a. Measles vaccine
- b. Antibiotics
- c. Measles immunoglobulin**
- d. Immunostimulants
- e. Sulfanilamides

102. A unilocular, single-seeded fruit has a pericarp with an exocarp, a juicy mesocarp, and a lignified endocarp. What plant is it characteristic of?

- a. *Coriandrum sativum*
- b. *Armeniaca vulgaris***
- c. *Quercus robur*
- d. *Leonurus quinquelobatus*
- e. *Potentilla erecta*

103. A 40-year-old man with allergic rhinitis has come to the dispensing chemist. He wants to substitute dimedrol (diphenhydramine), that he currently takes, with another antihistamine because dimedrol makes him drowsy and unable to concentrate. What drug would the dispensing chemist recommend?

- a. Aevit (Vitamins A and E)
- b. Loratadine**
- c. Analgin (Metamizole)
- d. Retabolil (Nandrolone)
- e. Laferon (Interferon alfa-2b)

104. Calculation of thermal effects of chemical reactions at a pharmaceutical factory is based on the Hess law stating that reaction thermal effect is determined by:

- a. Number of intermediate stages
- b. Route by which the chemical change occurs
- c. Mechanism by which the chemical change occurs
- d. Process duration

**e. Initial and final state of system**

105. What indicator is used in the Fajans-Khodakov method to determine sodium iodide (NaI)?

- a. Ammonium iron(III) sulfate
- b. Potassium chromate

**c. Eosin**

- d. Diphenylcarbazone
- e. Methyl orange

106. The breakdown of hemoglobin is accompanied by the formation of bile pigments. What pigment forms as a result of the heme oxidation reaction?

- a. Stercobilinogen
- b. Carotene

**c. Biliverdin**

- d. Urobilinogen
- e. Chlorophyll

107. Name the pharmacopoeial method for determining the relative molecular mass of high-molecular compounds:

- a. Osmometry
- b. Cryoscopy

**c. Viscosimetry**

- d. Ebullioscopy
- e. Calorimetry

108. Cholesterol synthesis inhibitors are used as antiatherosclerotic drugs. Select one such drug from the list:

- a. Pancreatin
- b. Sulfanilamide

**c. Lovastatin**

- d. Benzylpenicillin
- e. Chloramphenicol

109. A person with carbon monoxide poisoning (CO) presents with disturbed consciousness and high levels of carboxyhemoglobin in blood. What type of hypoxia does this patient have?

- a. Respiratory
- b. Tissue
- c. Circulatory

**d. Hemic**

- e. Exogenic

110. What analytical effect is observed when a solution that contains acetate ions is heated with ethyl alcohol and concentrated sulfuric acid?

- a. Formation of a yellow precipitate
- b. Formation of a white precipitate
- c. Formation of a blue precipitate

**d. Release of a characteristic odor**

- e. Formation of a black precipitate

111. Ammonium thiocyanate solution was added into the solution being studied. The resulting solution colored red. This analytical effect indicates the presence of the following cation:

**a. Iron(III)**

- b. Mercury(I)

- c. Mercury(II)
- d. Lead(II)
- e. Silver

112. A patient has periodic urticaria that manifests as blisters that the patient develops on the skin after eating red fish. The patient has been diagnosed with anaphylactic allergic reaction. In this case, an increase in the titer of a certain immunoglobulin would be detected. Name this immunoglobulin.

- a. IgD
- b. IgG
- c. IgE
- d. IgA
- e. IgM

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

- a. Conductometry
- b. Potentiometry
- c. Colorimetry
- d. Calorimetry

e. Steam distillation

114. Name the reactions and reagents that under certain conditions allow determination of certain ions in the presence of other ions:

- a. General
- b. Group
- c. Characteristic
- d. Selective

e. Specific

115. Explain to a pharmacy student, why group III anions have no group reagent:

- a. They have large ionic radii
- b. They can form soluble acids
- c. They have close ionic radii
- d. They belong to toxic elements

e. They form water-soluble salts with most cations

116. A bulbous plant with specific odor has basal leaf arrangement; the leaves are cylindrical and fistulose. Its peduncle bears a simple umbel inflorescence with membranous indusium. Its fruit is a capsule. These features of the plant indicate that it belongs to the following species:

- a. Acorus calamus
- b. Agropyron repens
- c. Allium sativum

d. Allium cepa

e. Convallaria majalis

117. A solution contains anions of organic acids. When a solution of iron(III) chloride was added, a pink-yellow precipitate formed. What anions are present in the solution?

a. Benzoate anions

- b. Carbonate anions
- c. Formate anions
- d. Tetraborate anions
- e. Oxalate anions

118. Adrenaline is used to prolong the action of novocaine (procaine) during infiltration anesthesia. What effect of adrenaline provides this prolongation?

- a. Vasodilation
- b. Functional suppression of nerve endings and conductors
- c. Potentiation of novocaine (procaine) action at the level of central nervous system
- d. Vasoconstriction

e. Inhibition of tissue esterases

119. The process of one substance drawing the other in only with its surface is called:

- a. Chemisorption
- b. Coagulation
- c. Absorption
- d. Desorption

e. Adsorption

120. A food plant of Polygonaceae family is being studied. The plant has reddish stalk, cordate-sagittate leaves, its fruit is a trihedral nutlet. Name this plant:

- a. Persicaria bistorta
- b. Persicaria hydropiper
- c. Rumex confertus
- d. Fagopyrum esculentum
- e. Polygonum aviculare

121. The isoelectric point of a protein is 5.7. At what pH value does the protein macroion move to the anode?

- a. 5.0
- b. 4.0
- c. 5.7
- d. 4.7

e. 7.0

122. The pharmacological effect of some antidepressants is associated with detoxification of biogenic amines in the brain. What enzyme inactivates biogenic amines?

- a. Decarboxylase
- b. Transaminase
- c. Monoamine oxidase
- d. Deaminase
- e. Lactate dehydrogenase

123. Some hormones are synthesized from amino acids in the body. What amino acid is the precursor to the thyroxine hormone?

- a. Cysteine
- b. Tyrosine
- c. Histidine
- d. Glutamine
- e. Arginine

124. What conditions are necessary for the formation of crystalline precipitates?

- a. Slow precipitation in cold dilute solutions
- b. Slow precipitation in hot dilute solutions
- c. Slow precipitation in cold concentrated solutions
- d. Rapid precipitation in hot dilute solutions
- e. Rapid precipitation in hot concentrated solutions

125. A 5-year-old child after drinking milk often develops the following symptoms: abdominal distension, spastic pain and diarrhea. These symptoms develop after 1-4 hours after single instance of taking milk. What enzymes are deficient, thus, causing the described symptomatology?

- a. Lactolytic
- b. Fructolytic
- c. Sucrolytic
- d. Glucolytic
- e. Maltolytic

126. Tests for agglutination and lysis of the Leptospira bacteria are used in microbiological diagnostics of leptospirosis. How should these tests be evaluated?

- a. Against dark background
- b. With microscope set at low magnification
- c. With unaided eye
- d. With dark field method**
- e. With agglutinoscope

127. The defensive mechanisms against some infectious diseases can be greatly reinforced with interferon. Interferon preparations will be the most advisable in cases of the following type of infections:

- a. Helminthic
- b. Fungal
- c. Viral**
- d. Microbioses
- e. Protozoal

128. Enteral lipid metabolism is possible only under a certain set of conditions. What substance of those named below provides for emulsification of lipids, activation of lipase and absorption of fatty acids?

- a. Cholesterol
- b. Amino acids
- c. Glucose
- d. Hydrochloric acid
- e. Bile acid**

129. Dysbiosis can be treated with drugs that contain living representatives of normal microflora as well as their metabolic products. Select the microorganisms that are used for the production of such drugs:

- a. Yersinia
- b. Bifidus bacteria**
- c. Proteus
- d. Staphylococcus aureus
- e. Providencia

130. What forms when gelatin dissolves in water at an elevated temperature?

- a. Brittle xerogel
- b. Elastic xerogel
- c. Emulsion
- d. Molecular solution**
- e. Suspension

131. A 48-year-old patient has been intravenously administered prednisolone solution to arrest severe attack of bronchial asthma. What group of hormonal agents does prednisolone belong to?

- a. Gestagenic drugs
- b. Glucocorticoids**
- c. Mineralocorticoid
- d. Anabolic steroids
- e. Estrogenic drugs

132. For a humoral immune response to form, a number of cells of the immune system must interact with the antigen. What cells are the first to encounter the antigen?

- a. NK cells
- b. Suppressor T cells
- c. Macrophages**
- d. Helper T cells
- e. B lymphocytes

133. A patient with symptoms of cardiac glycosides intoxication is prescribed Unithiol (Dimercaprol). What is the drug's mechanism of action?

- a. Binding ionized  $\text{Ca}^{2+}$

**b. Reactivation of membrane  $K^+$ ,  $Na^+$ -adenosinetriphosphatase**

- c. Increase of  $K^+$  penetration of myocardiocytes
- d. Increase of  $Na^+$  content in myocardium
- e. Induction of cardiac glycosides metabolism

134. Bromatometric determination of streptocide (Sulfanilamide) is performed by means of direct titration with a standard solution of potassium bromate. What is used as an indicator in this method of titration?

- a. Phenolphthalein
- b. Murexide
- c. Iron(III) thiocyanate
- d. Eriochrome black T

**e. Methyl orange**

135. During morphological description of common periwinkle it was defined that it has shoot that trails on the ground and takes root. It allows to characterize such shoot as:

- a. Scandent
- b. Twining
- c. Recumbent
- d. Tenent

**e. Creeping**

136. To isolate a pure culture of the disease's pathogen, its specific biological properties were used: growth at low temperatures, type of respiration, pathogenicity for laboratory animals, growth on selective nutrient media, and the ability for "creeping growth" on the surface of the medium. What microbial culture is expected to be isolated in this case?

**a. Proteus vulgaris**

- b. Yersinia pestis
- c. Staphylococcus aureus
- d. Enterococcus faecalis
- e. Pseudomonas aeruginosa

137. What parameter determines the coagulating power of an electrolyte?

**a. Charge of the coagulator ion**

- b. Sol dispersion degree
- c. Electrolyte concentration
- d. Sol density
- e. Sol volume

138. When do order and molecularity of chemical reactions coincide?

- a. Never coincide
- b. In complex multi-stage reactions only
- c. In enzymatic reactions
- d. In simple one-stage reactions only**
- e. Always coincide

139. Ultraviolet irradiation is used in medicine in various physiotherapeutic procedures. What mechanism of medicinal action is characteristic of ultraviolet rays?

- a. Activation of drug action
- b. Intensification of cell division
- c. Decrease of melanin synthesis in the skin
- d. Activation of vitamin D synthesis**
- e. Activation of lipid peroxidation

140. A patient has developed anuria. Blood pressure is 50/20 mm Hg. What process of uropoiesis was disturbed resulting in acute decrease of urine output?

- a. Obligate reabsorption
- b. Tubular secretion
- c. Glomerular filtration**

- d. -
- e. Facultative reabsorption

141. Staphylococci grow well on common nutrient media. However, when isolating pure cultures from patients, blood agar and yolk-salt agar are used for inoculation. What is the purpose of using these nutrient media?

- a. To study the antigenic properties
- b. To determine the tinctorial properties
- c. To determine the mobility of the bacteria
- d. To measure the sensitivity to antibiotics
- e. To determine the pathogenicity factors**

142. A laboratory has received a sample of copper(II) sulfate pentahydrate. Choose the method for quantification of copper(II) in copper sulfate.

- a. Iodometry**
- b. Permanganatometry
- c. Argentometry
- d. Alkalimetry
- e. Acidimetry

143. A patient was prescribed doxycycline hydrochloride for etiopathogenetic treatment of an infectious process. In this case the patient should be warned about the following side effect:

- a. Photosensitization**
- b. Uricosuria
- c. Arterial hypertension
- d. Hypercapnia
- e. Peripheral edemas

144. Hydrochloric acid was added into the solution under investigation. The resulting precipitate was filtered, then this filter cake was processed with hot water; after the filtrate cooled, KI solution was added into it. What cation was present in the solution, if the precipitate was colored yellow?

- a.  $\text{Ag}^+$
- b.  $\text{Pb}^{2+}$**
- c.  $\text{Ba}^{2+}$
- d.  $\text{Ca}^{2+}$
- e.  $\text{Hg}^{2+}$

145. Plant fatty acids have an odd number of carbon atoms. What product forms as a result of beta-oxidation of fatty acids with an odd number of carbon atoms?

- a. Oxymethylglutaryl-CoA
- b. Acetoacetyl-CoA
- c. Palmitoyl-CoA
- d. Propionyl-CoA**
- e. Stearoyl-CoA

146. To treat glaucoma a doctor made a decision to prescribe a cholinomimetic agent of direct action. Name this drug:

- a. Atropine sulfate
- b. Platyphylline hydrotartrate
- c. Pilocarpine hydrochloride**
- d. Sulfacyl-sodium (Sulfacetamide)
- e. Zinc sulfate

147. A pharmaceutical factory has received a batch of a herbal raw material that, based on the external signs, was affected by a viral disease. What modern method of diagnostics should be used for the specific detection of viral nucleic acids in plants?

- a. Enzyme-linked immunosorbent assay
- b. Molecular hybridization**
- c. Hemagglutination reaction

- d. Indirect hemagglutination reaction
- e. Hemagglutination inhibition reaction

148. Photometry is one of the most common instrumental methods of analysis. It is based on the measurement of:

- a. Optical density
- b. Wavelength
- c. Rotation angle
- d. Refractive index
- e. Fluorescence intensity

149. What is the mechanism of action of the antiviral drug acyclovir?

- a. Inhibition of nucleic acid synthesis
- b. Inhibition of protein synthesis
- c. Increase of cellular membrane permeability
- d. Blockade of cellular wall synthesis
- e. Antagonism with para-aminobenzoic acid

150. One of the cations of the 1st group hinders detection of the others. Therefore, it should be detected first and then extracted. Name this cation:

- a.  $\text{NH}^{4+}$
- b.  $\text{K}^{+}$
- c.  $\text{Li}^{+}$
- d.  $\text{Na}^{+}$
- e.  $\text{Ca}^{2+}$

151. 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. Thermophilic
- c. Spore-formers
- d. Acid-fast
- e. Anaerobic

152. Name the type of an inflorescence that has an elongated and thickened main axis with sessile flowers:

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

153. Rhizome and roots of *Inula helenium* have cavities without clear inner margins that are filled with essential oils. What are they?

- a. Schizogenous cavities
- b. Resin ducts
- c. Non-articulated laticifers
- d. Lysigenous cavities
- e. Articulated laticifers

154. A woman underwent a gastroduodeno-scopy that revealed decreased functioning of the gastroesophageal junction with reflux of gastric contents into the esophagus. What sign is the main indicator of this disorder?

- a. Diarrhea
- b. Nausea
- c. Heartburn
- d. Palpitations
- e. Problematic swallowing

155. Integumentary tissue of roots consists of cells with thin cellulose membranes and protuberances - root hairs. This tissue is:

- a. Periderm
- b. Plerome
- c. Periblem
- d. Phelloderm

e. Epiblema

156. The anti-tumor preparation Methotrexate is a structural analogue of folic acid. The mechanism of its action is based on the inhibition of the following enzyme:

- a. Creatine kinase
- b. Xanthine oxidase

c. Dihydrofolate reductase

- d. Lactate dehydrogenase
- e. Hexokinase

157. To determine a certain second group cation, the <<golden rain>> reaction is used with slow cooling of the preheated reagents. What reaction product is formed during the slow precipitation?

- a.  $\text{Hg}_2\text{I}_2$
- b.  $\text{PbCl}_2$
- c.  $\text{HgI}_2$
- d.  $\text{AgI}$

e.  $\text{PbI}_2$

158. A female patient was prescribed loratadine to treat her allergic dermatitis caused by bee sting. What is the mechanism of the drug's antiallergic action?

- a. Decrease of leukotriene release
- b. Block of leukotriene D4 receptors
- c. Antiserotonin activity
- d. Inhibition of histamine H2 receptors

e. Inhibition of histamine H1 receptors

159. At an altitude of 20000 meters, a depressurization of a cargo plane occurred, followed by its crashing to the ground. A forensic examination determined that the people onboard had died before the impact with the ground. Embolism was stated as one of the causes of death of the entire crew. What type of embolism is most likely in this case?

- a. Air embolism
- b. Thromboembolism

c. Gas embolism

- d. Fat embolism
- e. Foreign body embolism

160. An iodine solution was prepared using the method of established titer. What primary standards can be used for the standardization in this case?

a. Hydrazine sulfate and arsenic(III) oxide

- b. Metallic iron and iron(II) sulfate
- c. Potassium dichromate and potassium bromate
- d. Ammonium oxalate and oxalic acid
- e. Sodium tetraborate and sodium carbonate

161. Cerebrospinal fluid of a patient diagnosed with meningitis was taken for analysis. To detect the causative agent the sample was inoculated in a nutrient medium. Prior to that a serum had been added to the medium. What causative agent is expected to be obtained in this case?

a. Rickettsia

b. Meningococcus

- c. Mycobacteria
- d. Staphylococcus
- e. Viruses

162. Select from the list a compound that is a pyridinecarboxylic acid:

- a. Malic acid
- b. Nicotinic acid**
- c. Uric acid
- d. Benzoic acid
- e. Barbituric acid

163. Metallochromic indicators are used in complexometric titration, when determining total water hardness. For this purpose, the following can be used as an indicator:

- a. Fluorescein
- b. Potassium chromate
- c. Methyl red
- d. Phenolphthalein
- e. Eriochrome black T**

164. Bacterioscopy of the smears prepared from urethral discharge detects there gram-positive intracellular diplococci. What microorganisms were detected in the material?

- a. Peptostreptococci
- b. Meningococci
- c. Staphylococci
- d. Gonococci**
- e. Streptococci

165. Production of injection solutions in pharmacies requires strict control of sterilization quality. What is placed in autoclave sterilization box to ensure proper control?

- a. Ampoule with viruses
- b. Ampoule with colibacillus culture
- c. Ampoule with fungi spores
- d. Ampoule with microbe spores**
- e. Ampoule with staphylococcus culture

166. What working solutions (titrants) are used in the method of precipitation titration - Volhard method?

- a. AgNO<sub>3</sub> and NH<sub>4</sub>SCN**
- b. H<sub>2</sub>SO<sub>4</sub> and NaOH
- c. KMnO<sub>4</sub> and KBrO<sub>3</sub>
- d. Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> and K(I<sub>3</sub>)
- e. HClO<sub>4</sub> and KOH

167. Name the process when a dissolved macromolecular compound is sedimented by adding electrolytes into the solution:

- a. Flocculation
- b. Salting out**
- c. Denaturation
- d. Coacervation
- e. Jelly formation

168. Foam aerosols are used for burn treatment. What type of dispersed systems are foams?

- a. Solid-solid
- b. Liquid-solid
- c. Solid-liquid
- d. Gas-liquid**
- e. Liquid-liquid

169. Etiological factors of infectious diseases can be infectious agents with diverse ultrastructure. Which of the following groups does textbfNOT have cellular structure, protein synthesis, enzymatic and energy systems?

- a. Rickettsia
- b. Viruses**

- c. Protozoa
- d. Bacteria
- e. Fungi

170. What reagent can be used to distinguish between ethanol ( $C_2H_5OH$ ) and glycerine?

- a.  $Ag_2O$
- b.  $KMnO_4$
- c.  $HBr$
- d.  $Cu(OH)_2$
- e.  $FeCl_3$

171. A gastric tea contains small oval brown lignified cone-shaped plant parts up to 1.5 cm in length that can be identified as:

- a. Larch cones
- b. Aggregate fruits of alnus
- c. Cypress cones
- d. *Platycladus orientalis* cones
- e. Berry-like juniper cones

172. A potassium chromate solution was added into the solution being analyzed, which resulted in the formation of a yellow precipitate, soluble in acetic acid. What cations were present in the solution, as indicated by this qualitative reaction?

- a. Magnesium cations
- b. Strontium cations
- c. Ammonium cations
- d. Potassium cations
- e. Sodium cations

173. A colloidal system can be purified using filtration under excess pressure through a semipermeable membrane. Name this purification method.

- a. Electrodialysis
- b. Filtration
- c. Diffusion
- d. Ultrafiltration
- e. Dialysis

174. Production of digestive juices by gastrointestinal tract mucosa is regulated by various factors. What local hormone can affect this process?

- a. Gastrin
- b. Calcitriol
- c. Angiotensin
- d. Bradykinin
- e. Endorphin

175. After a casual sexual contact, a 30-year-old man visited a hospital complaining of a painless ulcer with smooth edges on the head of his penis. What pathogen has caused the patient's disease in this case?

- a. *Mycoplasma*
- b. *Treponema*
- c. *Neisseria*
- d. *Ureaplasma*
- e. *Chlamydia*

176. A patient has been hospitalized with signs of ascites. The doctor prescribed the patient spironolactone to enhance the diuretic effect of hydrochlorothiazide. What effect does this drug have apart from the diuretic effect?

- a. Analgesic
- b. Sedative
- c. Irritant

d. Antispasmodic

**e. Potassium-sparing**

177. Quite often the soil may contain a number of pathogenic microorganisms. Causative agents of the following disease may exist in the soil for a long time:

a. Dysentery

b. Viral hepatitis

c. Pertussis

**d. Anthrax**

e. Diphtheria

178. A laboratory received a food product that had been taken from the focus of food poisoning and presumably contained botulinum toxin. To identify the type of toxin, the neutralization reaction must be performed on white mice. What biological product is used in this reaction?

a. Allergen

b. Diagnosticum

c. Antibacterial serum

**d. Antitoxic serum**

e. Normal serum

179. In nitritometry, titrant is a 0.1 M solution of sodium nitrite that is prepared as a secondary standard solution. What acid is used to determine the exact concentration of sodium nitrite?

a. Sulfuric

b. Acetic

**c. Sulfanilic**

d. Hydrochloric

e. Oxalic

180. A 45-year-old patient with rheumatoid arthritis was prescribed a glucocorticoid. Name this drug:

a. Mefenamic acid

**b. Prednisolone**

c. Analgin (Metamizole)

d. Insulin

e. Ibuprofen

181. How many atoms does a furanose cycle consist of?

**a. 5**

b. 6

c. 3

d. 7

e. 4

182. What thermodynamic potential is the criterion for the direction of a spontaneous process at constant volume and temperature?

a. Entropy

b. Gibbs energy

c. Chemical potential

**d. Helmholtz energy**

e. Enthalpy

183. Biological fluids (sera, enzyme and vitamin solutions, etc.) are vulnerable to high temperatures, which is why they are sterilized under the temperature of 56--58°C. They are heated 5--6 times, with 24-hour-long intervals between them. What sterilization method is it?

**a. Tyndallization**

b. Flaming

c. Moist heat sterilization

d. Pasteurization

e. Autoclaving

184. According to Hueckel's rule an organic compound will have aromatic properties if:

- a. There is a cyclohexane ring in the molecule
- b. Its molecular structure contains a planar cycle with a closed conjugated system that contains  $(4n+2)$  of pi electrons, where  $n = 0,1,2,3$ , etc.**
- c. Its molecules are composed exclusively of carbon and hydrogen atoms that form a linear carbon chain
- d. There is only one substituent in the molecule
- e. There are condensed nuclei in the molecule

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

- a. Copper(II) nitrate
- b. Sulfuric acid
- c. Hydrochloric acid
- d. Iron(II) sulfate
- e. Silver nitrate**

186. What titrimetric method of analysis is used for the quantification of calcium chloride?

- a. Cerimetry, direct titration
- b. Acidimetry, back titration
- c. Permanganatometry, direct titration
- d. Permanganatometry, back titration**
- e. Nitritometry, direct titration

187. Which of the given reactions produces ethane as a result?

- a.  $[Al_4C_3 \rightarrow H_2O]$
- b.  $[CH_2=CH_2 \rightarrow t^o, p]H_2, \kappa T.$**
- c.  $[C_2H_5OH \rightarrow k.H_2SO_4, t^o]$
- d.  $[CO + 2H_2 \rightarrow Fe, t^o]$
- e. -

188. What type of tautomerism is characteristic of monosaccharide?

- a. Oxo-cyclo (ring-chain)**
- b. Aci-nitro
- c. Keto-enol
- d. Lactam-lactim
- e. Azole

189. The mother of a 3-year-old child was taking antibiotics during her pregnancy. The child presents with destruction of the incisors and a brown border on the gums. What antibiotic has caused this side effect?

- a. Ciprofloxacin
- b. Levomycetin (Chloramphenicol)
- c. Azithromycin
- d. Co-amoxiclav
- e. Doxycycline hydrochloride**

190. Microscopy of the patient's vaginal smear detected trichomonads. What antimicrobial drug must be prescribed for treatment in this case?

- a. Metronidazole**
- b. Fluconazole
- c. Biseptol (Co-trimoxazole)
- d. Ethambutol
- e. Clotrimazole

191. Pharmacological action of enterosgel (methylsilicic acid hydrogel, polymethylsiloxane polyhydrate) is based on a certain phenomenon characteristic of disperse systems. Name this phenomenon:

- a. Desorption

- b. Adhesion
- c. Adsorption**
- d. Cohesion
- e. Wettability

192. Disintegration of adenosine nucleotides results in release of ammonia. What enzyme plays the key role in ammonia synthesis from these compounds?

- a. Amylase
- b. Alcohol dehydrogenase
- c. Lactate dehydrogenase
- d. Alanine transaminase
- e. Adenosine deaminase**

193. A patient developed neuritis of the facial nerve after 5 months of anti-tuberculosis treatment. What drug has caused this side effect?

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

194. What cations of the fifth analytical group (acid-base classification) form colored hydroxides when precipitated with a group reagent?

- a.  $\text{Ag}^+$ ,  $\text{Al}^{3+}$
- b.  $\text{Sn}^{2+}$ ,  $\text{Sr}^{2+}$
- c.  $\text{Na}^+$ ,  $\text{K}^+$
- d.  $\text{Fe}^{2+}$ ,  $\text{Fe}^{3+}$**
- e.  $\text{Ca}^{2+}$ ,  $\text{Ba}^{2+}$

195. What method of microspecimen staining is used to detect Mycobacterium tuberculosis?

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

196. Iodimetry involves use of standard solutions of iodine and  $\text{Na}_2\text{S}_2\text{O}_3$ . What substance is used to standardize the sodium thiosulfate solution?

- a.  $\text{K}_2\text{CO}_3$
- b.  $\text{As}_2\text{O}_3$
- c.  $\text{K}_2\text{Cr}_2\text{O}_7$**
- d.  $\text{N}_2\text{B}_4\text{O}_7$
- e. NaCl

197. Choose the colloid surfactant out of the substances listed below:

- a. Potassium oleate**
- b. Iodine
- c. Gelatin
- d. Polyethylene
- e. Sodium chloride

198. During feces analysis of a 3-month-old child with signs of enteric infection, numerous dark-red colonies have grown on Endo agar. What microorganisms can be the causative agents of this enteric infection?

- a. Escherichia**
- b. Streptococci
- c. Gonococci
- d. Salmonellae
- e. Shigella

199. After examination, the patient was diagnosed with alkaptonuria. What enzyme is deficient in this case, causing this pathology?

- a. Homogentisic acid oxidase
- b. Monoamine oxidase
- c. Tyrosinase
- d. Phenylalanine hydroxylase
- e. Thyroxine hydroxylase

200. On the 2nd day after developing acute inflammation of the knee joint, the patient exhibits the joint enlargement, swelling of the skin. At what stage of inflammation are these signs typically observed?

- a. Sclerosis
- b. Regeneration
- c. Alteration
- d. Exudation
- e. Proliferation

201. What fruits are apocarpous?

- a. Apple, acorn
- b. Aggregate drupe, follicetum
- c. Bean, single nutlet
- d. Capsule, berry
- e. Cremocarp, disk-shaped schizocarp

202. Molecular absorption analysis is based on the Beer-Lambert-Bouguer law. According to this law, optical density of a solution is:

- a. Directly proportional to the concentration and inversely proportional to the layer thickness
- b. Inversely proportional to the layer thickness and concentration of the substance
- c. Directly proportional to the layer thickness and concentration of the substance
- d. Directly proportional to the layer thickness and monochromatic light absorption index
- e. Directly proportional to the concentration and inversely proportional to the monochromatic light absorption index

203. Select a metallochromic indicator from the list below.

- a. Starch
- b. Litmus
- c. Eosin
- d. Methyl orange
- e. Murexide

204. Specify the standard solution (titrant) for the iodometric determination of oxidants:

- a.  $K_2Cr_2O_7$
- b.  $Na_2S_2O_3$
- c.  $I_2$
- d.  $KMnO_4$
- e.  $KBrO_3$

205. What cation of the V analytical group (acid-base classification) is present in the solution, if a black precipitate is produced when tin(II) chloride dissolved in an alkaline medium is added into this solution?

- a. Manganese(II)
- b. Iron(II)
- c. Antimony(III)
- d. Iron(III)
- e. Bismuth(III)

206. An anxiolytic agent, a benzodiazepine derivative, was prescribed to a patient with a neurosis in order to reduce its signs. What medicine belongs to this group of drugs?

- a. Nandrolone

**b. Diazepam**

- c. Piroxicam
- d. Trihexyphenidyl
- e. Atropine sulphate

207. During ultrasound investigation a patient was diagnosed with bilateral renal artery stenosis of atherosclerotic genesis. Specify the bioactive substance that due to its excessive secretion is the key component of arterial hypertension pathogenesis in the given case:

- a. Noradrenaline
- b. Thyroxin

**c. Renin**

- d. Cortisol
- e. Vasopressin

208. To accurately calculate the reaction velocity constant by the activation energy value, the steric factor is used, which takes into account:

- a. Temperature of the reaction mixture
- b. Structure of the molecules in the interacting compounds

**c. Mutual orientation of the reacting molecules**

- d. Concentration of the reactants
- e. Chemical properties of the interacting compounds

209.  $C_7H_8O$  compound is an aromatic carbohydrate derivative and does not color with  $FeCl_3$ . Upon oxidation, it forms benzoic acid. Name this compound:

- a. m-Cresol
- b. Methylphenyl ether

**c. Benzyl alcohol**

- d. o-Cresol
- e. p-Cresol

210. To quickly relieve the state of acute psychosis, the patient was prescribed a rapid/short-acting psychotropic drug. Name this drug:

- a. Piracetam
- b. Valerian extract
- c. Amitriptyline
- d. Caffeine and sodium benzoate

**e. Droperidol**

211. In gas-liquid chromatography the substances being analyzed are entered into the stream of a carrier gas. This gas must meet the following condition:

- a. Rate of movement through the column
- b. High thermal conductivity
- c. High molecular weight

**d. Inert to the stationary phase and the substances being analyzed**

- e. Affinity for the stationary phase

212. Hormone-like substances from the group of eicosanoids can be used to stimulate labor activity during childbirth and as contraceptives. What substances have this effect?

- a. Interleukins

**b. Prostaglandins**

- c. Angiotensins
- d. Endorphins
- e. Enkephalins

213. Name the plants that have adapted to growing in an arid environment and developed a number of mechanisms to reduce the moisture loss.

- a. Succulents
- b. Hygrophytes

**c. Xerophytes**

- d. Mesophytes
- e. Hydrophytes

214. A 58-year-old man presents with a peripheral circulation disorder with a restricted arterial inflow, paleness of the affected area, and decrease of partial oxygen pressure in the affected area. Name this disorder:

- a. Venous hyperemia
- b. Reperfusion syndrome
- c. Arterial hyperemia
- d. Thrombosis
- e. Ischemia**

215. Plants that grow in moderately humid conditions belong to the following ecological group:

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

216. Explain to a young physician, how to prevent withdrawal syndrome in a patient after completion of glucocorticoid therapy:

- a. Vitamin preparations
- b. Antidotal therapy
- c. Gradual decrease of the dose**
- d. CNS stimulants
- e. Immunostimulating therapy

217. The process of putrefaction is a component of physicochemical changes that occur with food proteins in the human gastrointestinal tract. What product is excreted with the urine and is an indicator of the intensity of the protein putrefaction in the large intestine?

- a. Cholesterol
- b. Bilirubin
- c. Ammonia
- d. Benzene
- e. Indican**

218. What titrimetric method of analysis requires the use of both external and internal indicators?

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

219. Microscopy of a plant stem revealed a complex tissue, consisting of sieve-like tubes with satellite cells, bast fibers, and bast parenchyma. Name this tissue:

- a. Periderm
- b. Rhytidoma
- c. Epidermis
- d. Phloem**
- e. Xylem

220. Some leaf cells have lignified membranes. These cells are called:

- a. Collenchyma
- b. Sclereids**
- c. Companion cells
- d. Trichomes
- e. Sieve tubes

221. During a morphological description of *Salvia sclarea*, students noticed its bright bracts. They

serve to attract pollinating insects and are a modification of a:

- a. Shoot
- b. Pedicel
- c. Receptacle
- d. Leaf**
- e. Androecium

222. A tumor of the adenohypophysis disturbs the synthesis of tropic hormones and causes acromegaly. What hormone would exhibit elevated levels in this case?

- a. Luteinizing
- b. Somatotropin**
- c. Oxytocin
- d. Vasopressin
- e. Follicle-stimulating

223. Hydrolysis reaction will NOT occur with:

- a. Cellulose
- b. Glycerol**
- c. Protein
- d. Starch
- e. Fat

224. A patient with signs of cardiac glycosides intoxication was prescribed Unithiol. What is the mechanism of drug action in this case?

- a. Reactivation of membrane  $K^+$ ,  $Na^+$  -adenosine triphosphatase**
- b. Binding of ionized  $Ca^{2+}$
- c. Induction of cardiac glycoside metabolism
- d. Increased  $Na^+$  content in the myocardium
- e. Increased inflow of  $K^+$  to cardiomyocytes

225. Pharmacy sells glaucine hydrochloride to a patient with chronic bronchitis. What common side effect should he be warned about?

- a. Excitation of central nervous system
- b. Increase of intraocular pressure
- c. Allergic skin rashes
- d. Disruption of cardiac rate
- e. Decrease of arterial pressure**

226. What indicators are used to determine the titration endpoint in the acid-base titration method?

- a. Metal indicators
- b. pH indicators**
- c. Adsorption indicators
- d. Luminescent indicators
- e. Redox indicators

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

- a. Interferon
- b. Thyroglobulin**
- c. Albumin
- d. Immunoglobulin
- e. Histone

228. Common nettle, hop, black elderberry relate to the plants that require soils rich in nitrogen compounds, that is, such plants are called:

- a. Nitrophytes**
- b. Nitrophobes
- c. Halophytes
- d. Calciphiles

e. Calciophobes

229. A 30-year-old patient has been hospitalized with complaints of increased body temperature, jaundice, and hemorrhagic rash on the skin and mucosa. A few days later, the patient developed acute renal failure. Microscopy of smears stained using the Romanowsky-Giemsa technique revealed twisting bacteria with secondary coils shaped like letters S and C) What bacteria are the most likely cause of the patient's disease?

a. Leptospira

- b. Salmonella
- c. Treponema
- d. Bordetella
- e. Borrelia

230. Lipid digestion requires lipases, emulsifiers, and a slightly alkaline pH. What segment of the gastrointestinal tract provides these conditions?

a. Duodenum

- b. Large intestine
- c. Stomach
- d. Esophagus
- e. Oral cavity

231. What drug has an anxiolytic and anticonvulsant effect?

a. Phenobarbital

b. Diazepam

- c. Droperidol
- d. Aminazine (Chlorpromazine)
- e. Reserpine

232. Upon taking a herbal medicine, a 30-year-old patient has developed anaphylactic allergic reaction. Blood leukocytosis was observed. What kind of leukocytosis is characteristic of this case?

- a. Monocytosis
- b. Neutrophilia
- c. Basophilia

d. Eosinophilia

e. Lymphocytosis

233. When dividing cations into analytical groups according to the acid-base classification, the group reagents can be acids or bases. What acids are used as group reagents?

- a.  $\text{H}_3\text{PO}_4$ ,  $\text{H}_2\text{C}_2\text{O}_4$
- b.  $\text{HClO}_4$
- c.  $\text{H}_2\text{CO}_3$

d.  $\text{HCl}$ ,  $\text{H}_2\text{SO}_4$

e.  $\text{HNO}_3$ ,  $\text{CH}_3\text{COOH}$

234. During the morphological analysis of a flower, the presence of a reduced perianth in the form of two membranes - lodicules - was established. Its stamens have long staminal filaments. Its pistil has a feathery stigma. This description is characteristic of the plants that belong to the following family:

a. Poaceae

- b. Lamiaceae
- c. Convallariaceae
- d. Pinaceae
- e. Alliaceae

235. A 56-year-old man with ischemic heart disease was prescribed metoprolol. What is the mechanism of action of beta-blockers in ischemic heart disease?

- a. Reduction of the peripheral vessel tone
- b. Constriction of the coronary vessels
- c. Increase of the myocardial oxygen demand
- d. Reduction of the myocardial oxygen demand

e. Dilation of the coronary vessels

236. In course of long-term treatment of an infectious patient with penicillin, the pathogen transformed into the L-form. What changes occur in the pathogen cell in case of L-transformation?

- a. Absence of a spore
- b. Absence of inclusions
- c. Absence of a capsule
- d. Absence of a cell wall**
- e. Absence of flagella

237. Number of freedom degrees at the point of intersection of liquidus with Y-axis on the fusibility chart of a two-component system would equal:

- a. 1
- b. 2
- c. 3
- d. 4
- e. 0**

238. A patient is pale, has goose bumps and chills. What stage of fever is it characteristic of?

- a. Temperature increase**
- b. Compensation
- c. Continuous fever
- d. Latent stage
- e. Temperature decrease

239. Specify the substance that results from the following reaction:  $\text{CH}_3\text{CHO} \xrightarrow{\text{H}_2} \text{CH}_3\text{CH}_2\text{OH}$ , medspace  $\text{Hg}^{2+}$  ?

- a. Ethanal**
- b. Ethanol
- c. Acetic acid
- d. Propanone
- e. Propanal

240. In qualitative analysis, a reaction with an iodine solution is used to detect arsenite ions. What is used to create the medium for this purpose?

- a. Nitric acid solution
- b. Saturated solution of sodium hydrogencarbonate**
- c. Ammonia solution
- d. Sulfuric acid solution
- e. Acetic acid solution

241. Most antidepressants are nonselective monoamine oxidase inhibitors (MAOIs) --- they inhibit flavin-containing enzymes that catalyze oxidative deamination of monoamines in the mitochondria of brain neurons. Name the coenzyme of MAO:

- a. Nicotinamide adenine dinucleotide
- b. Flavin adenine dinucleotide**
- c. Coenzyme A
- d. Pyridoxal phosphate
- e. Thiamine pyrophosphate

242. Emulsions containing less than 0,1% of dispersed phase (in volume) are classified as:

- a. Water-in-oil type
- b. High-concentration
- c. Concentrated
- d. Diluted**
- e. Oil-in-water type

243. In a plant being studied, epidermis of some of the leaves has a thick cuticle and a layer of wax on the surface, while epidermis of the other leaves has scales or numerous trichomes and only a few

stomata. What group does this plant belong to?

- a. Xerophytes
- b. Hygrophytes
- c. Mesophytes
- d. Ephemerals
- e. Hydrophytes

244. As a result of an accident (snakebite) a male patient has the following blood values: Hb- 80 g/l, RBC-  $3,0 \cdot 10^{12}/l$ ; WBC-  $5,5 \cdot 10^9/l$ . What type of anemia is observed in this case?

- a. Iron-deficiency
- b. Posthemorrhagic
- c. Folic acid-deficiency
- d. Aplastic
- e. Hemolytic

245. To treat atherosclerosis a patient has obtained hypolipidemic agent - Fenofibrate - from pharmacy. What is the pharmacological group of this drug?

- a. Muscarinic cholinergic receptor antagonists
- b. Nitrofuranes
- c. beta-adrenergic blocking agents
- d. Fibrates
- e. Calcium channel blocking agents

246. What cations have the highest mobility among those listed below?

- a. Ammonium cations
- b. Lithium cations
- c. Hydroxonium cations
- d. Potassium cations
- e. Sodium cations

247. Smears prepared from the cerebrospinal fluid sediment and stained using the Gram technique are studied in diagnostics of meningitis. What finding confirms the diagnosis of meningococcal infection?

- a. Lancet-shaped Gram-positive diplococci
- b. Diplococci enclosed within a capsule
- c. Gram-negative diplococci located inside leukocytes and outside of them
- d. Gram-negative coccobacteria located inside leukocytes
- e. Gram-positive diplococci located inside leukocytes

248. A patient suffers from block of cytochrome oxidase enzyme caused by cyanide poisoning. What type of hypoxia is developed in this case?

- a. Hemic
- b. Circulatory
- c. Stagnant
- d. Respiratory
- e. Tissue

249. Megaloblasts and a high color index were detected in the patient's blood. The diagnosis of megaloblastic anemia was established. What drug should be prescribed in this case?

- a. Cyanocobalamin
- b. Pyridoxine
- c. Tocopherol acetate
- d. Rutin
- e. Ascorbic acid

250. What substances given below are not surfactants?

- a. Alcohols and soaps
- b. Aldehydes and alcohols
- c. Carboxylic acids and soaps

**d. Inorganic acids, bases, and their salts**

e. Amines and sulfonic acids

251. What reagent is used to detect and photometrically determine Fe(II) and Fe(III) cations?

**a. Sulfosalicylic acid**

b. Phenylacetic acid

c. Chloroacetic acid

d. P-aminobenzoic acid

e. Oxalic acid

252. The ornithine cycle is the main way of ammonia neutralization in the human body. What substance is the end product of ammonia neutralization?

a. Carbamoyl phosphate

b. Arginine

c. Uric acid

d. Citrulline

**e. Urea**

253. What hormone can provoke an increase in blood pressure and elevated blood levels of glucose and lipids in a patient with hypotension, who has taken it as a component of a drug?

a. Folliculin

**b. Adrenaline**

c. Insulin

d. Testosterone

e. Progesterone

254. Enzymes are widely used as drugs in pharmacy. What is the main feature that separates enzymes from non-biological catalysts?

**a. High specificity and selectivity**

b. High dispersion

c. High homogeneity

d. High universality

e. Low universality

255. An athlete is recommended to take carnitine to improve his achievements. What process does carnitine activate?

**a. Fatty acids transport**

b. Glucose transport

c. Vitamin K transport

d. Amino acids transport

e. Vitamin B<sub>12</sub> transport

256. Hemoglobin catabolism results in release of iron that is transported to the bone marrow by a certain transfer protein and used again for the synthesis of hemoglobin. Specify this transfer protein:

**a. Transferrin (siderophilin)**

b. Albumin

c. Ceruloplasmin

d. Haptoglobin

e. Transcobalamin

257. Corn stalks typically have adventitious roots in their lower parts. These roots combine the functions of:

a. Assimilation and absorption

b. Retraction or contraction

c. Nutrition and respiration

**d. Nutrition and support**

e. Respiration and assimilation

258. A patient with arterial hypertension has been taking a beta-adrenergic blocker for a long time.

When his condition improved he abruptly stopped taking the drug, which resulted in sharp elevation of his blood pressure. Name this type of therapy complication:

- a. Bradycardia
- b. Dysbiosis
- c. Bronchospasm
- d. Drug tolerance

**e. Withdrawal syndrome**

259. A sample obtained from the wound of a patient with suspected gas anaerobic infection was inoculated on the Kitt-Tarozzi medium. Why must this medium be heated before the inoculation?

- a. To enrich the medium with carbon dioxide
- b. To destroy microorganisms
- c. To dissolve salts
- d. To sterilize the medium

**e. To remove oxygen**

260. A patient suffers from hyperchromic B<sub>12</sub>-deficiency anemia. What vitamin preparation should be prescribed in this case?

**a. Cyanocobalamin**

- b. Vicasol (Menadione)
- c. Retinol acetate
- d. Riboflavin
- e. Thiamine chloride

261. Proteins carry out various extremely important functions in the human body. Actin and myosin perform the following function:

- a. Receptor
- b. Transport
- c. Regulatory

**d. Contractile (motor)**

- e. Cogenetic

262. After administration of a drug, the patient presents with itching, skin rash, difficulty breathing, blood pressure of 70/40 mm Hg, and dizziness. What allergic reaction according to the Coombs-Gell classification has likely developed in the patient?

**a. Anaphylactic reaction**

- b. Cytolysis
- c. Delayed hypersensitivity reaction
- d. Arthus reaction
- e. Stimulatory hypersensitivity reaction

263. Sabin polyvalent oral vaccine is used for planned immunization of children against poliomyelitis. However, this vaccine is absolutely contraindicated for the:

- a. Children with recent medical history of infectious diseases
- b. Preschoolers
- c. Children vaccinated with Salk vaccine
- d. Adolescents

**e. Children with congenital or acquired immunodeficiencies**

264. During a preoperative examination, prothrombin deficiency was detected in the patient's blood. What must be prescribed in this case in advance to reduce the blood loss during the surgery?

- a. Phenylin (Phenindione)
- b. Thrombin

**c. Vicasol (Menadione)**

- d. Aminocaproic acid
- e. Contrykal (Aprotinin)

265. A 10-year-old boy ate 0.5 kg of sweets, which exceeds his daily energy needs. As a result, the synthesis of a certain substance will activate in this child. Name this substance.

- a. Lactose
- b. Starch
- c. Sucrose
- d. Raffinose
- e. Glycogen**

266. In the process of breathing oxygen joins with hemoglobin in lungs and makes up oxyhemoglobin as a result, which leads to release of protons from hemoglobin and production of carbonic acid. What enzyme catalyzes further transformation of carbonic acid into carbon dioxide that is exhaled from lungs?

- a. Lipase
- b. Pyruvate kinase
- c. Catalase

**d. Carbonic anhydrase**

- e. Heme oxygenase (haem oxygenase)

267. Microbiological studies of air in the pharmacy room revealed the presence of pathogenic staphylococci. Select the medium in which you can detect the lecithinase activity of the isolated microorganism:

- a. Meat-extract agar
- b. Blood agar
- c. Sugar agar
- d. Bismuth sulfite agar

**e. Yolk-salt agar**

268. Having matured, pistillate catkins of *Betula pendula* fall apart freeing nutlet seeds with:

- a. Bristly hooks
- b. Villous coma
- c. One large wing petal
- d. Two air vesicles

**e. Two membranous wing petals**

269. A woman suffering from neurosis has disturbed sleep. What drug is optimal for insomnia treatment?

- a. Aethaminalum-natrium (Pentobarbital)
- b. Bromisoval
- c. Phenobarbital
- d. Valerian tincture

**e. Nitrazepam**

270. After obtaining an antitoxic serum, its activity must be determined. For this purpose, one needs to use a reaction that is based on a combination of equal doses of immune serum and anatoxin. Name this reaction.

- a. Hemadsorption
- b. Precipitation
- c. Hemagglutination
- d. Complement fixation

**e. Flocculation**

271. A patient developed anaphylactic shock after administration of lidocaine. What antibodies cause the development of this allergic reaction?

**a. IgE**

- b. IgD
- c. IgA
- d. IgG
- e. IgM

272. Endocrinological analysis detects growth hormone deficiency in a schoolboy. What pathology can develop in the child?

- a. Acromegaly
- b. Pituitary nanism**
- c. Pituitary gigantism
- d. Pituitary cachexia
- e. Adiposogenital dystrophy

273. The patient with alcoholic cirrhosis complains of general weakness and dyspnea. The following is revealed: decrease of arterial pressure, ascites, dilation of stomach anterior wall superficial veins, esophageal varicose veins dilatation, splenomegaly. What haemodynamics disorder does the patient suffer from?

- a. Left ventricular failure
- b. Cardiac insufficiency
- c. Portal hypertension**
- d. Collapse
- e. Right ventricular failure

274. Name the primary drug of choice for treatment of narcotic analgesics overdose.

- a. Naloxone**
- b. Diazepam
- c. Calcium chloride
- d. Unithiol (Dimercaprol)
- e. Caffeine and sodium benzoate

275. A 22-year-old male was stung by bees, the affected region became hyperemic and edematous. What is the leading mechanism of edema development in this patient?

- a. Reduced oncotic pressure of blood
- b. Decreased hydrostatic blood pressure in the capillaries
- c. Increased oncotic pressure of tissue fluid
- d. Impaired lymphatic efflux
- e. Increased permeability of the capillaries**

276. Bacteriological analysis was conducted to assess the quality of the water used for pharmaceutical purposes. What value indicates the number of coliform bacteria in 1 liter of water?

- a. Enterococcus titer
- b. Coli index**
- c. Perfringens titer
- d. Microbial number
- e. Coliphage titer

277. A diuretic should be prescribed for treatment of cerebral edema. What drug is to be administered?

- a. Diacarb (Acetazolamide)
- b. Furosemide**
- c. Spironolactone
- d. Hydrochlorothiazide
- e. Caffeine and sodium benzoate

278. The cells of Brassica oleracea leaves contain a certain vitamin that facilitates healing of gastric and duodenal ulcers. It is vitamin:

- a. U**
- b. A
- c. C
- d. E
- e. K

279. The secondary structure of eukaryotic DNA is a double helix. What bonds keep the strands of DNA molecule together?

- a. Hydrogen**
- b. Ester

- c. Glycosidic
- d. Disulfide
- e. Peptide

280. What organelles in a plant cell accumulate reserve and ergastic substances and water, maintain osmotic pressure and turgor of the cell, contain cell sap, and are separated from the cytoplasm by a tonoplast?

a. Vacuoles

- b. Chloroplasts
- c. Lysosomes
- d. Ribosomes
- e. Mitochondria

281. Sodium hexanitrocobaltate(III) is used to determine the presence of potassium cations in a solution. What visual analytical effect is observed in this case?

- a. Formation of a black precipitate
- b. Formation of a blue precipitate
- c. Formation of a yellow precipitate
- d. Formation of a white precipitate
- e. Formation of a violet precipitate

282. A 71-year-old woman with cholecystitis developed a yellow tint to her skin and mucosa. She was diagnosed with mechanical jaundice. The change in the patient's skin coloring occurred due to elevated levels of the following substance in her blood:

a. Conjugated bilirubin

- b. Unconjugated bilirubin
- c. Stercobilinogen
- d. Urobilinogen
- e. Bile acids

283. When herbal raw material of *Calendula officinalis* and *Matricaria chamomilla* is being harvested, inflorescences of the following type are being collected:

- a. Spike
- b. Umbel
- c. Corymb
- d. Anthodium
- e. Capitulum

284. What reagent allows distinguishing between maltose (a reducing disaccharide) and sucrose (a non-reducing disaccharide)?

- a. Tollens reagent
- b.  $\text{FeCl}_3$
- c.  $\text{K}_4[\text{Fe}(\text{CN})_6]$
- d.  $\text{Br}_2$
- e.  $\text{NaOH}$

285. What carboxylic acid is an aromatic monocarboxylic acid and can be used in treatment of skin diseases as an external antiseptic and fungicide?

- a. Butyric acid
- b. Benzoic acid
- c. Acetic acid
- d. Formic acid
- e. Valeric acid

286. A diagnostic features of which family is the presence of giants or a flower tube?

- a. Heather
- b. Celery
- c. Beech trees
- d. Rose

e. Solanaceae

287. Vitamin B<sub>6</sub> is a part of the pyridoxal phosphate coenzyme (PLP). What reactions involve PLP?

- a. Synthesis of bile acids and cholesterol
- b. Synthesis of nucleic acids and phospholipids
- c. Synthesis of steroid hormones and cholesterol
- d. Decarboxylation and transamination of amino acids**
- e. Synthesis of ketone bodies and bile acids

288. What drug is prescribed for prevention of myocardial infarction, if there are contraindications to acetylsalicylic acid?

- a. Streptokinase
- b. Neodicoumarin (ethyl biscoumacetate)
- c. Phenilin (Phenindione)
- d. Ticlopidine**
- e. Heparin

289. What electrochemical method of quantitative analysis is based on measuring the amount of electric current that has been used for electrochemical reduction or oxidation of ions or elements that are being determined in the process of electrolysis?

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

290. Fenofibrate belongs to the following pharmacological group:

- a. Hypolipidemic drugs**
- b. Fibrinolysis inhibitors
- c. Antihypertensive drugs
- d. Indirect-acting anticoagulants
- e. Hypnotics

291. Illegal emigrants from Somalia were detained at the Ukrainian border. During medical examination, their 3-year-old child presents with muscle hypotonia and dystrophy, skin depigmentation, decreased turgor, and enlarged abdomen. The child is underweight. The diagnosis of kwashiorkor was made. This pathology is a type of partial starvation, namely the deficiency of:

- a. Carbohydrates
- b. Proteins**
- c. Energy
- d. Vitamins
- e. Lipids

292. Enzymes accelerate biochemical reactions, making them occur more than  $10^8$  times faster. What equation describes the rate of enzyme catalysis?

- a. Van't Hoff reaction isotherm
- b. Van't Hoff equation
- c. Arrhenius equation
- d. Law of mass action
- e. Michaelis-Menten equation**

293. Molar attenuation coefficient is the optical density of a solution with absorbent layer 1 cm thick and concentration that equals:

- a. 1%
- b. 1 g/L
- c. 1 mol/L**
- d. 1 g/mL
- e. 0.1 mol/L

294. To induce diabetes mellitus in a rabbit, beta-cells of pancreatic islets (islets of Langerhans) were selectively damaged with alloxan. What method of diabetes induction was used in this experiment?

- a. Isolated organs
- b. Introduction of enzymes, hormones
- c. Irritation
- d. Shutdown**
- e. Stimulation

295. A 70-year-old man came to a doctor with complaints of enlarged hands, feet, tongue, and facial features. Examination reveals a significant increase of somatotropin levels in the patient's blood. What causes this condition in the patient?

- a. Adenohypophyseal hyperfunction**
- b. Hypothyroidism
- c. Hyperparathyroidism
- d. Hyperfunction of the adrenal cortex
- e. Adenohypophyseal hypofunction

296. On examination the doctor suspects Cushing syndrome in the patient. This preliminary diagnosis can be confirmed by elevated levels of the following substance in the patient's blood:

- a. Cholesterol
- b. Cortisol**
- c. Retinol
- d. Adrenaline
- e. Tocopherol

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

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

298. Extreme therapeutic effect of activated carbon is due to its high specific surface area. Name the phenomenon when gases are absorbed only by the surface of a solid body:

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

299. To choose an indicator for acid-base titration, a titration curve needs to be built. This curve reflects the dependence of:

- a. Concentration of the analyzed compound from solution pH
- b. Solution pH from the volume of the solution being analyzed
- c. Solution pH from the volume of the added titrant**
- d. Solution pH from the temperature
- e. Solution pH from the concentration of the added titrant solution

300. What drug should be prescribed to inhibit the synthesis of thyroid hormones?

- a. Antistrumin (potassium iodide)
- b. Mercazolil (Thiamazole)**
- c. L-thyroxine
- d. Thyroidin
- e. Parathyroidin

301. Heating of sodium phenolate in CO<sub>2</sub> stream results in production of a certain carboxylic acid. Name the resulting compound:

- a. Benzoic acid

**b. Salicylic acid**

- c. Phenyl salicylate
- d. Aminophenol
- e. Ethyl salicylate

302. Many organic compounds break up in the cell into simple products. What compounds break up into ammonia, carbon dioxide, and water in the human body?

**a. Amino acids**

- b. Monohydric alcohols
- c. Keto acids
- d. Fatty acids
- e. Monosaccharides

303. A patient with bronchial asthma was prescribed a drug to stop an attack of the disease. The drug's mechanism of action is based on stimulation of beta<sub>2</sub>-adrenergic receptors primarily. Name this drug:

**a. Salbutamol**

- b. Droperidol
- c. Epinephrine hydrochloride
- d. Clophelin (Clonidine)
- e. Isadrine (Isoprenaline)

304. Interferons have the properties of antiviral antibiotics and natural antitumor factors, which is why they are widely used in medical practice. Their protective effects are realized by influencing a certain stage of protein biosynthesis. Name this stage.

**a. Translation initiation**

- b. Transcription termination
- c. Translation termination
- d. Translation elongation
- e. Transcription initiation

305. Having prepared a nutrient medium with carbohydrate solutions, the laboratory assistant sterilized it. What sterilization method was used?

- a. Steam under pressure
- b. Ultraviolet irradiation
- c. One-time boiling

**d. Fractional, using flowing steam**

- e. Dry heat

306. Many drugs must be manufactured under strictly aseptic conditions. One such possible source of microbiological contamination of drugs is laboratory glassware. What method should be used to sterilize the glassware?

- a. Tyndallization
- b. Pasteurization

**c. Dry heat**

- d. Boiling
- e. Ignition

307. Enzyme activity is measured to diagnose diseases of the pancreas. What enzyme must be used in acute pancreatitis?

- a. Ribonuclease

**b. Amylase**

- c. Deoxyribonuclease
- d. Alanine aminotransferase
- e. Aldolase

308. A certain reaction is successfully used for rapid diagnostics of many bacterial, viral, protozoal, and fungal diseases, as well as for detection of pathogens in the environment, food, and water. This reaction is based on the principle of repeated copying of a specific DNA segment or a single gene,

using the DNA polymerase enzyme. Name this reaction:

**a. Polymerase chain reaction**

- b. Immunofluorescence reaction
- c. Enzyme-marked antibody reaction
- d. Enzyme-linked immunosorbent assay
- e. Radioimmunoassay

309. Inhibitors of a certain enzyme from amines metabolism are used to treat depression. What enzyme is inhibited to achieve this effect?

- a. Kynurenine-3-hydroxylase
- b. Lactate dehydrogenase
- c. Monoamine oxidase with flavine adenine dinucleotide**
- d. Acetylcholinesterase
- e. Formylkynureninase (Arylformamidase)

310. Examination of children with kwashiorkor revealed facial edema, ascites, weight loss, and stunted growth. What is the most likely cause of this disease?

- a. Deficiency of unsaturated fatty acids
- b. Alimentary protein deficiency**
- c. Excess protein in the diet
- d. Excess fats and carbohydrates
- e. Carbohydrate deficiency

311. What substance is deposited in the proteoplasts of seed cells of higher plants in the form of crystals and simple and complex aleurone grains?

- a. Fatty oil
- b. Starch
- c. Inulin
- d. Protein**
- e. Glycogen

312. What medicine must be prescribed to a patient diagnosed with rheumatoid arthritis, if this patient's medical history indicates gastritis as a concomitant diagnosis?

- a. Aspirin (acetylsalicylic acid)
- b. Ibuprofen
- c. Celecoxib**
- d. Indomethacin
- e. Diclofenac

313. During what process does the entropy of a system decrease?

- a. Polymerization**
- b. Dissociation
- c. Evaporation
- d. Sublimation
- e. Dissolution

314. Examination of the sputum of a patient with suspected pneumonia detects blue-violet lanceolate cocci with a capsule, arranged in pairs. What staining method has been used to detect the capsule?

- a. Ozheshko stain
- b. Gram stain
- c. Neisser stain
- d. Ziehl-Neelsen stain
- e. Burri-Gins stain**

315. A solution being analyzed contains calcium chloride and sodium bromide. What solution must be added to the solution being analyzed, to identify the calcium ions?

- a. Ammonium oxalate**
- b. Barium chloride
- c. Sodium chloride

- d. Potassium iodide
- e. Ammonium acetate

316. In a nursery-garden some medicinal plants developed signs of a disease: there are yellow spots and necrotic foci on the leaves. Sap of the diseased plants remained infectious even after passing through a bacteria-excluding filter. No microorganisms growth was detected on the nutrient medium. What microorganisms could be the cause of this disease?

- a. Mycoplasma
- b. Viruses**
- c. Fungi
- d. Bacteria
- e. Ray fungi

317. In cases of systemic connective tissue diseases, protein and polysaccharide fragments of the connective tissue become destroyed. What protein is the main component of this tissue?

- a. Keratin
- b. Collagen**
- c. Actin
- d. Albumin
- e. Myosin

318. What titrant is used in bromatometric titration?

- a. Br<sub>2</sub>
- b. KBr
- c. KBrO<sub>4</sub>
- d. KBrO<sub>4</sub> + KCl
- e. KBrO<sub>3</sub>**

319. During a practical skill-building session, in the Konheim experiment, a student observes the dynamics of vascular reactions and changes in the blood circulation in an inflammatory focus. Name the correct sequence of the stages, characteristic of acute inflammation development:

- a. Spasm of arterioles, arterial hyperemia, venous hyperemia, prestasis, stasis**
- b. Venous hyperemia, stasis, spasm of arterioles, arterial hyperemia, prestasis
- c. Venous hyperemia, arterial hyperemia, prestasis, stasis, spasm of arterioles
- d. Arterial hyperemia, venous hyperemia, prestasis, stasis, spasm of arterioles
- e. Prestasis, stasis, spasm of arterioles, arterial hyperemia, venous hyperemia

320. A patient with type II diabetes mellitus was prescribed a synthetic drug that is a sulfonylurea derivative. Name this drug:

- a. Prednisolone
- b. Insulin
- c. Glibenclamide**
- d. Furosemide
- e. Anaprilin (Propranolol)

321. A 9-year-old child due to acute bronchitis developed elevated body temperature up to 38.5°C that lasted for a week and was then followed by a drop in the temperature down to 37.0°C. What mechanism is leading at the 3rd stage of fever?

- a. Peripheral vasodilation**
- b. Increased diuresis
- c. Increased heat production
- d. Development of chills
- e. Increased respiration rate

322. Examination of an underground organ of *Poligonatum odoratum* shows that it is horizontally oriented, uniformly thick and has nodes, internodes, round indentations, and an apical bud. Therefore, it is a:

- a. Underground stolon
- b. Main root

- c. Root crop
- d. Root tuber

**e. Rhizome**

323. What type of proenzyme activation into its active enzyme form is often used in the process of activation of hydrolases in the gastrointestinal tract?

- a. Transamination
- b. Limited proteolysis**
- c. Decarboxylation
- d. Addition of a metal cation
- e. Phosphorylation

324. A mushroom picker, who accidentally ate death cap mushroom, has been hospitalised. Death cap toxin - alpha-amanitine - inhibits RNA-polymerase II in eukaryotes. What process requires this enzyme?

- a. Recognition
- b. Translation
- c. Replication
- d. Reparation

**e. Transcription**

325. By means of photoelectrocolorimetric analysis the concentration of the following can be determined:

- a. Optically active substance
- b. Colored solution**
- c. Turbid solution
- d. Colorless solution
- e. Any type of solution

326. The Fajans-Khodakov method is used to determine the mass fraction of sodium chloride (NaCl) in a drug. What indicator is used in this titration method?

- a. Ammonium iron(III) sulfate
- b. Potassium chromate
- c. Methyl red

**d. Fluorescein**

e. Phenolphthalein

327. A patient with peptic ulcer of duodenum was taking a histamine H<sub>2</sub>-receptor antagonist. What drug of those given below belongs to this group?

- a. Gastrozepin (Pirenzepine)
- b. Omeprazole
- c. Allochol
- d. Almagel (algedrate + magnesium hydroxide)

**e. Famotidine**

328. Bacteria eventually become resistant to antibacterial agents. What enables gram-positive bacteria's resistance to penicillin antibiotics?

- a. Protein synthesis
- b. Beta-lactamases production**
- c. Active transport of antibiotics
- d. Cell wall permeability
- e. Active synthesis of peptidoglycane

329. A person suffers from a chronic inflammatory process. In the focus of the inflammation, a certain biochemical process maintains the concentration of NADPH that is necessary for the phagocytosis mechanism to occur. What process is it?

- a. Glycolysis
- b. Uric acid synthesis
- c. Ornithine cycle

d. Pentose phosphate pathway

e. Cori cycle

330. What forms of erythrocytes will be observed in a case of B<sub>12</sub> deficiency anemia?

a. Microcytes

b. Normocytes

c. Annulocytes (Codocytes)

d. Ovalocytes

e. Megalocytes

331. Crystalline lead(IV) dioxide in the presence of concentrated nitric acid is used to detect the presence of manganese(II) cations in a solution. What visual analytical effect is observed in the process?

a. The solution colors green

b. The solution colors yellow

c. The solution colors pink

d. A blue precipitate is formed

e. A white precipitate is formed

332. Azo dyes are produced as the result of:

a. Nitration

b. Diazotization

c. Amination

d. Nitrosation

e. Azo coupling

333. Coulometry is based on measuring the amount of electricity needed for an electrode reaction. What law is the basis for coulometric determination of substances?

a. Coulomb law

b. Newton law

c. Faraday law

d. Beer-Bouguer-Lambert law

e. Stokes law

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

a. Cholesterol

b. Glucose

c. Higher fatty acids

d. Pyruvate

e. Glucuronic acid

335. There are plants selected, that have tubular, ligulate, pseudoligulate and funnelliform flowers, clustered in simple flowerheads. These plants belong to the following family:

a. Asteraceae (Compositae)

b. Valerianaceae

c. Solanaceae

d. Ericaceae

e. Tiliaceae

336. In pine wood, essential oils accumulate in the passages that inside are lined with a layer of secretory cells. Name these structures:

a. Articulated laticifers

b. Glandules

c. Lysigenous cavities

d. Non-articulated laticifers

e. Schizogenous cavities

337. What substance is a mediator of delayed-type hypersensitivity?

- a. Prostaglandins
- b. Bradykinin
- c. Serotonin

**d. Lymphokines**

- e. Histamine

338. A patient has bradycardia, moderate hypotension, decreased basal metabolism, and edemas. What disorder is the likely cause of these signs?

- a. Hyperparathyroidism

**b. Hypothyroidism**

- c. Adrenal hypofunction
- d. Hypoparathyroidism
- e. Hyperthyroidism

339. What is represented by such a pharmacokinetic value of a drug as its biological half-life ( $T_{1/2}$ )?

- a. Blood plasma volume cleared of drug within a time unit
- b. Period of total body clearance
- c. Renal clearance rate
- d. Correlation between the drug clearance rate and plasma drug concentration

**e. Time period in which plasma drug concentration decreases by 50%**

340. Microscopy of plants detects parenchymal cells with thin membranes, a large nucleus, and a large number of ribosomes. What tissue is it?

- a. Dermal tissue
- b. Mechanical tissue

**c. Meristematic tissue**

- d. Parenchyma
- e. Secretory tissue

341. A 60-year-old man has depressive syndrome and glaucoma. Why is antidepressant amitriptyline contraindicated in this case?

- a. It acts as an alpha-blocker
- b. It acts as a muscarinic agonist
- c. It increases blood pressure

**d. It acts as a muscarinic antagonist**

- e. It is contraindicated for elderly patients

342. Mycorrhiza on the oak roots is a symbiosis of:

- a. Fungus and bacterium
- b. Bacterium and higher plant

**c. Fungus and higher plant**

- d. Fungus and alga
- e. Two different bacteria

343. What Brassicaceae family plant has a cardiotonic effect?

- a. *Capsella bursa-pastoris*
- b. *Leonurus cardiaca*

**c. *Erysimum diffusum***

- d. *Adonis vernalis*
- e. *Rheum tanguticum*

344. Cryoscopic constants of water, benzene, chloroform, acetic acid and camphor equal to 1,86; 5,12; 4,9; 3,9; 40,0 respectively. Which of these solvents should be selected for the most accurate determination of the molar mass of a drug substance (nonelectrolyte) by the cryoscopic method?

- a. Chloroform
- b. Acetic acid
- c. Water
- d. Benzene
- e. Camphor**

345. Neutralization of drugs, particularly sulfonamides, in the liver occurs by means of acetylation. Name the compound that causes acetylation reaction:

- a. S-adenosylmethionine
- b. Glutathione
- c. Acetyl-CoA**
- d. Succinyl-CoA
- e. Glycine

346. In the patient's blood plasma there are high levels of low-density and very low-density lipoproteins. These changes can indicate the following pathology:

- a. Leukaemia
- b. Gout
- c. Arthrosis
- d. Atherosclerosis**
- e. Jaundice

347. What ion has the maximum coagulating effect when added into positively charged sols?

- a.  $\text{Cl}^-$
- b.  $\text{PO}_4^{3-}$**
- c.  $\text{SO}_4^{2-}$
- d.  $\text{K}^+$
- e.  $\text{Al}^{3+}$

348. A child diagnosed with rheumatism was hospitalized. What microorganisms cause this disease?

- a. Pneumococci
- b. Streptococci**
- c. Meningococci
- d. Enterococci
- e. Staphylococci

349. The children attending a kindergarten were hospitalized with diagnosis of poliomyelitis. What was the route of infection transmission in this case?

- a. Alimentary transmission
- b. Transmission via airborne dust particles
- c. Direct contact transmission
- d. Vector-borne transmission
- e. Fecal-oral transmission**

350. A patient with hypertension has been prescribed a drug that blocks angiotensin receptors. Specify this drug:

- a. Losartan**
- b. Nifedipine
- c. Prazosin
- d. Captopril
- e. Apressin

351. A patient consulted a doctor about sunburns, decreased visual acuity. His hair, skin and eyes are not pigmented. He has been diagnosed with albinism. The patient presents with the following enzyme deficiency:

- a. Histidine decarboxylase
- b. Carbonic anhydrase
- c. Tyrosinase**
- d. Hexokinase
- e. Arginase

352. To determine the species of disease agent it is necessary to study its destructive enzymes. What enzyme of those listed below is one of them?

- a. Catalase
- b. Isomerase

c. Hyaluronidase

d. Peroxidase

e. Hydrolase

353. After severe emotional strain a 53-year-old man suddenly developed acute pain in the heart area, which irradiates to the left hand, to the neck, and under the left scapula. He noted numbness of his left hand. His face is pale and covered in cold sweat. Nitroglycerine administration stopped the pain attack after 10 minutes had passed. What is the most likely disease in this case?

a. Angina pectoris

b. Somatoform autonomic dysfunction

c. Stroke

d. Pulmonary embolism

e. Myocardial infarction

354. Which of the following reactions is required in order to obtain an azo dye out of an aromatic amine?

a. Alkylation and nitrosation

b. Salt formation and nitration

c. Diazotization and interaction with potassium cyanide

d. Diazotization and azo compound

e. Reduction and diazotization

355. What solution can be determined by the photocolorimetric method measuring self-absorbance?

a. Potassium chloride

b. Potassium chromate

c. Potassium sulphate

d. Potassium nitrate

e. Potassium phosphate

356. A 40-year-old man was prescribed antibiotics as a part of the complex therapy for peptic ulcer disease of the stomach. Which of the following combinations is indicated in this case?

a. Phenoxymethylpenicillin + lincomycin

b. Levomycetin (chloramphenicol) + ampicillin

c. Streptomycin + benzylpenicillin

d. Oxacillin + nalidixic acid

e. Amoxicillin + clarithromycin

357. A 70-year-old man with atherosclerosis complains of tinnitus both in the ears and in the head, memory deterioration, loss of working ability, and rapid fatigability. What arteries are the most affected in this man?

a. Renal arteries

b. Cerebral arteries

c. Coronary arteries

d. Intestinal arteries

e. Lower limb arteries

358. Why do alcohols have higher boiling points as compared to their isomeric ethers?

a. Ether ability to form associates

b. Increased molecular weight

c. Ability to participate in electrophilic substitution reactions

d. Formation of intermolecular hydrogen bonds

e. Dehydration ability of alcohols

359. Silver nitrate solution was added into a solution with anions of the first analytical group. A yellow precipitate was produced as the result, which indicates that this solution contained:

a. Bromide ions

b. Sulfate ions

c. Iodide ions

d. Arsenite ions

e. Arsenate ions

360. Inheritable genetic disorders can result in disturbed enzyme synthesis in the human body. What enzyme deficiency results in disturbed break-up of lactose:

- a. Invertase
- b. Maltase
- c. Peptidase
- d. Lactase**
- e. Lipase

361. Medical school graduates have received active immunization against hepatitis B, because doctors are at greater risk of contracting this disease. Name the main transmission route of this pathogen:

- a. Parenteral transmission**
- b. Contact transmission
- c. Airborne droplet transmission
- d. Alimentary transmission
- e. Waterborne transmission

362. A doctor has prescribed an adrenocortical hormone drug for a patient with bronchial asthma. Specify this drug.

- a. Diclofenac sodium
- b. Atropine sulfate
- c. Loratadine
- d. Prednisolone**
- e. Salbutamol

363. To determine the end point of an acid-base titration the following indicators are used:

- a. Luminescent indicators
- b. Redox indicators
- c. Adsorption indicators
- d. Metal indicators
- e. pH-indicators**

364. In hypoxia, lactic acid accumulates in the blood. Name the end product of anaerobic glycolysis.

- a. Lactate**
- b. Oxaloacetate
- c. CO<sub>2</sub> and H<sub>2</sub>O
- d. Malate
- e. Alanine

365. Some medicinal plants are poisonous. Select a poisonous plant from the list below:

- a. Thymus serpyllum
- b. Salvia officinalis
- c. Thymus vulgaris
- d. Digitalis purpurea**
- e. Origani vulgare

366. What process occurs as a result of electrolytes effect on a solution of a high-molecular compound?

- a. Salting out**
- b. Solvation
- c. Coacervation
- d. Thixotropy
- e. Syneresis

367. Which of the amines listed below is a primary amine?

- a. C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>N(CH<sub>3</sub>)<sub>2</sub>
- b. C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>NHCH<sub>3</sub>

c.  $C_6H_5CH_2NH_2$

d.  $C_6H_5NHCH_3$

e.  $C_6H_5N(CH_3)_2$

368. What reaction is the common reaction for detection of arsenic(III) and arsenic(V) compounds?

a. Reaction with sodium nitrate

b. Reaction with ammonium molybdate

c. Reaction with iodine

d. Reaction of reduction to arsine

e. Reaction with potassium iodide

369. Ammonium iron(III) sulfate can be used as an indicator in:

a. Argentometry, Volhard method

b. Complexometric titration

c. Acidimetry

d. Alkalimetry

e. Argentometry, Mohr method

370. What reagent allows to simultaneously detect aldehyde group and glycol fragment presence in glucose molecule?

a.  $KMnO_4$

b.  $Br_2$

c.  $Cu(OH)_2$

d.  $FeCl_3$

e.  $AlCl_3$

371. A patient suffers from Down's disease that manifests as mental retardation, shortness of stature, pathologically short fingers and toes, and eyes with mongoloid slant. Karyotype analysis revealed trisomy 21. What group of diseases does this pathology belong to?

a. Fetopathy

b. Chromosomal disorders

c. Gametopathy

d. Blastopathy

e. Molecular genetic disease

372. What particles of the micelle described by the following formula:  $m(AgCl) nAg^+ + (n-x) NO_3^- -^x + xNO_3^-$  are situated in diffusion layer?

a.  $AgCl$

b.  $AgCl$  and  $Ag^+$

c.  $NO_3^-$

d.  $Ag^+$

e.  $Ag^+$  and  $NO_3^-$

373. The patient has icteric skin; unconjugated bilirubin content in blood is high; conjugated bilirubin in urine is not detected. There is significant amount of urobilin in urine and stercobilin in feces. Name the pathology characterized by the given symptoms:

a. Hemolytic jaundice

b. Obstructive jaundice

c. Atherosclerosis

d. Jaundice of the newborn

e. Hepatocellular jaundice

374. A standard alkali solution is used to determine substances of acidic nature. This method is called:

a. Complexometry (Chelatometry)

b. Acidimetry

c. Alkalimetry

d. Redoxymetry (Oxidimetry)

e. Gravimetry

375. What optical phenomenon is most intensive in suspensions?

- a. Light transmission
- b. Light reflection**
- c. Light scattering
- d. Light refraction
- e. Light absorption

376. A female student with a cold has been prescribed an antipyretic medication. Specify this drug:

- a. Famotidine
- b. Paracetamol**
- c. Oxytocin
- d. Cyanocobalamin
- e. Ascorbic acid

377. To create a vaccine for hepatitis B prevention the gene responsible for HBsAg production was integrated into the genome of vaccinia virus. What type of vaccine is obtained in this way?

- a. Inactivated
- b. Synthetic
- c. Anatoxin
- d. Chemical
- e. Genetically engineered vaccine**

378. Exudation is an effect of inflammation-caused disruption of blood circulation. In the course of inflammatory process it starts at the following stage of vascular disorder:

- a. Arterioles spasm
- b. Venous hyperemia
- c. Arterial hyperemia**
- d. Prestasis
- e. Stasis

379. When protective action of proteins weakens, cholesterol accumulates on the vessel walls because its particles become glued together. Name this phenomenon:

- a. Sensitization
- b. Synergism
- c. Sedimentation
- d. Thixotropy
- e. Coagulation**

380. How will the rate of the chemical reaction  $2\text{NO}(\text{gas}) + \text{O}_2(\text{gas}) = 2\text{NO}_2(\text{gas})$  change if the pressure increases by three times?

- a. The rate will decrease by 27 times
- b. The rate will decrease by three times
- c. The rate will increase by 27 times**
- d. The rate will increase by three times
- e. The rate will remain unchanged

381. Name the phenomenon when one drug weakens the effect of another drug:

- a. Tolerance
- b. Antagonism**
- c. Sensitization
- d. Tachyphylaxis
- e. Potentiation

382. A patient with allergic dermatitis came to the hospital. What anti-inflammatory and anti-allergic drug must be prescribed in this case?

- a. Oxytocin
- b. Insulin
- c. Retabolil (Nandrolone)
- d. Prednisolone**

e. Ethamide

383. A 62-year-old man was hospitalized into the cardiology department in a severe condition with the diagnosis of acute myocardial infarction in the posterior wall of the left ventricle and septum, pulmonary edema. What is the primary mechanism of pulmonary edema development in this patient?

a. Acute left ventricular failure

b. Pulmonary venous hypertension

c. Decreased alveolocapillary oxygen diffusion

d. Pulmonary arterial hypertension

e. Hypoxemia

384. In order to identify the cations of zinc (II) an analytical chemist used the reagent solution of hexacyanoferrate (II) potassium (Pharmacopeia reaction). What colour would the precipitate have in this reaction?

a. Green

b. Black

c. White

d. Yellow

e. Red

385. In March, the children in a kindergarten were given a salad made from fresh cabbage stored in a cold cellar. Several hours later, many of these children developed signs of food poisoning. What microorganisms are the likely cause of poisoning in this case, considering the conditions in which they were reproducing?

a. Facultative

b. Psychrophiles

c. Resident

d. Mesophiles

e. Thermophiles

386. After the total resection of the stomach, the patient developed severe B<sub>12</sub>-deficiency anemia with impaired hematopoiesis and altered erythrocytes appearing in the blood. What forms of erythrocytes indicate this disease in the patient, if they are present in the blood?

a. Ovalocytes

b. Annulocytes (codocytes)

c. Microcytes

d. Normocytes

e. Megalocytes

387. It is known, that HIV infection leads to severe immunologic disturbances in the body that result in the development of AIDS (acquired immune deficiency syndrome). What cells of the human body are the most susceptible to HIV infection?

a. Endotheliocytes

b. T helper cells

c. Suppressor T cells

d. Hepatocytes

e. B lymphocytes

388. *Calendula officinalis* as a representative of Asteraceae family can be characterized by the following type of inflorescence:

a. Capitulum

b. Umbel

c. Corymb

d. Catkin

e. Anthodium

389. Optical activity of monosaccharides can be explained by their:

a. Asymmetric carbon atoms in a molecule

b. Number of hydroxyl groups in a molecule

- c. Aldehyde or ketone group
- d. Complicated rotation around sigma-bond
- e. Asymmetric crystal

390. Among NSAIDs, the least damaging effect on the gastrointestinal mucosa is characteristic of:

- a. Celecoxib**
- b. Acetylsalicylic acid
- c. Naproxen
- d. Diclofenac
- e. Butadion (Phenylbutazone)

391. When smeared with turpentine, the rabbit's tongue turns red and its blood supply increases. What type of arterial hyperemia occurs in this case?

- a. Neurotonic hyperemia**
- b. Reactive hyperemia
- c. Work hyperemia
- d. Metabolic hyperemia
- e. Neuroparalytic hyperemia

392. What factor will cause an increase in glomerular filtration in the kidneys?

- a. Reduced oncotic blood pressure**
- b. Increased intra-renal pressure
- c. Increased oncotic blood pressure
- d. Reduced number of functioning glomeruli
- e. Reduced hydrostatic pressure in the glomerular capillaries

393. Select from the list an adsorption indicator:

- a. Eosin**
- b. Phenolphthalein
- c. Sulfosalicylic acid
- d. Eriochrome black T
- e. Methyl-orange

394. Name the process of spontaneous adhesion of drops in an emulsion to each other:

- a. Coalescence**
- b. Coagulation
- c. Flocculation
- d. Flotation
- e. Sedimentation

395. What is the generative reproductive organ of gymnosperms and angiosperms?

- a. Flower
- b. Fruit
- c. Seed**
- d. Macro- and microspores
- e. Strobilus

396. Interleukin-1 is one of the secondary pyrogens in a fever. What cells are the main producers of this pyrogen?

- a. Lymphocytes
- b. Macrophages**
- c. Eosinophils
- d. Tissue basophils
- e. Platelets

397. Racemose clusters of calcium carbonate crystals are detected among the waste products of a protoplast. These crystals are:

- a. Crystal druses
- b. Raphides

c. Styloid crystals

**d. Cystoliths**

e. Isolated crystals

398. Lipids are a group of water-insoluble substances of various structure that carry out a number of functions. What lipids form a protective layer over skin, fur, or feathers of animals?

a. Phospholipids

b. Cholesterol esters

c. Glycolipids

**d. Waxes**

e. Triglycerides

399. What nonsteroidal anti-inflammatory drug selectively inhibits COX-2 and has no ulcerogenic effect?

**a. Celecoxib**

b. Diclofenac sodium

c. Ibuprofen

d. Paracetamol

e. Acetylsalicylic acid

400. Air contamination with pathological microorganisms can be determined by the presence of indicator bacteria. Specify the bacteria that indicate immediate epidemiologic danger:

a. Sarcinae

**b. Hemolytic streptococci**

c. Mold fungi

d. Micrococci

e. Yeast fungi

401. A certain meristematic tissue is located in the vascular bundles of the stem between the secondary phloem and the secondary xylem. What type of meristematic tissue is it?

**a. Cambium**

b. Phellogen

c. Procambium

d. Dermatogen

e. Pericycle

402. A child presents with increased nervous excitability, spontaneous tetany attacks, dry skin, brittle nails and hair, and subcutaneous calcifications in the area of the auricles. What hormone is deficient in this case, causing the described changes?

a. Vasopressin

b. Progesterone

c. Oxytocin

**d. Parathyroid hormone**

e. Thyroid hormones

403. A characteristic reaction between sodium sulfide and the salts of an unknown cation has produced a white precipitate. What cation was it?

a. Copper

b. Magnesium

**c. Zinc**

d. Mercury

e. Lead

404. Antiparkinsonian drugs are classified based on the mechanism of their action in the body. What drug is a dopamine precursor?

**a. Levodopa**

b. Selegiline

c. Bromocriptine

d. Midantan (Amantadine)

e. Cyclodol (Trihexyphenidyl)

405. A 45-year-old man suffers from antacid gastritis. In this case, disturbed production of the following substance can be observed in the patient's stomach:

- a. Mucus
- b. Gastricsin
- c. Intrinsic antianemic factor
- d. Pepsin

**e. Hydrochloric acid**

406. A doctor has prescribed the patient a dopamine precursor for treatment of Parkinson's disease. After administration of this drug, the patient's mobility and mental processes improved and the ability to concentrate was restored. The maximum effect was observed after a month of treatment. Name this drug:

- a. Midantan (Amantadine)
- b. Cyclodol (Trihexyphenidyl)
- c. Selegiline

**d. Levodopa**

e. Bromocriptine

407. Select ketose from the monosaccharides listed below:

- a. Glucose
- b. Arabinose
- c. Ribose

**d. Fructose**

e. Mannose

408. Pathogenic microorganisms are characterized by presence of aggression enzymes that determine their virulence. Select the aggression enzyme:

- a. Oxidase
- b. Hyaluronidase**
- c. Carbohydrase
- d. Lyase
- e. Transferase

409. What method of titrimetric analysis requires the use of both external and internal indicators?

- a. Permanganatometry
- b. Complexometric titration
- c. Nitrite titration**
- d. Argentometry
- e. Alkalimetry

410. For diagnostics of meningitis, smears of the cerebrospinal fluid sediment, stained using the Gram technique are being studied. What finding can confirm the diagnosis of meningococcal infection?

- a. Diplococci surrounded by a capsule
- b. Gram-negative diplococci located within leukocytes and outside of them**
- c. Gram-positive diplococci located within leukocytes
- d. Gram-negative cocci bacteria located within leukocytes
- e. Lancet-shaped Gram-positive diplococci

411. Microscopy of a rhizome revealed periphloematic vascular bundles. What plant does it belong to?

- a. *Potentilla erecta*
- b. *Dryopteris filix-mas***
- c. *Convallaria majalis*
- d. *Acorus calamus*
- e. *Elymus repens*

412. An analytical chemist conducts a systematic analysis of a mixture of anions. What reagents are used in the test for oxidizing anions?

- a. KI in the presence of chloroform
- b. AgNO<sub>3</sub> in the presence of HNO<sub>3</sub>
- c. HCl in the presence of amyl alcohol
- d. Ba(NO<sub>3</sub>)<sub>2</sub>
- e. Na<sub>2</sub>C<sub>2</sub>O<sub>4</sub>

413. Name the process, when the precipitate obtained as a result of coagulation transforms into a stable colloidal solution.

- a. Flocculation
- b. Colloidal protection
- c. Micelle formation

**d. Peptization**

- e. Heterocoagulation

414. Ultramicroscopy is used to determine the radius of dispersed phase particles. The following should be measured to make the necessary calculations:

- a. Distance traveled by a tagged particle
- b. Number of particles in a definite volume**
- c. Intensity of transmitted light
- d. Intensity of scattered light
- e. Time interval in which a tagged particle travels a certain distance

415. A patient with frequent recurrent chronic bronchitis is prescribed a sulfanilamide drug. This drug is an analog of the following compound:

- a. Formic acid
- b. Citric acid
- c. Uric acid

**d. P-aminobenzoic acid**

- e. Lactic acid

416. A girl with type 1 diabetes mellitus has developed chronic kidney failure. What complication of diabetes is the cause of diabetic nephropathy in this case?

- a. Fetopathy
- b. Macroangiopathy

**c. Microangiopathy**

- d. Neuropathy
- e. Retinopathy

417. The following ion has the highest coagulation ability for iron hydroxide sol with positively charged granules:

- a. Chloride
- b. Nitrate

**c. Sulfate**

- d. Calcium
- e. Sodium

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

- a. Compensatory dialysis
- b. Electrodialysis

**c. Dialysis**

- d. Ultrafiltration
- e. Decantation

419. A patient with essential hypertension has been prescribed a drug with an antianginal, hypotensive, and antiarrhythmic effect. Name this drug.

- a. Epinephrine
- b. Fenoterol

c. Dopamine hydrochloride

**d. Metoprolol**

e. Clonidine

420. Separation of substances in gas-liquid chromatography occurs due to the different speed of movement of substances through the column. What is the mobile phase in this method of analysis?

a. Liquid phases

b. Water

c. Organic solvent

d. Solid carrier

**e. Carrier gas**

421. A 71-year-old woman with cholecystitis has developed mechanical jaundice. What type of arrhythmia will develop in this case?

a. Sinus tachycardia

**b. Sinus bradycardia**

c. Extrasystole

d. Ciliary arrhythmia

e. Atrioventricular block

422. A patient was found to have a tumor of the pancreatic head, which is accompanied by the impaired patency of the common bile duct. Blood test will reveal an increase in the following substance level:

**a. Bilirubin**

b. Insulin

c. Urea

d. Hemoglobin

e. Adrenaline

423. What antifungal antibiotic is poorly absorbed in the gastrointestinal tract and is effective against intestinal candidiasis?

a. Terbinafine

b. Fluconazole

c. Griseofulvin

**d. Nystatin**

e. Ketoconazole

424. A patient with a small cut on the palm came to the dispensing chemist. What antiseptic would be advisable in this case?

a. Ketoconazole

**b. Hydrogen peroxide**

c. Flemoxin (Amoxicillin)

d. Doxycycline hydrochloride

e. Lidocaine hydrochloride

425. During a surgery, tubocurarin chloride was used as a muscle relaxant. What antagonist should the patient be given to restore spontaneous breathing?

a. Aethimizole (Methylamide)

b. Benzohexonium (Hexamethonium)

c. Cytitone (Cytisine)

**d. Proserin (Neostigmine)**

e. Dithylin (Suxamethonium)

426. Leaves of a Lamiaceae family plant are ovate, with a crenate margin, darker on the top than on the bottom, and have a characteristic lemon-like smell. These are the features of the following plant:

a. Leonurus cardiaca

b. Lamium album

c. Salvia officinalis

**d. Melissa officinalis**

e. *Mentha piperita*

427. A pregnant woman suffers from pneumonia: the term of pregnancy is 20 weeks. What chemotherapeutical drug not dangerous to development of the fetus can be prescribed to the patient?

- a. Gentamicin
- b. Levomycetin (Chloramphenicol)
- c. Sulfalene
- d. Benzylpenicillin**
- e. Ofloxacin

428. A patient with arthritis of the knee had been prescribed a certain drug for pain management. With time this drug provoked development of peptic ulcer disease of the stomach in this patient. Name this drug:

- a. Fentanyl
- b. Novocaine
- c. Diclofenac sodium**
- d. Phenobarbital
- e. Diazepam

429. What compound is obtained as the result of propylene interacting with bromine  $\text{CH}_3\text{-CH=CH}_2 + \text{Br}_2 \rightarrow$ ?

- a. 1,2-Dibromopropane**
- b. 1,1-Dibromopropane
- c. 1,3-Dibromopropane
- d. -
- e. 1,2-Dibromopropene

430. What synthetic drug of the hydrazide group is typically prescribed for pulmonary tuberculosis?

- a. Isoniazid**
- b. Rifampicin
- c. Acyclovir
- d. Metronidazole
- e. Doxycycline hydrochloride

431. Chromatographic methods can be classified by the mechanism of the separation process. What type of chromatography is gas-liquid chromatography?

- a. Adsorption chromatography
- b. Affinity chromatography
- c. Gel-filtration chromatography
- d. Distribution chromatography**
- e. Ion-exchange chromatography

432. What reaction occurs when ascorbic acid is being determined by means of iodometry?

- a. Complex formation
- b. Redox**
- c. Acylation
- d. Neutralization
- e. Precipitation

433. Serology is the main method of congenital toxoplasmosis diagnostics. What reaction is used to diagnose this pathology?

- a. Complement fixation**
- b. Precipitation
- c. Neutralization
- d. Bacteriolysis
- e. Agglutination

434. A woman presents with poor twilight vision and dry conjunctiva and cornea. What vitamin

deficiency can cause such disorders?

- a. B
- b. B<sub>12</sub>
- c. A**
- d. D
- e. C

435. A patient has been prescribed oral drug to treat diarrhea. In accordance with the WHO and Pharmacopoeia requirements 1 g (ml) of drug can contain the following number of microorganisms:

- a. No bacteria and no mold fungi
- b. 1000 bacteria and 200 mold fungi
- c. 10 bacteria and no mold fungi
- d. 100 bacteria and 10 mold fungi
- e. 1000 bacteria and 100 mold fungi**

436. Microbiological purity of tableted drugs had been tested at factory. Samples cultivation in mannitol salt agar resulted in growth of golden-yellow colonies, microscopic examination of colonies detected gram-positive globular bacteria positioned in clusters; microorganisms had plasma coagulation properties. What pure bacterial culture was obtained?

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

437. Because of its antiplatelet effect, acetylsalicylic acid is used in the treatment of diseases of the cardiovascular system. What mechanism is this effect based on?

- a. Stimulation of synthesis of E1 prostaglandins
- b. Reduction of synthesis of E2 prostaglandins
- c. Inhibition of thromboxane A<sub>2</sub> biosynthesis**
- d. Inhibition of COX-1 enzyme activity
- e. Inhibition of COX-2 enzyme activity

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

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

439. A certain perennial alkaloid-containing plant is widely used in medicine. It has the following features: pinnately dissected leaves with light green upper surface and bluish lower surface; regular bisexual flowers with double perianth, attached to long peduncles, located in the axils of narrow sharp bracts, and clustered together in umbel inflorescences; the fruit is a siliquiform capsule; the plant produces an orange milky sap. These biological features are characteristic of:

- a. *Vinca minor*
- b. *Chelidonium majus***
- c. *Papaver somniferum*
- d. *Atropa belladonna*
- e. *Datura stramonium*

440. A 50-year-old man with a history of alcoholic cirrhosis complains of dyspeptic disorders and bleeding from hemorrhoidal veins. Examination detects ascites and distended superficial veins of the anterior abdominal wall. What pathology is indicated by these signs?

- a. Portal hypertension**
- b. Intestinal obstruction
- c. Peptic ulcer disease

- d. Enterocolitis
- e. Hepatitis

441. Long-term use of antibiotics can result in development of dysbiosis. What method can detect intestinal dysbiosis?

- a. Patient interview
- b. Bacteriology**
- c. Gnotobiotic experiments
- d. Allergy testing
- e. Serology

442. What compound will react with propane under the given conditions?

- a. Br<sub>2</sub>, hν, 20°C**
- b. H<sub>2</sub>SO<sub>4</sub> concentrated
- c. HNO<sub>3</sub> concentrated
- d. CH<sub>3</sub>COONO<sub>2</sub>
- e. Cl<sub>2</sub>, FeCl<sub>3</sub>

443. What analytical method can be used to quantify hydrogen peroxide without any special indicators?

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

444. Complex biological systems contain components such as electrolytes, non-electrolytes, and proteins that together create osmotic pressure. What part of osmotic pressure is formed primarily by proteins?

- a. -
- b. Cellular pressure
- c. Oncotic pressure**
- d. Biological pressure
- e. Internal pressure

445. Emulsions are classified according to the volume concentration of dispersed phase. An emulsion with the concentration at the rate of 0,1-74,0% vol. relates to the following group of emulsions:

- a. Concentrated**
- b. Highly concentrated
- c. Reversible
- d. Direct
- e. Diluted

446. A pharmacy produces eye drops and dispenses them into sterile vials. What method should be used to sterilize the vials?

- a. Ultraviolet irradiation
- b. Boiling
- c. Dry heat box**
- d. Autoclaving
- e. Disinfectant solutions

447. The process of glycolysis starts with irreversible reaction of glucose transforming into glucose 6-phosphate. What enzyme catalyzes this reaction?

- a. Catalase
- b. Aldolase
- c. Lipase
- d. Hexokinase**
- e. Creatine kinase

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

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

449. Solutions of some electrolytes are used as medicines. What is the maximum value of the isotonic coefficient for  $\text{MgSO}_4$  solution?

- a. 4
- b. 3
- c. 7
- d. 5
- e. 2**

450. What anions form a precipitate soluble in 12% ammonium carbonate solution as a result of their interaction with a silver(I) nitrate solution?

- a. Chloride ions**
- b. Sulfide ions
- c. Iodide ions
- d. Bromide ions
- e. Thiocyanate ions

451. Indicator microorganisms are being analyzed in the process of sanitary microbiological assessment of the environment, food, water, and commodities. Quantitative indicators of pollution are being measured, as well as the presence of certain microbial species. What value characterizes total microbial contamination in 1 gram of a solid substance or in 1 milliliter of a liquid?

- a. Perfringens index
- b. Coli titer
- c. Microbial count**
- d. Coli index
- e. Perfringens titer

452. According to the Smoluchowski theory of rapid coagulation, the coagulation process can be described using the following type of kinetic equation:

- a. First-order equation
- b. Second-order equation**
- c. Zero-order equation
- d. Third-order equation
- e. Fractional-order equation

453. Quantitative determination of iodides by Fajans method is performed with adsorption indicators. The following can be used as an adsorption indicator:

- a. Phenolphthalein
- b. Murexide
- c. Eosin**
- d. Diphenylamine
- e. Methyl orange

454. A fruit is a capsule with oblate light brown smooth glossy seeds that mucify when moistened. This fruit belongs to:

- a. *Hypericum perforatum*
- b. *Ledum palustre*
- c. *Linaria vulgaris*
- d. *Digitalis purpurea*
- e. *Linum usitatissimum***

455. A patient with acute cardiac infarction was undergoing anticoagulant therapy with inhibitor of

antithrombin III that prevents intravascular blood clotting. Name the compound with anticoagulating effect:

- a. Heparin
- b. Tetracycline
- c. Hyaluronic acid
- d. Chondroitin sulfate
- e. Histamine

456. A man has been hospitalized into the intensive care unit in a severe condition after carbon monoxide poisoning. What substance has formed in this case, causing the severe condition in the patient?

- a. Fetal hemoglobin
- b. Oxyhemoglobin
- c. Methemoglobin
- d. Carbhemo-globin
- e. Carboxyhemoglobin

457. In microbiology class students have been growing pure bacterial culture. Bacterial inoculation of solid medium was performed to obtain separate visible colonies, resulting in two colonies, R-type and S-type, grown in thermostat after one day of incubation. What properties of microorganisms were described by students?

- a. Morphologic
- b. Biochemical
- c. Cultural
- d. Tinctorial
- e. Antigenic

458. A man presents with signs of albinism: blonde hair, extreme photosensitivity, impaired vision. What amino acid metabolism is disturbed in the patient?

- a. Tyrosine
- b. Valine
- c. Histidine
- d. Proline
- e. Methionine

459. Microscopy of a root detects root hairs, which are the cell growths of:

- a. Endodermis
- b. Epidermis
- c. Exodermis
- d. Epiblem
- e. Mesoderm

460. A sterile form of *Inonotus obliquus* xylotrophic fungus was sampled from the trunk of *Betula pendula*. Its alternative names include "birch fungus" and:

- a. Fly agaric
- b. Ergot
- c. Chaga mushroom
- d. Champignon
- e. Tinder fungus

461. Suppositories are widely used in medicine. What requirement should their aggregative stability meet?

- a. Must not disintegrate
- b. Melting point of  $37^{\circ}\text{C}$
- c. Must not dissolve
- d. Must be non-volatile
- e. Must be solid

462. Oxidation of carbohydrates, amino acids, and fatty acids generally occurs via tricarboxylic acid

cycle. Specify the acid with which acetyl-CoA reacts first in the tricarboxylic acid cycle:

- a. Isocitric
- b. Citric
- c. Malic
- d. Oxaloacetic**
- e. Fumaric

463. In human body, thyroxine is an important thyroid hormone. What microelement is necessary to synthesize this hormone?

- a. Iron
- b. Copper
- c. Calcium
- d. Potassium
- e. Iodine**

464. Select lyophilic systems among the dispersion systems listed below.

- a. Emulsions
- b. Sols
- c. Surfactant solutions**
- d. Solid foams
- e. Suspensions

465. Phenobarbital causes induction of smooth endoplasmic reticulum enzymes in the cells. As a result, the amount of active pharmaceutical ingredient decreases due to the following process:

- a. Activation of microsomal oxidation**
- b. Activation of uric acid synthesis
- c. Activation of lipid peroxidation
- d. Activation of protein peroxidation
- e. Activation of glycolysis

466. A patient with peptic ulcer disease of the duodenum was taking a histamine H<sub>2</sub> receptor blocker. Which one of the listed drugs belongs to this group?

- a. Allochol
- b. Famotidine**
- c. Mebeverine
- d. Pirenzepine
- e. Omeprazole

467. Select the hepatoprotective drugs from the list below:

- a. Allochol, Cholenzym
- b. Essentiale (Phospholipides), Thiotriasoline**
- c. Festal, Panzinorm (Pancreatin)
- d. Oxaphenamide (Osalmid), Nicodin
- e. No-Spa (drotaverine), papaverine hydrochloride

468. A woman came to a pediatrician complaining of deteriorating condition of her child. The disorder manifests in enlarged fontanelle, a delay in tooth eruption, and bone deformation. What medicine must be prescribed first in this case?

- a. Allopurinol
- b. Thiamine bromide
- c. Cyanocobalamin
- d. Cholecalciferol**
- e. Proserin (Neostigmine)

469. According to the Bancroft's rule, the dispersion medium of an emulsion will be the liquid, with which the emulsifier:

- a. Has affinity**
- b. Forms a colored compound
- c. Forms a precipitate

- d. Forms an insoluble compound
- e. Chemically interacts

470. Name the substance that is the initial compound in the polymerization reaction:

- a. Polymer
- b. Monomer**
- c. Nucleophile
- d. Dimer
- e. Polypeptide

471. Potentiometry is widely used in the analysis of medicinal products. What type of galvanic cell has the electromotive force that does not depend on the value of the standard electrode potential?

- a. Galvanic cell without ion transfer
- b. Concentration galvanic cell**
- c. Galvanic cell with ion transfer
- d. Reversible galvanic cell
- e. Chemical galvanic cell

472. What type of parenchyma usually has aleurone or starch grains and droplets of a fatty oil in its cells?

- a. Columnar parenchyma
- b. Water-storing parenchyma
- c. Spongy parenchyma
- d. Storage parenchyma**
- e. Folded parenchyma

473. Bacterioscopy of smears stained according to the Romanowsky-Giemsa technique revealed violet cocci-like microorganisms in the cytoplasm of epithelial cells. What pathogen can be characterized by its intracellular location?

- a. Shigella
- b. Chlamydia**
- c. Salmonella
- d. Streptococci
- e. Staphylococci

474. Allopurinol is used to reduce the formation of uric acid in the treatment of gout. What enzyme does this compound inhibit?

- a. Amylase
- b. Xanthine oxidase**
- c. Catalase
- d. Arginase
- e. Lactate dehydrogenase

475. A person has extremely pale skin, white hair, and blue semi-transparent irises that under bright light assume a pink hue. These signs are caused by insufficient synthesis of the following in the patient's body:

- a. Cholesterol
- b. Glucose
- c. Melanin**
- d. Phenylalanine
- e. Serine

476. What titrimetry method allows to determine quantitative content of ascorbic acid using starch as an indicator?

- a. Iodimetry**
- b. Permanganatometry
- c. Titanometry
- d. Ferrometry
- e. Nitritometry

477. If there is no strophanthin in the pharmacy stock, the following cardiac glycoside can be used as its substitute:

- a. Digitoxin
- b. Izolanid (Lanatoside C)
- c. Corglycon (Convallatoxin)**
- d. Adonisid (Adonis vernalis glycosides)
- e. -

478. In case of excessive consumption of carbohydrates, insulin stimulates the transformation of carbohydrates into lipids in the cells of adipose tissue. What process is involved in this transformation?

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

479. Laboratories of various specialization use the following method to determine general water hardness of potable water:

- a. Complexometric titration**
- b. Precipitation
- c. Oxidimetry
- d. Alkalimetry
- e. Acidimetry

480. What drug must be prescribed to treat a patient with malaria?

- a. Chloramine
- b. Tetracycline
- c. Chingamine (Chloroquine)**
- d. Sulfamethoxazole
- e. Ceftriaxone

481. A patient complains of a girdling epigastric pain. Examination reveals increased diastase levels in the patient's urine and undigested fat in the stool. These signs are the most characteristic of the following pathology:

- a. Gastritis
- b. Acute appendicitis
- c. Enterocolitis
- d. Infectious hepatitis
- e. Acute pancreatitis**

482. Anionites are the adsorbents that can:

- a. Replace their own cations with cations of the medium
- b. Adsorb ions from the medium
- c. Adsorb molecules from the medium
- d. Replace their own ions with molecules of the medium
- e. Replace their own anions with anions of the medium**

483. A patient with neurosis suffers from fear and emotional tension. To relieve these symptoms a doctor prescribed the following drug:

- a. Diazepam**
- b. Sydnocarb (Mesocarb)
- c. Lithium carbonate
- d. Nootropil (Pyracetam)
- e. Caffeine

484. What plant is a component of the pectoral herbal tea and has characteristic basal long-petiolate, broadly ovate leaves that are white and downy from below and dark green, bare, and glossy from above?

- a. *Thymus serpyllum*
- b. *Tussilago farfara***
- c. *Origanum vulgare*
- d. *Sambucus nigra*
- e. *Verbascum phlomoides*

485. Atropine sulfate belongs to the following group of drugs:

- a. alpha-adrenergic agonists
- b. Tranquilizers
- c. Muscarinic antagonists**
- d. Nicotinic antagonists
- e. beta-adrenergic agonists

486. What causes the dry cough that developed in a patient who has been taking lisinopril for a long time to treat her essential hypertension?

- a. Accumulation of angiotensin II
- b. Inhibition of angiotensin receptors
- c. Decreased renin levels
- d. Depletion of the noradrenaline reserves
- e. Increased bradykinin levels**

487. After an acute myocardial infarction, the doctor recommended the patient to take acetylsalicylic acid in the dose of 80--100 mg for 3 months. The doctor expects this drug to have the following effect in this case:

- a. Spasmolytic
- b. Analgesic
- c. Antipyretic
- d. Anti-inflammatory
- e. Antiplatelet**

488. Which pair of substances can produce an emulsion when mixed together?

- a. Menthol and camphor
- b. Soybean oil and water**
- c. Silver nitrate and water
- d. Silicon dioxide and water
- e. Urea and water

489. A structural analog of vitamin PP (nicotinic acid) is used as an antituberculous medicine. Name this medicine:

- a. Aspirin
- b. Tetracycline
- c. Streptocide
- d. Isoniazid**
- e. Riboflavin

490. An autoimmune disorder of islet beta-cells was detected in a 14-year-old girl with hyperglycemia, glycosuria, and polyuria. What type of diabetes does this girl have?

- a. Type 2 diabetes mellitus
- b. Gestational diabetes
- c. Diabetes insipidus
- d. Type 1 diabetes mellitus**
- e. -

491. One of the important diagnostic features of garden sage and motherwort is their shape of corolla. Their flowers have the following type of corolla:

- a. Funnelform
- b. Ligulate
- c. Thimble-shaped
- d. Bilabiate**

e. Pseudoligulate

492. It is determined that genetic basis of extrachromosomal stability is defined by the elements containing genes that provide for cell resistance to certain drugs, primarily antibiotics. What elements are these?

- a. Mitochondrion
- b. R-plasmids**
- c. Cytoplasm
- d. Nucleoid
- e. Golgi apparatus

493. In Ukraine all vaccinations are conducted according to the Ministry of Health decree "On preventive immunization in Ukraine and control of quality and turnover of immunobiological medical products". Which of the listed diseases is included in the national routine immunization schedule?

- a. Botulism
- b. HIV infection
- c. Rickettsiosis
- d. Influenza
- e. Poliomyelitis**

494. Because of suberization, the cell membranes do not become moistened with water, are impermeable to water and gases, and are resistant to decay. What tissue can contain suberized cells?

- a. Cambium
- b. Phelloderm
- c. Periderm**
- d. Phloem
- e. Epidermis

495. Isoelectric state of protein molecules depends on the:

- a. Mass of the solute
- b. Solution preparation technique
- c. Concentration of the solvent
- d. Shape of the protein molecule
- e. pH of the medium**

496. What is the name of the lower expanded hollow part of the pistil of a flower, where ovules are located?

- a. Gynoecium
- b. Stigma
- c. Receptacle
- d. Ovary**
- e. Stylus

497. Medicinal plants infected by microorganisms cannot be used in pharmaceutical industry. Invasive properties of phytopathogenic micro-organisms are due to the following enzymes:

- a. Lyase
- b. Oxidoreductase
- c. Transferase
- d. Hydrolytic**
- e. Isomerase

498. Bacterioscopic examination of chancre material revealed some mobile, long, convoluted microorganisms with 8-12 regular coils. These features are typical for:

- a. Leptospira
- b. Vibrios
- c. Campylobacter
- d. Borrellia
- e. Treponema**

499. What sanitary-indicative microorganisms are used for the assessment of the microbial contamination levels of potable water?

- a. *Candida albicans*
- b. *Clostridium perfringens*
- c. *Staphylococcus aureus*
- d. *Escherichia coli*
- e. *Streptococcus viridans*

500. What pair of electrodes is used in potentiometric redox titration?

- a. Silver electrode and platinum electrode
- b. Glass electrode and silver chloride electrode
- c. Platinum electrode and silver chloride electrode
- d. Copper electrode and zinc electrode
- e. Silver sulfide electrode and silver chloride electrode

501. What nutrient medium should be used by a laboratory technician to determine the total fungal count in a soft dosage form?

- a. Sabouraud agar
- b. Mannitol salt agar
- c. Bismuth sulfite agar
- d. Meat peptone agar
- e. Endo medium

502. A patient has asked the dispensing chemist to recommend him a drug that can increase the endurance of an organism in adverse environmental conditions. The chemist recommended the following:

- a. Schisandra tincture
- b. Eucalyptus tincture
- c. Oak bark decoction
- d. Camomile flowers infusion
- e. Calendula tincture

503. Amperometric titration is used in analysis of some pharmaceutical preparations. The amperometric titration method is based on the following:

- a. Ion exchange between the anionite and analyte solution
- b. Measuring the cell voltage during the titration
- c. Measuring the potential difference of the electrodes during the titration process
- d. Ion exchange between the analyte solution and cationite
- e. Determining the equivalence point by a sharp change in the diffusion current during the titration process

504. Fatty acids are being synthesized in human body. What compound is initial in this synthesis process?

- a. Acetyl-CoA
- b. Succinate
- c. Vitamin C
- d. Glycine
- e. Cholesterol

505. What drug is used as an antidote in cases of overdose with narcotic analgesics?

- a. Ephedrine
- b. Unithiol
- c. Naloxone
- d. Cordiamine (Nikethamide)
- e. Atropine

506. Polarography is one of the electrochemical methods of analysis. What parameter is used in polarographic analysis to identify the substance being analyzed?

- a. Half-wave potential

- b. Width of a polarographic wave
- c. Position of a polarographic wave
- d. Height of a polarographic wave
- e. Magnitude of the electromotive force

507. A group of tourists set off for a hiking tour into the mountains. Two hours after the departure, some of them developed tachycardia and shortness of breath, which indicates hypoxia. What type of hypoxia is the cause of these disorders?

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

508. What product forms as a result of a reaction between aniline and benzaldehyde?

- a. Hemiacetal
- b. N,N-dimethylaniline
- c. Oxime
- d. Cyanohydrin
- e. N-benzylideneaniline**

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

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

510. In a patient with jaundice, increased levels of direct bilirubin and cholemia were detected in the blood. No stercobilinogen was detected in urine. What disorder is observed in this case?

- a. Gilbert's syndrome
- b. Hemolytic jaundice
- c. Mechanical jaundice**
- d. Parenchymal jaundice
- e. Crigler-Najjar syndrome

511. Bacterial enzymes typically exhibit a high specificity of their action. In practice, this feature of bacterial enzymes is used for:

- a. Bacteria phage typing
- b. Bacteria identification**
- c. Bacteria cultivation
- d. Immunoglobulin production
- e. Bacteria serotyping

512. Calcium cations can be used as components of pharmaceuticals. Pharmacopoeial reaction for the detection of calcium cations is a reaction with a solution of:

- a. Sodium hydroxide
- b. Ammonium oxalate**
- c. Hydrochloric acid
- d. Ammonium hydroxide
- e. Potassium iodide

513. Which medicine of those listed below is the least active among the local anesthetics, poorly dissolves in water, and can be used for topical anesthesia in the form of ointments, pastes, and powders?

- a. Novocaine (Procaine)
- b. Ropivacaine
- c. Lidocaine

d. Ultracaine (Articaine)

**e. Anesthesin (Benzocaine)**

514. A 13-year-old female patient, having suffered from measles, complains of dry mouth, thirst, body weight loss, polyuria; her glucose concentration in blood is 16 mmol/l. What disease can be suspected?

a. Diabetes insipidus

b. Glycogenosis

c. Type II pancreatic diabetes

d. Steroidogenic diabetes

**e. Type I pancreatic diabetes**

515. To study the sanitary and microbiological quality of water at a laboratory, the minimum volume of water, in which bacteria of the Escherichia coli group can be detected, was determined. According to the State Standard of Ukraine, this value must be no less than:

a. 500

b. 400

c. 100

d. 200

**e. 300**

516. What drug should a doctor choose for substitution therapy after surgical removal of thyroid gland?

a. Mercazolil (Thiamazole)

b. Insulin

c. Prednisolone

d. Parathyroidine

**e. L-thyroxine**

517. A 40-year-old woman has been suffering from menorrhagia for a long time. Blood test: Hb- 90 g/L, erythrocytes -  $3.9 \cdot 10^{12}/L$ , color index - 0.69. What is the main cause of hypochromic anemia development in this case?

a. Non-absorption of iron in the body

**b. Iron loss due to bleeding**

c. Vitamin B<sub>12</sub> deficiency

d. Insufficient iron intake with food

e. Increased iron consumption

518. A plant has floating leaves with thick leathery cuticle, stratified columnar parenchyma, and spongy parenchyma with large intercellular spaces. Only the upper epidermis has stomata in it. This plant is a:

a. Sciophyte

b. Heliophyte

**c. Hydrophyte**

d. Xerophyte

e. Mesophyte

519. What physical phenomenon is measured using stalagmometry?

a. Isoelectric point

b. Osmotic pressure

c. Molecular mass

d. Concentration

**e. Surface tension**

520. The pharmacopoeial method of determining the purity of antibiotics, vitamins, etc. requires studying the movement of the dispersed phase particles in a stationary dispersion medium under the effect of a difference in potentials. Name this phenomenon.

a. Electroosmosis

b. Sedimentation potential

c. Streaming potential

**d. Electrophoresis**

e. Brownian motion

521. After a subtotal gastric resection, the patient developed B<sub>12</sub>-deficiency anemia. What cells in a blood smear are typical in this pathology?

a. Anulocytes

b. Erythroblasts

**c. Megaloblasts**

d. Normoblasts

e. Microcytes

522. Alkaptonuria is characterized by excessive urinary excretion of homogentisic acid. Development of this disease is associated with metabolism disorder of the following amino acid:

a. Alanine

b. Methionine

c. Asparagine

**d. Tyrosine**

e. Tryptophan

523. Coumarins, vitamin K antagonists, suppress the processes of blood coagulation. What protein synthesis is blocked by coumarins?

a. Gamma globulin

b. Transferrin

c. Ceruloplasmin

**d. Prothrombin**

e. Albumin

524. The study of the main root ontogenesis shows that it has developed from:

a. Apical meristem

b. Pericycle

c. Intercalary meristem

**d. Radicle**

e. Lateral meristem

525. 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. HCl

**b.  $\text{H}_2\text{SO}_4$**

c.  $\text{CH}_3\text{COOH}$

d.  $\text{HNO}_3$

e.  $\text{HClO}_4$

526. Under certain conditions, solutions of high-molecular substances can lose their flowability, meaning that the bonds begin to form between macromolecules, leading to the formation of a spatial grid. Name this process:

a. Condensation

b. Peptization

c. Coacervation

d. Coagulation

**e. Gel formation**

527. In spring a perennial plant of Asteraceae family produces floral shoots with golden-yellow flowers. After blossom-fall, shoots with large leaves appear. Name this plant:

a. *Petroselinum crispum*

b. *Hypericum perforatum*

c. *Potentilla erecta*

**d. *Tussilago farfara***

e. *Datura stramonium*

528. In *Allium cepa*, the main axis ends in an inflorescence, in which peduncles of the same length emerge from one point. What type of inflorescence is it characteristic of?

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

529. Which of the following compounds is a complex ether (an ester)?

- a.  $\text{CH}_3\text{-O-C}_2\text{H}_5$
- b.  $\text{C}_{15}\text{H}_{31}\text{COOH}$
- c.  $\text{C}_2\text{H}_5\text{OH}$
- d.  $\text{CH}_3\text{-O-CH}_3$
- e.  $\text{CH}_3\text{COOCH}_3$**

530. A student was asked, what additional functions of the root are associated with the accumulation of nutrients. These functions are:

- a. Formation of storage roots and root tubers**
- b. Primary synthesis of organic substances
- c. Maintaining the spatial position of a plant
- d. Respiration
- e. Symbiosis of the root and algae

531. A patient with gout was prescribed allopurinol - a competitive inhibitor of xanthine oxidase. Xanthine oxidase is a terminal enzyme of catabolism of:

- a. Glycoproteins
- b. Phospholipids
- c. Heteropolysaccharides
- d. Purine nucleotides**
- e. Higher fatty acids

532. Name the titrimetric method for quantitative determination of phenol and its derivatives:

- a. Ascorbinometry
- b. Permanganatometry
- c. Bromatometry**
- d. Nitritometry
- e. Cerimetry

533. Which phenomenon is uncharacteristic of aerosols?

- a. Dissociation**
- b. Thermophoresis
- c. Coagulation
- d. Photophoresis
- e. Thermoprecipitation

534. A patient has developed intestinal disbacteriosis after his long-term taking of antibiotics. What drugs should be prescribed to restore microflora up to normal amount?

- a. Eubiotics**
- b. Interferon
- c. Cephalosporines
- d. Sulfanilamides
- e. Antifungal agents

535. A 10-year-old child has height of 178 cm and body mass of 67 kg. These presentations are caused by the functional disturbance of the:

- a. Gonads
- b. Pituitary gland**
- c. Thyroid gland
- d. Adrenal glands

e. Parathyroid glands

536. Asepsis, antiseptics, disinfection, and sterilization are widely used in pharmaceutical practice. What is the correct definition of the term "asepsis"?

- a. The use of substances that kill microorganisms on the skin and mucosa
- b. Preventing microbes from contaminating any object**
- c. Complete destruction of all forms of microbes in an object
- d. The use of substances that kill pathogenic microbes in the internal environment of the body
- e. Destruction of pathogenic microbes in the environment

537. What method is used for quantification of magnesium sulfate solution for injections?

- a. Iodine monochloride titration
- b. Cerimetry
- c. Nitritometry
- d. Complexonometry**
- e. Acid-base titration

538. Name the method of sorption detoxification of the body, in which the adsorption of toxic substances occurs when the sorbent passes through the digestive system?

- a. Hemosorption
- b. Liquorosorption
- c. Enterosorption**
- d. Lymphosorption
- e. Contact therapy

539. Quantitative content of oxalic acid can be determined by means of permanganatometry. How to determine equivalence point for this kind of titration?

- a. When titrate changes its color after another drop of process solution is added**
- b. With adsorption indicator
- c. With redox indicator diphenylamine
- d. With specific indicator
- e. With pH indicator

540. The end product of starch hydrolysis is:

- a. D-galactose
- b. D-fructose
- c. Saccharose
- d. D-glucose**
- e. Maltose

541. In dental practice liquid dosage forms that contain camphor and chloralhydrate are used. What phases are in equilibrium in the eutectic point of fusibility curve of the camphor-chloralhydrate mixture?

- a. Eutectic melt, camphor crystals, chloralhydrate crystals**
- b. Eutectic melt
- c. Eutectic melt, camphor crystals
- d. Camphor crystals, chloralhydrate crystals
- e. Eutectic melt, chloralhydrate crystals

542. The surface activity of diphilic molecules can be described using the Traube-Duclos rule. How will the surface activity of fatty acids change in the area of low concentrations, if the length of the hydrocarbon radical increases by three  $-CH_2-$  groups?

- a. It will become 3 times lower
- b. It will remain unchanged
- c. It will become 27 times higher**
- d. It will become 27 times lower
- e. It will become 9 times higher

543. A patient is being consulted by the family doctor. He asks what role cholesterol plays in the

body. The doctor explains that cholesterol is a constituent part of the cell membranes and is necessary for synthesis of various substances, among which there are following hormones:

- a. Steroid hormones
- b. Eicosanoids
- c. Protein hormones
- d. Peptide hormones
- e. Amino acid derivatives

544. A 54-year-old man has requested a pharmacist's advice on drug prescription. The patient has 4-year-long history of chronic glomerulonephritis and 2-year-long history of persistent hypertension. What substance synthesized in the kidneys has important role in development of arterial hypertension?

- a. Histamine
- b. Aldosterone
- c. Nitric oxide
- d. Renin
- e. Catecholamines

545. A patient with neuritis takes diazepam. To relieve joint pain, he was prescribed an analgesic in a dose lower than the average therapeutic dose. What phenomenon did the doctor take into account when reducing the dose of the analgesic?

- a. Summation
- b. Tolerance
- c. Drug addiction
- d. Material cumulation
- e. Potentiation

546. The presence of storage proteins in a microslide prepared from *Phaseolus vulgaris* endosperm can be confirmed, if the microslide colors golden-yellow when stained with Lugol solution. In plant seeds, such protein deposits are called:

- a. Glycogen
- b. Inulin
- c. Aleurone grains
- d. Chlorophyll grains
- e. Starch grains

547. A Polygonaceae family plant has elongated lanceolate leaves with ochreae and brown spots on the upper surface of the leaf blade. These features are characteristic of:

- a. *Hypericum perforatum*
- b. *Leonurus quinquelobatus*
- c. *Polygonum hydropiper*
- d. *Polygonum persicaria*
- e. *Polygonum aviculare*

548. Acetylsalicylic acid is used in treatment of rheumatism. What biochemical links are affected by acetylsalicylic acid?

- a. Inhibits glycolysis
- b. Stimulates gluconeogenesis
- c. Inhibits prostaglandines synthesis
- d. Stimulates cholesterol synthesis
- e. Stimulates prostaglandines synthesis

549. After eating early vegetables that had high nitrite levels, a child developed hemic hypoxia. It is caused by accumulation of the following substance:

- a. Carboxyhemoglobin
- b. Methemoglobin
- c. Oxyhemoglobin
- d. Deoxyhemoglobin

e. Carbhemoglobin

550. Chlorophyta division representatives have chromatophores of various shapes in their cells. What genus includes species with ribbon-shaped chromatophores?

- a. Chlorella
- b. Chlamidomonas
- c. Volvox
- d. Spirogyra**
- e. Spirulina

551. Examination of a child revealed enlarged abdomen, curved legs, increased excitability of the nervous system, and increased excretion of phosphates with the urine. Deficiency of what food component can cause such clinical changes?

- a. Vitamin C
- b. Vitamin K
- c. Vitamin D**
- d. Vitamin F
- e. Vitamin A

552. HIV-infection occupational risk groups include people of various professions, healthcare workers included. Specify the most likely route of infection transmission for healthcare workers:

- a. Transmission via airborne dust particles
- b. Vector-borne transmission
- c. Droplet transmission
- d. Parenteral transmission**
- e. Fecal-oral transmission

553. A starch molecule contains residues of a certain monosaccharide. Name this monosaccharide.

- a. D-fructose
- b. D-galactose
- c. D-mannose
- d. D-glucose**
- e. D-ribose

554. Moisture content of thermally unstable preparations can be determined by:

- a. Permanganatometry
- b. Bromatometry
- c. Iodometry
- d. Nitritometry
- e. Karl Fischer titration**

555. Which compound has the most markedly expressed basic properties?

- a.  $\text{CH}_3\text{COOH}$
- b.  $\text{CH}_3\text{CH}_2\text{NH}_2$**
- c.  $\text{CH}_3\text{CH}_2\text{OH}$
- d.  $\text{CH}_3\text{CH}_2\text{CH}_3$
- e.  $\text{CH}_3\text{CH}_2\text{SH}$

556. What is the main substrate for eicosanoid synthesis in the human body?

- a. Oleic acid
- b. Stearic acid
- c. Arachidonic acid**
- d. Caproic acid
- e. Palmitic acid

557. What analytical effect is observed during fixation of the end point in the Volhard titration?

- a. The solution colors yellow
- b. The solution colors red**
- c. A brown precipitate is produced

- d. A red precipitate is produced
- e. A yellow precipitate is produced

558. A 5-year-old boy has stomachache, diarrhea with mucus and blood admixtures in the stool, and a fever of  $38.0^{\circ}\text{C}$ . Bacteriological stool test detected *Shigella flexneri*. What disease is it?

- a. Yersiniosis
- b. Typhoid fever

**c. Dysentery**

- d. Nonspecific ulcerative colitis
- e. Salmonellosis

559. A 25-year-old-patient with the II degree thermal burns came to the doctor. Objectively: there are large blisters on the upper limbs; the blisters are filled with clear exudate consisting mostly of water and albumines with isolated leukocytes. Name this type of exudate:

**a. Serous**

- b. Fibrinous
- c. Catarrhal (mucous)
- d. Purulent
- e. Hemorrhagic

560. What device is used to measure surface tension of a liquid?

- a. Viscometer
- b. Calorimeter

**c. Stalagmometer**

- d. Areometer
- e. Nephelometer

561. *Datura stramonium* fruit is a:

- a. Pseudomonocarpous drupe
- b. Legume with two seeds

**c. Spiny capsule**

- d. Silicular capsule
- e. Trihedral nutlet

562. In pharmacy, extraction is used to extract bioactive substances from herbal raw materials. What law underlies this process?

- a. Law of mass action

**b. Distribution law**

- c. Konovalov's law
- d. Poiseuille's law
- e. Ostwald's law

563. Chemical equilibrium theory allows predicting the approaches that result in the maximum yield of medicines. What factor has no effect on the chemical equilibrium shift?

- a. A change in the concentration of the initial substances
- b. Pressure change
- c. Temperature change

**d. Addition of a catalyst**

- e. A change in the concentration of products

564. A 55-year-old man suffers from peptic ulcer disease of the stomach. What can be identified as an aggressive factor in this case?

- a. Regeneration of the gastric mucosal epithelium
- b. Prostaglandin E

**c. *Helicobacter pylori***

- d. Adequate blood supply to the gastric mucosa
- e. Intestinal mucosal barrier

565. A pharmacy has decided to use a biological method for quality control of instrument sterilization

in an autoclave. What microorganisms optimally should be used for this purpose?

- a. **Bacillus subtilis**
- b. Salmonella typhi
- c. Yersinia pestis
- d. Borrelia recurrentis
- e. Streptococcus pyogenes

566. After accidentally eating inedible mushrooms, a woman presents with disturbed consciousness, anuria, arterial hypotension, and hyperazotemia. What pathological condition can be characterized by these symptoms?

- a. **Acute renal failure**
- b. Acute pyelonephritis
- c. Acute diffuse glomerulonephritis
- d. Chronic renal failure
- e. Urolithiasis

567. Serum total protein is one of metabolic indicators. What reaction is usually used in clinical laboratories to measure this value?

- a. Xanthoproteic
- b. Fohl
- c. **Biuret**
- d. Ninhydrin
- e. Nitroprusside

568. A patient with bronchial asthma had been prescribed salbutamol, which led to disappearance of bronchospasm symptoms. It happened due to stimulation of:

- a. beta\_1-adrenoreceptors
- b. Muscarinic acetylcholine receptors
- c. alpha\_1-adrenoreceptors
- d. Acetylcholine synthesis
- e. **beta\_2-adrenoreceptors**

569. Silver nitrate solution has been added to the solution containing anions of the first analytical group. It resulted in yellow precipitate. That means the following are present in the solution:

- a. Bromide ions
- b. **Arsenite ions**
- c. Sulphate ions
- d. Iodide ions
- e. Arsenate ions

570. What mucolytic agent would you recommend for the patient with acute bronchitis to facilitate expectoration?

- a. Hydrocodone
- b. Glaucine
- c. Codeine
- d. **Acetylcysteine**
- e. Libexin (Prenoxdiazine)

571. Specify what method of redox titration requires the use of specific indicator - starch - to fix the end point:

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

572. A patient with a malignant tumor suffers from significant weight loss and exhaustion, caused by a certain substance that inhibits the hunger center and stimulates catabolism. Name this substance.

- a. Aldosterone

- b. Insulin
- c. Glucagon
- d. Cachexin**
- e. Somatotropin

573. Alkaptonuria is caused by a hereditary disorder of the metabolism of a certain amino acid. Name this amino acid.

- a. Tryptophan
- b. Alanine
- c. Arginine
- d. Phenol
- e. Tyrosine**

574. A man with signs of glomerulonephritis came to a hospital. What pathological components in his urine indicate the increased permeability of the glomerular membrane?

- a. Pus
- b. Protein**
- c. Glucose
- d. Acetone
- e. Bilirubin

575. A patient developed an atrioventricular block. What drug is indicated in this case?

- a. Atropine**
- b. Pirenzepine
- c. Clophelin (Clonidine)
- d. Anaprilin (Propranolol)
- e. Metoprolol

576. Certain amino acids decarboxylate in large intestine producing toxic substances. What compound is produced from ornithine?

- a. Arginine
- b. Phenol
- c. Indole
- d. Putrescine**
- e. Lysine

577. What nutrient medium is used for obtaining a fungal culture?

- a. Endo medium
- b. Ploskirev medium
- c. Sabouraud medium**
- d. Kitt-Tarozzi medium
- e. Casein-carbon agar

578. A narcological department has received a man diagnosed with morphinism. The doctor notes decreased pharmacological activity of morphine. Name the phenomenon, when drug effectiveness is decreased after its repeated administration:

- a. Antagonism
- b. Tolerance**
- c. Material cumulation
- d. Functional cumulation
- e. Summation

579. A patient who was receiving an indirect anticoagulant, warfarin, has taken acetylsalicylic acid to treat elevated body temperature. This combination of drugs is dangerous due to increased risk of:

- a. Cardiotoxicity
- b. Neurotoxicity
- c. Dysbiosis
- d. Hemorrhage**
- e. Osteoporosis

580. An elderly patient has developed postoperative intestinal atony. What anticholinesterase drug should be prescribed?

- a. Pilocarpine hydrochloride
- b. Proserin**
- c. Metoprolol
- d. Dithylinum (Suxamethonium chloride)
- e. Atropine sulfate

581. Morphologically the herbaceous plant being studied can be identified as *Convallaria majalis*. To confirm this conclusion additionally, a leaf of this plant was examined under the microscope and a search for the following crystalline inclusions was conducted:

- a. Single crystals
- b. Druse crystals
- c. Styloid crystals
- d. Crystal sand
- e. Raphides**

582. What drug is administered in case of uterine inertia?

- a. Oxytocin**
- b. Fenoterol
- c. No-spa
- d. Vikasolum
- e. Progesterone

583. The leaves of a Lamiaceae family plant are ovate, with a pointed tip, crenate leaf edge, and a lemon scent, which is characteristic of the following plant:

- a. Melissa officinalis**
- b. Leonurus cardiaca
- c. Mentha piperita
- d. Lamium album
- e. Salvia officinalis

584. A patient has developed an allergic skin reaction in the form of urticaria after using an antibiotic to treat pneumonia. What antihistamine is indicated in this case?

- a. Loratadine**
- b. Tannin
- c. Raunatine (Rauwolfia alkaloids)
- d. Prednisolone
- e. Ranitidine

585. What method of redox titration uses specific pH indicators for fixation of the titration endpoint?

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

586. A 5-year-old child presents with abdominal distension, abdominal cramps, and diarrhea occurring 1-4 hours after drinking milk. Described symptoms are caused by the lack of enzymes that break up:

- a. Sucrose
- b. Glucose
- c. Maltose
- d. Lactose**
- e. Fructose

587. A female patient asked a pharmacist to recommend her a drug for headache with antiplatelet effect. Specify this drug:

- a. Acetylsalicylic acid**
- b. Promedol

- c. Codeine phosphate
- d. Tramadol
- e. Fentanyl

588. A patient has been hospitalized with the provisional diagnosis of gas gangrene, caused by spore-forming anaerobes. What nutrient medium must be used for inoculation of the material, obtained from the patient, to isolate a pure culture and confirm the diagnosis?

- a. Endo medium
- b. Levin medium
- c. Kitt-Tarozzi medium
- d. Egg yolk-salt agar
- e. Meat-peptone agar, meat-peptone broth

589. When a mixture of electrolytes is added into a sol, one of them reduces the effect of another. Name this phenomenon:

- a. Phoresis
- b. Rheopexy
- c. Additivity
- d. Synergism
- e. Antagonism

590. A herbaceous plant of Malvaceae famiy has expectorant and coating properties. The plant has pale pink flowers gathered into apical panicles and schizocarpous fruit, which means it belongs to the following species:

- a. *Thymus serpyllum*
- b. *Plantago psyllium*
- c. *Plantago major*
- d. *Tussilago farfara*
- e. *Althaea officinalis*

591. Coagulation of sols under the effect of electrolytes can be determined by a general rule. Name this rule.

- a. Schulze-Hardy rule
- b. Gibbs rule
- c. Arrhenius law
- d. Duclos-Traube rule
- e. Van't Hoff rule

592. Gravimetry was used to analyze sodium sulfate crystalline hydrate by precipitating sulfate ions with a barium chloride solution. After its maturation, the barium sulfate precipitate must be washed using decantation. What is used as a washing liquid for this purpose?

- a. Dilute solution of sulfuric acid
- b. Barium chloride solution
- c. Ammonium sulfate solution
- d. Distilled water
- e. Sodium sulfate solution

593. An engine driver complains of his seasonal allergy symptoms. What non-sedating drug should be prescribed in this case?

- a. Novocaine
- b. Analgine (Metamizole)
- c. Loratadine
- d. Fenofibrate
- e. Atenolol

594. The fruit is a spiky spherical green capsule. The capsule splits open into two valves and contains usually one large glossy dark brown seed with a matt whitish scar. It is a fruit of:

- a. *Hipericum perforatum*
- b. *Aesculus hippocastanum*

- c. *Plantago major*
- d. *Papaver somniferum*
- e. *Datura stramonium*

595. A stool sample obtained from a patient with suspected shigellosis was inoculated on the Ploskirev nutrient medium. What will be the color of the colonies of the dysentery pathogen in this medium?

- a. Blue-violet
- b. Red with a metallic sheen
- c. Dark brown
- d. Colorless
- e. Yellow

596. What anticholinesterase agent is used to stimulate intestinal peristalsis in the patients during the postoperative period?

- a. Dithylin (Suxamethonium)
- b. Adrenaline hydrochloride
- c. Prozerin (Neostigmine)
- d. Salbutamol
- e. Metoprolol

597. Potentiometric methods of analysis are based on the use of:

- a. Dependence of the volume of the titrant on the concentration of the analyte
- b. Dependence of the volume of the produced gas on the concentration of the analyte
- c. Dependence of the electric current on the concentration of the analyte
- d. Dependence of the electromotive force (EMF) of a galvanic cell on the concentration of the analyte
- e. Dependence of the mass of the precipitate on the concentration of the analyte

598. Formation enthalpy equals zero for the following substance:

- a.  $\text{CaCO}_3$
- b.  $\text{O}_2$
- c.  $\text{H}_2\text{SO}_4$
- d.  $\text{H}_2\text{O}_2$
- e.  $\text{CO}_2$

599. A plant has roots with bacteriorhiza, complex leaves with stipules, flowers with a papilionaceous corolla, and a silique fruit. These features are characteristic of the following family:

- a. Lamiaceae
- b. Asteraceae
- c. Fabaceae
- d. Apiaceae
- e. Solanaceae

600. If addition of an alkali solution and heating provokes the release of ammonia in an analyzed solution, it indicates that the analyzed solution contains the following ions:

- a.  $\text{K}^+$
- b.  $\text{NO}_2^-$
- c.  $\text{NH}_4^+$
- d.  $\text{NO}_3^-$
- e.  $\text{Na}^+$

601. If the amount of a high molecular substance added into a sol is very small, then a decrease in its stability, instead of an increase, can occur. What is the name of this phenomenon?

- a. Solubilization
- b. Sensitization
- c. Syneresis
- d. Synergism
- e. Sedimentation

602. What enzyme catalyzes the reaction of activation of amino acids and their attachment to a specific tRNA?

- a. Ribonuclease
- b. Deoxyribonuclease
- c. Nucleotidase
- d. DNA ligase
- e. Aminoacyl-tRNA synthetase**

603. Amino acids and their derivatives function as neurotransmitters in brain neurons. What neurotransmitter forms from an aromatic amino acid?

- a. Taurine
- b. Leucine
- c. Glycine
- d. Dopamine**
- e. Methionine

604. Which of the drugs listed below quickly arrests angina pectoris attack when taken sublingually?

- a. Nitroglycerine**
- b. Lisinopril
- c. Convallariae glycoside
- d. Amiodarone
- e. Digoxin

605. On the surface of a crystalline substance predominantly those ions are adsorbed that compose the crystalline lattice or are isomorphous to its ions, forming in the process a hard-to-dissolve compound with crystalline ions. Name the author (authors) of this rule:

- a. Paneth, Fajans**
- b. Rehbinder
- c. Schulze, Hardy
- d. Duclaux, Traube
- e. Van 't Hoff

606. The breakdown of starch in the body is a catalytic process that occurs with the help of amylase. What type of catalysis is it?

- a. Enzymatic catalysis**
- b. Heterogeneous catalysis
- c. Acid-base catalysis
- d. Redox catalysis
- e. Autocatalysis

607. What method can be used to determine the moisture content in thermally unstable preparations?

- a. Nitritometric method
- b. Non-aqueous titration using the Fischer's method**
- c. Bromatometric method
- d. Permanganatometric method
- e. Iodometric method

608. Microorganisms in the environment are being affected by various physical factors. What is the effect of high temperature on a microbial cell?

- a. Mutagenic effect
- b. Irreversible degradation of all cellular structures**
- c. Fats saponification
- d. Albuminolysis
- e. Transition into anabiosis state

609. A woman with essential hypertension developed a dry hacking cough as a result of taking angiotensin-converting enzyme inhibitors. What drugs that inhibit the renin-angiotensin system should be prescribed in this case?

- a. Sympatholytics
- b. Calcium channel blockers
- c. Diuretics
- d. Beta-blockers

**e. Angiotensin II receptor antagonists**

610. A patient with a hypertensive crisis was administered magnesium sulfate, which resulted in a sharp drop of the patient's blood pressure. What drug can be used in this case to eliminate the side effects of magnesium sulfate?

- a. Calcium chloride**
- b. Sodium bromide
- c. Trilon B (EDTA disodium salt)
- d. Potassium chloride
- e. Sodium sulfate

611. Electrolytic dissociation is one of the quantitative characteristics of electrolytes. What is used to determine the degree of electrolytic dissociation?

- a. The ratio of the number of dissociated molecules to the total number of solute molecules**
- b. The product of the number of dissociated and non-dissociated solute molecules
- c. The ratio of the number of non-dissociated solute molecules to the total number of ions
- d. The ratio of the number of non-dissociated molecules to the number of dissociated solute molecules
- e. The ratio of the solution concentration to the total number of dissociated solute molecules

612. A doctor prescribed nitrazepam to a patient complaining of insomnia. This drug has a hypnotic effect, because it interacts with certain receptors. Name these receptors.

- a. Serotonin receptors
- b. Adrenoceptors
- c. Histamine receptors
- d. Cholinergic receptors

**e. Benzodiazepine receptors**

613. What method is used for the quantification of magnesium sulfate solution for injections?

- a. Nitritometry
- b. Acid-base titration
- c. Complexonometry**
- d. Iodine monochloride titration
- e. Cerimetry

614. Tissue respiration is accompanied by formation of carbon dioxide and water. What component of the mitochondrial respiratory chain ensures the reduction of oxygen and formation of water?

- a. ATP / ADP translocase
- b. Ubiquinone
- c. Acylcarnitine transferase
- d. Cytochrome C

**e. Cytochrome oxidase**

615. During practical field session students have detected plant with diversity of leaves that differ by their placement on stem, parts development, size, shape, lamina division. This phenomenon is called:

- a. Venation
- b. Heterophylly**
- c. Metamorphosis
- d. Leaf mosaic
- e. Phyllotaxy

616. A patient with mushroom poisoning has developed the following symptoms: yellow coloring of skin and sclera, dark-coloured urine. Hemolytic jaundice was diagnosed. What pigment causes such colouring of the patient's urine?

- a. Unconjugated bilirubin**

b. Conjugated bilirubin

**c. Stercobilin**

d. Biliverdin

e. Verdohemoglobin

617. Flowers with cruciform (cross-shaped) flower-cup and corolla, tetradynamous androecium, pod and silicle seeds are characteristic of the following family:

a. Papaveraceae

b. Rosaceae

c. Ranunculaceae

d. Asteraceae

**e. Brassicaceae**

618. A patient who had been suffering from peptic ulcer disease of the stomach for a long time has cachexia, pallor, weakness, loss of appetite, and aversion to meat products. Biopsy of the gastric mucosa detected cellular anaplasia. What pathology can be characterized by such symptoms?

a. Hypertrophic gastritis

b. Benign gastric tumor

c. Gastric polyposis

**d. Malignant gastric tumor**

e. Ulcer penetration

619. A melliferous tree has heart-shaped leaves and dichasial cyme inflorescences with winged perianth. This plant is:

a. Aesculus hippocastanus

**b. Tilia cordata**

c. Aronia melanocarpa

d. Robinia pseudoacacia

e. Quercus robur

620. A 2M solution of HCl was added into the studied solution, resulting in formation of a white precipitate that dissolved when heated. What cations are present in the solution?

a.  $\text{Ag}^+$

**b.  $\text{Pb}^{2+}$**

c.  $\text{Ba}^{2+}$

d.  $\text{Mg}^{2+}$

e.  $\text{Hg}^{22+}$

621. Separation of substances in chromatography is based on the ability of solutes:

a. To precipitate

b. To distribute between two mobile phases

c. To distribute between two stationary phases

d. To dissolve

**e. To distribute between the mobile and stationary phases**

622. A pharmacy needs to sterilize a liquid dosage form by means of a mechanical sterilization method. What device should be used for this purpose?

a. Autoclave

**b. Seitz filter**

c. Pasteur oven

d. Koch apparatus

e. Steam sterilizer

623. What pathologies facilitate cumulation of drugs?

a. Diseases of locomotor apparatus

b. Diseases of connective tissue

c. Diseases of respiratory tracts

**d. Diseases of liver and kidneys**

e. Diseases of CNS

624. Metal ions in the blood are transported in a complex with proteins. What blood protein contains copper?

- a. Fibrinogen
- b. Thrombin
- c. Fibrinolysin
- d. Ceruloplasmin**
- e. Albumin

625. A patient has been receiving Theophylline (inhibitor of cyclic adenosine monophosphate phosphodiesterase) for a week. What hormone can increase its action due to such treatment and cause hyperglycemia as the result?

- a. Estradiol
- b. Glucagon**
- c. Testosterone
- d. Aldosterone
- e. Insulin

626. To quantitatively determine  $\text{Fe}^{3+}$  ions, a photometric reaction with sulfosalicylic acid was conducted. Photometric determination of the obtained solution requires measuring of the following:

- a. Specific rotation
- b. Optical density**
- c. Half-wave potential
- d. Wavelength
- e. Refractive index

627. An HIV-infected patient presents with suppression of the immune system activity. What cells are affected in this case, causing the state of immunodeficiency in the patient?

- a. B lymphocytes
- b. Helper T cells**
- c. Macrophages
- d. Killer T cells
- e. Suppressor T cells

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

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

629. A colloidal solution emits a matte glow, when light passes through it, due to the light scattering on the colloidal particles as a result of diffraction. Name this physical phenomenon:

- a. Sedimentation
- b. Opalescence**
- c. Coagulation
- d. Syneresis
- e. Intramolecular diffraction

630. Hydrolytic destruction of compounds is carried out by a certain class of enzymes - hydrolases. What compounds are being hydrolyzed with proteases?

- a. Carbon dioxide
- b. Proteins**
- c. Pyruvic acid
- d. Higher fatty acids
- e. Glucose

631. A patient with high risk of hemorrhages is recommended to take vicasol (menadione) by his physician. This drug is the structural analog of:

- a. Vitamin K**

- b. Vitamin A
- c. Vitamin B<sub>5</sub>
- d. Vitamin B<sub>6</sub>
- e. Vitamin B<sub>12</sub>

632. A patient has been diagnosed with bronchial asthma. Specify the drug that can be administered for asphyxiation:

- a. Anapriline
- b. Paracetamol
- c. Diclofenac sodium
- d. Acetylcysteine
- e. Salbutamol**

633. For the specific prevention of influenza, the employees of an enterprise were vaccinated with "Influvac". What type of immunity will develop in the body of the vaccinated?

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

634. A 77-year-old man complains of shortness of breath, leg edemas, and cardiac pain. He suffers from chronic heart failure. What type of hypoxia is observed in this man?

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

635. On a fusibility curve of a two-component system with simple eutectic we can observe the following above the liquidus line:

- a. Each component is partially in different aggregate states
- b. Both components are in gaseous state
- c. One component is liquid, another is solid
- d. Both components are in solid state
- e. Both components are in liquid state**

636. Microscopy of an axial organ shows that between the secondary phloem and xylem there is a layer of live, thin-walled, tightly packed, slightly elongated cells. What structure is formed by these cells?

- a. Cambium**
- b. Periderm
- c. Pericycle
- d. Procambium
- e. Phellogen

637. Name the method of binding foreign ions in an analysis:

- a. Analytical concentration
- b. Analytical extraction
- c. Analytical separation
- d. Analytical masking**
- e. Analytical coprecipitation

638. A 55-year-old man came to a doctor with complaints of acute pain in his big toes. Meat and wine are a permanent fixture in his diet. The doctor suspects gout. What substance must be measured in the patient's blood to confirm this diagnosis?

- a. Ketone bodies
- b. Urea
- c. Uric acid**

- d. Bilirubin
- e. Lactate

639. Which alkadiene of those listed below is a diene with cumulated double bonds?

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

640. Dopplerography detected bilateral stenosis of renal arteries in a patient with the blood pressure of 180/100 mm Hg. Activation of what system is the most likely cause of the persistently elevated blood pressure in this case?

- a. Sympathoadrenal system
- b. Kinin-kallikrein system
- c. Central nervous system
- d. Renin-angiotensin-aldosterone system
- e. Hypothalamic-pituitary-adrenal axis

641. An injured person exhibits the following signs at the site of trauma: skin redness, throbbing small arteries, elevated local temperature, increased tissue turgor. What local blood circulation disorder are these presentations typical of?

- a. Embolism
- b. Arterial hyperemia
- c. Ischemia
- d. Thrombosis
- e. Venous hyperemia

642. What is the main mechanism of benzylpenicillin bactericidal action on the coccal flora?

- a. Inhibition of protein synthesis
- b. Activation of macroorganism immune system
- c. Disturbed synthesis of microbial cell wall
- d. Disturbed cytoplasmic membrane permeability
- e. Increased phagocytic activity of leukocytes

643. Ammonia is a highly toxic substance, especially for the nervous system. This toxic product binds with a certain metabolite of the tricarboxylic acid cycle, forming glutamate and glutamine. What metabolite is it?

- a. Fumarate
- b. Succinate
- c. Alpha-ketoglutarate
- d. Malate
- e. Citrate

644. Velamen is a specific multilayer absorbent tissue that often is photosynthetic. It provides protection against mechanical damage and water loss. It is formed on the roots of the following type of plants:

- a. Hydrophytes
- b. Mesophytes
- c. Xerophytes
- d. Epiphytes
- e. Hygrophytes

645. To introduce a medicine into the body through the airways, the following type of substance must be used:

- a. Emulsion
- b. Aerosol
- c. Ointment
- d. Suspension

e. Foam

646. Catabolism of body's own tissue proteins is intensified during such diseases as thyrotoxicosis and tuberculosis. This process is attended by a certain compound been intensively synthesized in liver and subsequently excreted with urine. Name this compound:

a. Acetone bodies

b. Fatty acids

**c. Urea**

d. Glucose

e. Nucleotides

647. An enzyme transports structure fragments from one substrate into another. Name this class of enzymes:

**a. Transferases**

b. Hydrolases

c. Ligases

d. Isomerases

e. Oxidoreductases

648. Neutralization of xenobiotics and active endogenous metabolites often occurs via inclusion of an oxygen atom into a substrate molecule as the result of the following process:

a. Deaminization

**b. Hydroxylation**

c. Decarboxylation

d. Transamination

e. Phosphorilation

649. Drafting of analytical normative documents requires skills in macro- and microscopical analysis of plant organs. If a microslide mount shows clearly visible multilayered palisade (columnar) parenchyma, it is characteristic of:

a. Fern rhizomes

b. Stems of dicotyledons

c. Roots

d. Adventitious roots

**e. Leaves**

650. Proteins are of great importance for vital functions. What value of pH results in zero electrophoretic mobility of gelatin (gelatin isoelectric point equals 4.7)?

a. 5.5

**b. 4.7**

c. 14.0

d. 9.4

e. 7.0

651. A patient with a cranial trauma has regularly recurring epileptiform seizures. In this case, disturbed metabolism of a certain biogenic amine can be observed. Name this biogenic amine.

a. Indole

**b. GABA**

c. Putrescine

d. Cadaverine

e. Adrenaline

652. Polymerase chain reaction (PCR) is widely used in modern laboratory diagnostics. What can be detected using this reaction?

a. Allergy to the pathogen

b. Antigen of the microorganism

c. Antibodies to the microorganism

**d. Nucleic acid of the microorganism**

e. Autoimmune disease

653. A pregnant woman was administered fenoterol to reduce the uterine tone for the correction of her labor activity. What is the mechanism of the uterolytic effect of this drug?

- a. Direct antispasmodic effect
- b. Blocking beta<sub>2</sub>-adrenoceptors of the uterus
- c. Stimulation of beta<sub>2</sub>- and alpha<sub>1</sub>-adrenoceptors of the uterus
- d. Stimulation of alpha<sub>1</sub>-adrenoceptors of the uterus
- e. Stimulation of beta<sub>2</sub>-adrenoceptors of the uterus**

654. The patient's diuresis decreased to 800 mL per 24 hours. Such change in urine output is called:

- a. Anuria
- b. Polyuria
- c. Leukocyturia
- d. Proteinuria
- e. Oliguria**

655. When determining substances by means of mercurimetric titration, the following solution is used as a titrant:

- a. Silver(I) nitrate
- b. Ammonium thiocyanate
- c. Mercury(II) nitrate**
- d. Mercury(I) nitrate
- e. Potassium iodide

656. A 60-year-old man with heart failure has received a cardiotonic that is a beta<sub>1</sub> adrenergic agonist. Name this drug:

- a. Dobutamine**
- b. Papaverine
- c. Xenical (Orlistat)
- d. Potassium aspartate and magnesium aspartate
- e. Salbutamol

657. In permanganatometry, KMnO<sub>4</sub> is used as a titrant. What is the equivalence factor of this compound, if the titration is performed in an acidic medium?

- a. 1/2
- b. 1/5**
- c. 1/3
- d. 1/4
- e. 1

658. Each stem node of white deadnettle (*Lamium album*) has two leaves that grow perpendicularly to the leaves of the previous node. Such leaf arrangement is called:

- a. Leaf mosaic
- b. Cross-opposite**
- c. Rosette
- d. Spiral
- e. Verticillate

659. The pharmacy of a tuberculosis clinic has received tuberculin. What is the purpose of this substance?

- a. Allergic diagnostics of tuberculosis**
- b. Phagotyping of mycobacteria
- c. Serological diagnostics of tuberculosis
- d. Specific therapy of tuberculosis
- e. Specific prevention of tuberculosis

660. Autopsy of a lab rat that for the period of 24 hours remained in an immobilization chamber revealed gastric erosions. What hormones can cause erosions in this case?

- a. Glucagon
- b. Insulin

**c. Glucocorticoids**

d. Estrogens

e. Mineralocorticoids

661. According to the Rayleigh equation, the intensity of scattered light is inversely proportional to the wavelength of:

a. Incident light (fifth power)

b. Incident light

**c. Incident light (fourth power)**

d. Incident light (second power)

e. Incident light (third power)

662. Trimerization of acetylene results in the following product:

a. Cyclooctatetraene

b. 2-Butyne

**c. Benzene (benzol)**

d. Vinylacetylene

e. Trimethylbenzene

663. A patient has pulmonary edema. What drug must be prescribed in this case to reduce the volume of circulating blood?

a. Metoprolol

**b. Furosemide**

c. Magnesium sulfate

d. Aminazine (Chlorpromazine)

e. Nitroglycerin

664. A Poaceae plant has linear leaves with several non-branching veins that are parallel to the edge of the lamina, which indicates the following type of leaf venation:

a. Pinnate

**b. Parallel**

c. Palmate

d. Arcuate

e. Dichotomous

665. A man with gout has a significant increase in blood levels of uric acid. Uric acid is an end product of the metabolism of:

a. Fatty acids

b. Triglycerides

c. Albumins

d. Globulins

**e. Purine bases**

666. What non-steroidal anti-inflammatory drugs selectively block COX-2?

**a. Meloxicam, Nimesulide**

b. Mefenamic acid, Naproxen

c. Indomethacin, Diclofenac sodium

d. Ortophen, Voltaren

e. Ibuprofen, Ketoprofen

667. A 55-year-old patient was diagnosed with angina pectoris. A calcium channels blocking agent was prescribed for the treatment. Name this drug:

a. Labetalol

**b. Amlodipine**

c. Atenolol

d. Octadinum (Guanethidine)

e. Reserpine

668. A patient with a joint disorder was prescribed an ointment that contains as its active substance a

certain glycosaminoglycan that is the most important component of cartilage. Name this glycosaminoglycan:

- a. Heparin
- b. Chondroitin sulfate**
- c. Arabinose
- d. Starch
- e. Glycogen

669. At what temperature should the determination be carried out in refractometric method of analysis?

- a.  $18^{\circ}\text{C}$
- b.  $20^{\circ}\text{C}$**
- c.  $23^{\circ}\text{C}$
- d.  $25^{\circ}\text{C}$
- e.  $28^{\circ}\text{C}$

670. A patient has a gallstone lodged in the common bile duct, which blocks bile supply to the intestine. What digestive process will be disturbed in this case?

- a. Protein absorption
- b. Protein digestion
- c. Carbohydrate digestion
- d. Carbohydrate absorption
- e. Fat digestion**

671. Potassium iodide solution has been added to the solution containing cations of the sixth analytical group (acid-base classification). It resulted in the red precipitate soluble in excess of reagent. What cations are present in the solution?

- a. Bismuth
- b. Nickel
- c. Cadmium
- d. Cobalt (II)
- e. Mercury (II)**

672. Treatment of withdrawal syndrome in cases of morphine discontinuation requires the use of a drug that is an opiate receptor antagonist. Select this drug from the list.

- a. Codeine phosphate
- b. Riboflavin
- c. Naloxone hydrochloride**
- d. Omnopon
- e. Ketorolac

673. Classification of anions is based on different solubility of their salts with  $\text{Ba}^{2+}$  and  $\text{Ag}^{+}$  ions. Anions of the 1st analytical group form salts poorly soluble in water with the following ions:

- a.  $\text{Ag}^{+}$  (ammonia buffer medium)
- b.  $\text{Ba}^{2+}$  (alkaline or neutral medium)**
- c.  $\text{Ag}^{+}$  (alkaline medium)
- d.  $\text{Ag}^{+}$  (neutral medium)
- e.  $\text{Ag}^{+}$  (acid medium)

674. A 33-year-old woman was admitted into a psychiatric hospital with an anxiety disorder of neurotic origin. What drug is indicated in this case?

- a. Levodopa
- b. Naloxone
- c. Droperidol
- d. Diazepam**
- e. Valerian extract

675. A 32-year-old man with suspected alkaloid poisoning was brought into the admission room of an emergency hospital. What should be used for gastric lavage in this case?

a. Potassium permanganate

b. Sodium chloride

c. Furacilin (Nitrofurantoin)

d. Magnesium sulfate

e. Unithiol (Dimercaptopropylsulfonate)

676. How according to the Pharmacopoeia is pH determined?

a. Conductometry

b. Indicator

c. Potentiometry

d. Polarography

e. Spectrophotometry

677. The Wasserman test was positive in a 25-year-old woman. What disease can be diagnosed using this test?

a. Tuberculosis

b. Brucellosis

c. Diphtheria

d. Syphilis

e. Leptospirosis

678. A 47-year-old patient with bilateral pneumonia has a disruption of acid-base balance - compensated gaseous acidosis. What is the most probable mechanism of compensatory adaptation that maintains the patient's acid-base balance?

a. Intensified acidogenesis in kidneys

b. Vomiting

c. Decreased reabsorption of hydrogen carbonate in kidneys

d. Pulmonary hyperventilation

e. Diarrhea

679. High-molecular substances can be isolated from the solution using electrolytes. Name this process.

a. Salting out

b. Aggregation

c. Swelling

d. Coagulation

e. Sedimentation

680. Ion-exchange adsorption is widely used for water softening and demineralization. Through what ionite columns should the water be passed for its demineralization?

a. Through the anionite in the ROH-form, and then through the cationite in the R<sub>2</sub>Ca-form

b. Through the cationite in the RH-form, and then through the anionite in the ROH-form

c. Through the anionite in the R<sub>2</sub>SO<sub>4</sub>-form, and then through the cationite in the ROH-form

d. Through the cationite in the RH-form, and then through the cationite in the RK-form

e. Through the cationite in the RK-form, and then through the anionite in the ROH-form

681. What product is formed during the Wagner reaction, when alkenes are being oxidized with potassium permanganate in an aqueous medium?

a. Carboxylic acid

b. Glycol

c. Ketone

d. Aldehyde

e. Epoxide

682. Koch's bacillus was detected in the sputum of the patient with pulmonary tuberculosis. In this patient tuberculosis bacillus assumes the following role:

a. Disease development condition

b. Risk factor of the disease

c. Causative agent of the disease

- d. Condition conducive to the disease development
- e. Condition hampering the disease development

683. A chemotherapeutic agent has bactericidal effect against streptococci, staphylococci, bacilli, and clostridia. According to its action spectrum this drug belongs to the following group:

- a. Broad spectrum antifungal agents
- b. Broad spectrum antibacterial agents**
- c. Antituberculous agents
- d. Antiviral agents
- e. Narrow spectrum antibacterial agents

684. A patient has developed anemia against the background of nonspecific ulcerative colitis. In the blood, there are hypochromia, micro- and anisocytosis, and poikilocytosis. What type of anemia can be suspected in this case?

- a. Aplastic
- b. B<sub>12</sub> and folate deficiency
- c. Hemolytic
- d. Sideroblastic
- e. Iron deficiency**

685. Select a Brassicaceae family plant that contains glycosides similar in action to those obtained from foxglove:

- a. *Arctostaphylos uva-ursi*
- b. *Erysimum canescens***
- c. *Polygonum aviculare*
- d. *Urtica dioica*
- e. *Primula officinalis*

686. "Protargol" and "collargol" colloidal silver preparations contain protein compounds besides their active substance. What is the function of proteins in these drugs?

- a. Increased shelf life
- b. Increased bactericidal effect of silver
- c. Improved drug technology
- d. Prevention of coagulation of the colloidal solution**
- e. Decreased side effects

687. Microscopy of a vaginal discharge detects round and oval Gram-positive cells that gemmate and form a pseudomycelium. What medicines must be recommended for treatment, if the diagnosis of candidiasis is confirmed?

- a. Clotrimazole, nystatin**
- b. Sulgin (sulfaguanidine), phthalazol (phthalylsulfathiazole)
- c. Penicillin, streptomycin
- d. Erythromycin, monomycin
- e. Tetracycline, oleandomycin

688. Microscopy of a leaf of a heliophyte plant detects several dense layers of elongated chlorophyll-containing cells that are located under the epidermis. These cells are oriented perpendicular to the surface of the leaf. What type of parenchyma is it?

- a. Spongy parenchyma
- b. Storage parenchyma
- c. Palisade parenchyma**
- d. Folded parenchyma
- e. Water-storage parenchyma

689. When hydrogen peroxide solution is administered to bleeding wounds, it is broken up by one of the blood enzymes. Point out this enzyme:

- a. Catalase**
- b. Aspartate aminotransferase
- c. Lactate dehydrogenase

- d. Monoamine oxidase
- e. Cytochrome oxidase

690. A patient was admitted to a hospital in a state of hypoglycemic coma. It occurs at the following level of blood glucose:

- a. 2,5 mmol/l or less
- b. 3,3 mmol/l
- c. 5,5 mmol/l
- d. 4,0 mmol/l
- e. 4,5 mmol/l

691. Ammonia is a toxic substance that is especially dangerous for the brain. In the human body, the main product of ammonia neutralization and excretion is urea. Name the process of urea synthesis.

- a. Linen cycle
- b. Citric acid cycle
- c. Krebs ornithine cycle
- d. Shemin-Rittenberg cycle
- e. Cori cycle

692. Symptoms of cardiac failure are detected during examination of a female patient. Specify the possible cause of myocardial failure among those named below:

- a. Primary hypertension
- b. Coarctation of aorta
- c. Pulmonary emphysema
- d. Mitral stenosis
- e. Infectious myocarditis

693. An oncological patient was prescribed fluorouracil that is a competitive inhibitor of thymidine synthase. It inhibits the process of:

- a. Lipids synthesis
- b. Purine nucleotides synthesis
- c. Pyrimidine nucleotides synthesis
- d. Carbohydrate disintegration
- e. Purine nucleotides disintegration

694. A 40-year-old patient has developed polyuria (10-12 liters per day) and polydipsia induced by damage to the hypothalamo-hypophyseal tract. What hormone deficiency causes such disorders?

- a. Oxytocin
- b. Vasopressin
- c. Somatotropin
- d. Corticotropin
- e. Thyrotropin

695. A 28-year-old patient has a subfebrile fever. This type of fever is observed when body temperature fluctuates within the following range:

- a. Over  $41^{\circ}\text{C}$
- b.  $36.6\text{--}37^{\circ}\text{C}$
- c.  $37\text{--}37.9^{\circ}\text{C}$
- d.  $38\text{--}39^{\circ}\text{C}$
- e.  $39\text{--}41^{\circ}\text{C}$

696. The brain is highly dependent on its supply with oxygen and energy substrates. Under physiological conditions, neurons utilize the following as an energy substrate:

- a. Higher fatty acids
- b. Glucose
- c. Amino acids
- d. Cholesterol
- e. Bilirubin

697. A patient complains of increased urine 24-hour volume and thirst. Laboratory analysis detects acetone and high levels of sugar in his urine. What hormone secretion is disturbed, leading to these changes?

- a. Vasopressin
- b. Insulin**
- c. Aldosterone
- d. Glucagon
- e. Testosterone

698. What potential forms at the interface between two solutions?

- a. Electrokinetic potential
- b. Contact potential
- c. Surface potential
- d. Diffusion potential**
- e. Electrode potential

699. What hormone changes glucose levels in the blood and is produced in the pancreas?

- a. Somatostatin
- b. Aldosterone
- c. Insulin**
- d. Testosterone
- e. Growth hormone

700. A child has been hospitalised with scalded skin syndrome. Staphylococcus aureus was detected in blisters. What virulence factor causes exfoliation and necrosis of epidermis?

- a. Hemolysin
- b. Hyaluronidase
- c. Enterotoxin
- d. Exfoliative toxin**
- e. Toxic shock syndrome toxin

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

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

702. In acidimetry, titrants are prepared using the method of determined titer. What substance is used for their standardization according to the State Pharmacopoeia of Ukraine?

- a. Sodium chloride
- b. Metallic iron
- c. Metallic zinc
- d. Sodium carbonate**
- e. Potassium chloride

703. What is the type of leaf attachment to the stem in Papaver somniferum?

- a. Perfoliate
- b. Ochreate
- c. Auriculate
- d. Clasping**
- e. Sheathing

704. A patient with food poisoning, accompanied by diarrhea and multiple episodes of vomiting, developed dehydration. What type of total blood volume disorder can be observed in this case?

- a. Normocythemich hypovolemia
- b. Polycythemich hypovolemia**
- c. Oligocythemich hypovolemia

- d. Oligocytemic hypervolemia
- e. Polycythemic hypervolemia

705. A poisonous weed of the Solanaceae family has branching downy stems. Its leaves are soft, dull, and dark green; on their lower surface they are light gray, with thicker and longer down along their veins and edges. The flowers are sessile, with a deciduous five-lobed funnelform corolla that is colored dirty yellow (rarely whitish) and has a network of purple-violet veins. The fruit is an urceolate capsule with an operculum. These features are characteristic of:

- a. *Datura innoxia*
- b. *Atropa belladonna*
- c. *Nicotiana tabacum*
- d. ***Hyoscyamus niger***
- e. *Datura stramonium*

706. Digestive enzymes produced in pancreas are inactive. What enzyme in intestines starts the transformation process of proenzymes into enzymes?

- a. **Enterokinase**
- b. Chymotrypsin
- c. Amylase
- d. Aminopeptidase
- e. Lactase

707. In order to bind hydrogen ions with tartaric acid during identification of potassium ions the following solution is used:

- a. Sodium hydroxide
- b. Sulfuric acid
- c. **Sodium acetate**
- d. Ammonia
- e. Hydrochloric acid

708. What solution can be used to determine the presence of chloride ions in the potable water?

- a. Ammonia
- b. Sodium hydroxide
- c. **Silver nitrate**
- d. Potassium bromate
- e. Iodine

709. Choose the indicator and titration method to determine hydrogen carbonate ions in a drug:

- a. **Methyl-orange, acidimetry**
- b. Phenolphthalein, alkalimetry
- c. Methyl-orange, alkalimetry
- d. Phenolphthalein, acidimetry
- e. Murexide, acidimetry

710. 1 minute after a patient had been administered penicillin the patient's arterial pressure sharply dropped, pulse became thready, cold sweating and clonic convulsions began. Name this condition:

- a. Burn shock
- b. Septic shock
- c. Traumatic shock
- d. Cardiogenic shock
- e. **Anaphylactic shock**

711. A patient, who was prescribed famotidine to treat peptic ulcer disease, came to the pharmacy. What is this drug's mechanism of action?

- a. H1-histamine receptor blockade
- b. Ganglionic receptor blockade
- c. Inhibition of hydrogen potassium ATPase
- d. Muscarinic receptor blockade
- e. **H2-histamine receptor blockade**

712. Oxygen cocktails are used in treatment of upper air passages. What kind of colloid system is it?

a. Aerosol

b. Paste

c. Suspension

d. Emulsion

e. Powder

713. During long-term carbon tetrachloride poisoning of animals significant activity drop of aminoacyl tRNA synthetase in hepatocytes was detected. What metabolic process is disrupted in this case?

a. Protein biosynthesis

b. Post-transcriptional modification of RNA

c. DNA replication

d. Post-translational modification of peptides

e. RNA transcription

714. In pharmaceutical production the oxyethylated derivatives of fatty acid esters (FAEs) are used, which undergo colloid dissolution in sufficiently concentrated solutions. This process is called:

a. Syneresis

b. Synergism

c. Colloid protection

d. Sensitization

e. Solubilization

715. What inflammatory mediator contributes to an increase in body temperature?

a. Interleukin-1

b. Thromboxane

c. Serotonin

d. Bradykinin

e. Histamine

716. Bioavailability of a powder depends on the degree of comminution of the substance. The following value must be measured:

a. Solution density

b. Particle mass

c. Particle volume

d. Dispersion

e. Concentration

717. A patient complains of low body temperature, weight gain, inertness, and drowsiness. T4 and T3 levels are decreased in his blood plasma. These signs are characteristic of the following pathology:

a. Myxedema

b. Diabetes mellitus

c. Albinism

d. Pellagra

e. Phenylketonuria

718. A patient in a state of psychosis was prescribed the following antipsychotic:

a. Caffeine

b. Aminazine (Chlorpromazine)

c. Cyclodol (Trihexyphenidyl)

d. Phenobarbital

e. Diazepam

719. In the process of systematic analysis of a cation mixture, iron(III) cations can be determined using the fractional method. What reagent is used for this purpose?

a. Potassium chloride

b. Potassium hexacyanoferrate(II)

c. Nitric acid

d. Hydrochloric acid

e. Sodium dihydrogen phosphate

720. In pharmaceutical technology, analysis of the phase diagram of systems is of practical importance. What type of equilibrium is characterized by the figurative point on the phase diagram of water?

- a. One-component, one-phase, non-variant
- b. One-component, three-phase, non-variant**
- c. Two-component, two-phase, one-variant
- d. One-component, two-phase, non-variant
- e. Two-component, one-phase, one-variant

721. Halogen atoms can be detected in an organic compound, if the following test is performed:

- a. Baeyer's test
- b. Molisch's test
- c. Beilstein's test**
- d. Lucas' test
- e. Iodoform test

722. A doctor prescribed metoprolol to a patient, which helped to lower the patient's blood pressure. This drug belongs to the following pharmacological group:

- a. Beta-blockers**
- b. Sympatholytics
- c. Muscarinic antagonists
- d. Nicotinic antagonists
- e. Alpha-blockers

723. One week after an inpatient treatment with penicillin, a microorganism that was initially susceptible to this antibiotic developed a resistance to penicillin, tetracyclines, aminoglycosides, and macrolides. What mechanism of antibiotic resistance formation is observed in this case?

- a. R-plasmid**
- b. Spontaneous
- c. Natural selection
- d. Mutational
- e. Phenotypic

724. Stone cells shaped like dumbbells or tubular bones were detected in begonia leaves. What type of cells do they belong to?

- a. Astrosclereids
- b. Osteosclereids**
- c. Macrosclereids
- d. Trichosclereids
- e. Fibrosclereids

725. A pure culture of movable vibrios was obtained from a patient diagnosed with cholera. What group of flagellates does this agent belong to?

- a. -
- b. Monotrichous**
- c. Lophotrichous
- d. Amphitrichous
- e. Peritrichous

726. A 33-year-old female patient, who undergoes long-term treatment due to chronic polyarthritis, complains of increased arterial pressure, adipose tissue redistribution and menstrual irregularities. What drug does the patient take?

- a. Indometacin
- b. Fluocinolone acetonide
- c. Prednisolone**
- d. Diclofenac sodium
- e. Phenylbutazone

727. Enzymes accelerate biochemical reactions by over  $10^8$  times. What equation describes the rate of enzymatic catalysis?

- a. Arrhenius equation
- b. Van't Hoff equation
- c. Law of mass action
- d. Van't Hoff isotherm equation

e. Michaelis-Menten equation

728. In the process of manufacturing live vaccines, the biofactories dry the bacteria and viruses in vacuum at low temperatures, to ensure stability and long shelf-life of the vaccines. Name this method:

a. Lyophilization

- b. Sublimation
- c. Tyndalization
- d. Sterilization
- e. Photoreactivation

729. Corolla of a zygomorphic bisexual flower consists of 5 petals: the largest one is called a banner, two lateral - wings, and two fused together - keel. This corolla is characteristic of Fabacea family and is called:

- a. Funnelform
- b. Lingulate
- c. Rotate

d. Papilionaceous

e. Tubular

730. A solution containing calcium and magnesium cations is titrated with Trilon B solution. Complexometric titration of these cations requires the following medium:

- a. Acetate buffer solution
- b. Acidic solution
- c. Neutral medium

d. Ammonium buffer solution

e. Formate buffer solution

731. A certain herbaceous plant grows on the meadows of the Carpathian Mountains. It has orange anthodium inflorescences, upright stem, and a rosette of basal leaves. Name this plant:

- a. Centaurea cyanus
- b. Cychorium intybus
- c. Calendula officinalis

d. Arnica montana

e. Echinacea purpurea

732. A patient presents with temperature  $38.5-39.5^{\circ}\text{C}$ , nausea, vomiting, and stomachache. Poisoning with salts of heavy metals is diagnosed. What drug should be prescribed as an antidote in this case?

- a. Phenolphthalein
- b. Validol (Menthyl isovalerate)

c. Unithiol

- d. Pentazocine
- e. Bromhexine

733. What reagent will allow for unsaturated organic compounds reduction under the conditions given below?

a.  $\text{H}_2$ , Ni, t

b.  $\text{HNO}_3$ , p, t

c.  $\text{H}_2\text{O}$ ,  $\text{Hg}^{2+}$ ,  $\text{H}^+$

d. NaOH,  $\text{H}_2\text{O}$

e.  $\text{K}_2\text{Cr}_2\text{O}_7$ ,  $\text{H}^+$

734. Examination of the patient's oral cavity detects roseola rash, pustules, and papules on the mucosa of the soft palate. Microscopy of the smears prepared from the discharge and stained according to Romanowsky-Giemsa revealed pale pink wavy microorganisms. What microorganisms are the likely cause of this pathology?

- a. Meningococci
- b. Treponema pallidum**
- c. Staphylococci
- d. Candida fungi
- e. Streptococci

735. A 28-year-old man with peptic ulcer of the stomach was prescribed a drug that inhibits gastric juice secretion. Specify this drug:

- a. Omeprazole**
- b. Ethacrynic acid
- c. Lidocaine
- d. Duphalac (Lactulose)
- e. Fenofibrate

736. What parameter is determined during a blood test for erythrocyte sedimentation rate?

- a. Aggregate stability
- b. Coagulation threshold
- c. -
- d. Kinetic stability
- e. Sedimentation stability**

737. A diagnostic feature important for correct identification of pine species is the number of needles on the short shoots (brachyblasts). *Pinus sylvestris* has the following number of needles on its short shoots:

- a. 8
- b. 2**
- c. 3
- d. 5
- e. Many

738. When food products are thermally processed, the spatial structure of the proteins changes. This process is called:

- a. Hydration
- b. Denaturation**
- c. Dialysis
- d. Renaturation
- e. Salting out

739. A man has acute glomerulonephritis. Because of oliguria, water retention is observed in his body. What abnormality of the total blood volume is most likely to be detected in this patient?

- a. Oligocythemic normovolemia
- b. Simple hypervolemia
- c. Polycythemic hypervolemia
- d. Simple hypovolemia
- e. Oligocythemic hypervolemia**

740. Emulsions, ointments, pastes, etc., can be made by comminuting solids and liquids in a suitable medium. This process is called:

- a. Adhesion
- b. Condensation
- c. Sedimentation
- d. Coagulation
- e. Dispersion**

741. A patient has mucosal dryness and mesopic vision disorder. What vitamin deficiency causes

these symptoms?

- a. C
- b. D
- c. E
- d. P
- e. A**

742. How does the value of the critical micelle concentration in homologous series change with an increase in the molecular mass of the surfactant?

- a. Increases
- b. Remains unchanged
- c. Decreases**
- d. Reaches its maximum and then decreases
- e. Sharply increases

743. Bacteriology of the feces of a patient with an acute intestinal infection allowed isolating a culture of *Shigella sonnei*. What serological reaction was used to identify the isolated culture?

- a. Bacteriolysis
- b. Neutralization
- c. Complement binding
- d. Precipitation
- e. Agglutination**

744. What test is used for identification of uric acid and other compounds with purine nucleus?

- a. Murexide reaction**
- b. Copper mirror reaction
- c. Lucas reagent
- d. Silver mirror reaction
- e. Fehling reagent

745. Blood test of a patient, who had been taking non-steroidal anti-inflammatory drugs for a long time, detected a sharp decrease in the amount of neutrophilic granulocytes, basophils, and eosinophils against the background of leukopenia. What pathological condition has developed in the patient?

- a. Agranulocytosis**
- b. Aleukia
- c. Anemia
- d. Leukocytosis
- e. Leukemia

746. Vitamins and vitamin-like compounds are required for activation of higher fatty acids and their transport through the mitochondrial membrane. Name one such compound:

- a. Biotin
- b. Ubiquinone
- c. Thiamine
- d. Carnitine**
- e. Riboflavin

747. You are a hospital pharmacist. Consult the pediatrician, what group of antibiotics is contraindicated for children due to their effect on formation of the bone tissue:

- a. Aminoglycosides
- b. Penicillins
- c. Tetracyclines**
- d. Macrolides
- e. Glucocorticoids

748. Preliminary disinfection of air and working surfaces of the equipment was conducted in the operating room of the surgical inpatient unit. What method of sterilization would be the most advisable in this case?

- a. Flowing steam
- b. Formaldehyde vapor
- c. Ultraviolet irradiation**
- d. Irradiation sterilization
- e. High-frequency current

749. 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 initiation
- c. Transcription termination
- d. Translation initiation**
- e. Translation termination

750. What disaccharide is a reducing one?

- a. Ribose
- b. Maltose**
- c. Starch
- d. Cellulose
- e. Sucrose

751. Aerosols are one of the dosage forms. Name the phenomenon when aerosol particles move in the direction of decreasing temperature.

- a. Thermophoresis**
- b. Peptization
- c. Photophoresis
- d. Electrophoresis
- e. Sedimentation

752. Solutions of high-molecular compounds can be precipitated by concentrated electrolyte solutions. Name this process:

- a. Coacervation
- b. Syneresis
- c. Peptization
- d. Coagulation
- e. Salting-out**

753. Dissociation degree in 0.01 M water solution is the same for all the strong electrolytes listed below. Name the substance with the highest boiling temperature:

- a.  $\text{Al}_2(\text{SO}_4)_3$**
- b.  $\text{K}_3\text{PO}_4$
- c.  $\text{Na}_3\text{PO}_4$
- d.  $\text{Cu}(\text{NO}_3)_2$
- e. KCl

754. A 36-year-old man has no hydrochloric acid or pepsin in his gastric juice. What is this condition called?

- a. Cholemia
- b. Achylia**
- c. Hyperchlorhydria
- d. Achlorhydria
- e. Hypochlorhydria

755. Friedel-Crafts alkylation takes place in the presence of catalysts - Lewis acids. What compounds are included in the list of Lewis acids?

- a. KOH, CaO
- b.  $\text{AlCl}_3$ ,  $\text{FeBr}_3$**
- c.  $\text{H}_2\text{O}$ ,  $\text{H}_2\text{O}_2$
- d.  $\text{KMnO}_4$ ,  $\text{Na}_2\text{S}_2\text{O}_3$

e. H<sub>2</sub>SO<sub>4</sub>, HNO<sub>3</sub>

756. What substance can enter into substitution and addition reactions?

- a. Ethanol
- b. Acetylene**
- c. Polypeptide
- d. Ethane
- e. Ethylene

757. The inflorescence of a plant has an elongated main axis and sessile flowers. What type of inflorescence is it?

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

758. A plant has laticifers with milky sap and single flowers with deciduous calyx lobes; the fruit is a capsule. Determine the family of this plant based on these diagnostic characters:

- a. Rosaceae
- b. Compositae
- c. Papaveraceae**
- d. Apiaceae
- e. Fabaceae

759. Human body assimilates fats only as emulsions. Vegetable oils and animal fats contained in food are emulsified when exposed to bile (an emulsifier). How does interface tension change in this case?

- a. Decreases**
- b. Remains unchanged
- c. Increases
- d. First increases, then decreases
- e. First decreases, then increases

760. Mercurimetry is used for quantification of halide ions in their interaction with solutions of mercury salts (Hg<sub>2</sub><sup>2+</sup>). What indicator allows analytical visualization of complete precipitation of halide ions?

- a. Eosin
- b. Fluorescein
- c. Methyl orange
- d. Diphenylcarbazone**
- e. Potassium dichromate

761. A specialist of the analytical laboratory performs direct iodometric determination of ascorbic acid. What indicator is used in this case?

- a. Phenolphthalein
- b. Starch**
- c. Methyl orange
- d. Diphenylamine
- e. Methyl red

762. Rapid analysis of benzoate ions by means of Pharmacopoeia reaction with iron(III) chloride produces:

- a. Blue precipitate
- b. Pink-yellow precipitate**
- c. Green precipitate
- d. Black precipitate
- e. Red precipitate

763. A 23-year-old patient has laryngeal diphtheria that manifests as classic clinical signs with the

development of true croup. What type of inflammation is characteristic of this disease?

- a. Croupous
- b. Serous
- c. Fibrinous**
- d. Purulent
- e. Putrid

764. In what taxonomic division is the gametophyte predominant over the sporophyte during the plant's life cycle?

- a. Pynophyta
- b. Bryophyta**
- c. Magnoliophyta
- d. Lycopodiophyta
- e. Polypodiophyta

765. A person was hospitalized into the infectious department with the body temperature of  $39^{\circ}\text{C}$ , headache, and chills. Spiral-shaped microorganisms stained violet according to the Romanowsky-Giemsa technique were detected in the thick blood smear. What microorganisms were detected in the patient?

- a. Actinomycetes
- b. Borrelia**
- c. Clostridia
- d. Leptospira
- e. Treponema

766. A doctor needs to prescribe the patient a drug for replacement therapy after thyreoidectomy. What drug would you recommend?

- a. Thiamazole
- b. Prednisolone
- c. Insulin
- d. L-thyroxine**
- e. Parathyroidin

767. What types of fruits are characteristic of the Ericaceae family plants?

- a. Cynarrhodium, compound drupe, fraga
- b. Legume, single follicle, single nutlet
- c. Hesperidium, silique, double-winged samara
- d. Achene, nutlet, drupe
- e. Capsule, drupe, berry**

768. A miner, who was trapped under a rock pile, developed crush syndrome and signs of hepatic coma. Hyperammonemia was detected in his blood. What process has caused the increase in the ammonia levels in the patient's blood?

- a. Bilirubin catabolism
- b. Deamination of amino acids**
- c. Glycolysis
- d. Gluconeogenesis
- e. Hydroxylation of amino acids

769. What two working solutions are used in determination of hydrogen sulfide in mineral waters by means of iodometry (back titration)?

- a.  $\text{Na}_2\text{CO}_3$ ,  $\text{HCl}$
- b.  $\text{I}_2$ ,  $\text{Na}_2\text{S}_2\text{O}_3$**
- c.  $\text{H}_2\text{C}_2\text{O}_4$ ,  $\text{KMnO}_4$
- d.  $\text{AgNO}_3$ ,  $\text{H}_2\text{SO}_4$
- e.  $\text{NaOH}$ ,  $\text{HCl}$

770. Hormones regulate numerous metabolic processes. What hormone activates glycogen synthesis?

- a. Vasopressin

- b. Oxytocin
- c. Adrenaline
- d. Insulin**
- e. Thyroxine

771. Blood contains erythrocytes with sizes of  $10^{-6}$  m degree as its constituent parts. What type of disperse system is blood?

- a. Homogeneous
- b. Coarse dispersion
- c. Heterogeneous
- d. Colloidal dispersion
- e. Microheterogeneous**

772. During furosemide therapy of a patient with chronic edematous syndrome, his plasma-cation concentration was disturbed. What drug should be used in this case?

- a. Ascorutin (Ascorbic acid + Rutoside)
- b. Aspirin
- c. Magne B<sub>6</sub>
- d. Potassium chloride**
- e. Thiamine bromide

773. What solution is used as a process solution (titrant) in alkalimetry?

- a. Ammonium hydroxide
- b. Potassium hydroxide**
- c. Sodium tetraborate
- d. Hydrochloric acid
- e. Oxalic acid

774. A child with mental retardation is diagnosed with cretinism. What hormone deficiency is the main factor in the development of nervous system dysfunction in this disease?

- a. Catecholamines
- b. Androgens
- c. Thyroid hormones**
- d. Glucocorticoids
- e. Estrogens

775. The study of home-made canned vegetables revealed growth of microorganisms with the shape that resembled a tennis racket after inoculation on the Kitt-Tarozzi medium. What disease can be caused by these pathogens?

- a. Botulism**
- b. Escherichiosis
- c. Shigellosis
- d. Cholera
- e. Salmonellosis

776. A patient is diagnosed with acute pancreatitis. For diagnostic purpose it is necessary to measure the activity of the following enzyme in the patient's blood:

- a. Aldolase
- b. Pepsin
- c. LDH
- d. Amylase**
- e. Creatine kinase

777. Chromatographic analysis methods differ in their mechanism of sorbent-sorbate interaction. What partition mechanism is used in ion-exchange chromatography?

- a. Production of coordination compounds of different stability in the phase or on the sorbent surface
- b. Different solubility of the solutes in the stationary phase
- c. Solutes and sorbent producing precipitates of different solubility
- d. Different adsorption capacity of the solid sorbent towards different substances

e. Different ion-exchange capacity of the substances

778. A pharmacy has received a batch of drugs for treatment of upper respiratory tract infection. What drug is used to treat influenza?

a. Rimantadine

- b. Idoxuridine
- c. Methisazone
- d. Doxycycline
- e. Levamisole

779. Surfactants and high-molecular compounds are added into concentrated emulsions to stabilize them. These substances are:

a. Emulsifiers

- b. Solvents
- c. Absorbents
- d. Activators
- e. Catalysts

780. Non-aqueous acid-base titration is used for the substances that have low solubility in water and weak basic or weak acidic properties. Choose the titrant and medium for titration of substances with weak basic properties.

- a. HCl solution in dioxane
- b. HCl solution in anhydrous acetic acid
- c. HCl solution in methanol
- d. HClO solution in anhydrous acetic acid

e. HClO<sub>4</sub> solution in anhydrous acetic acid

781. When an isolated system spontaneously approaches its equilibrium, its entropy:

- a. Demonstrates linear magnification
- b. Approaches infinity

c. Approaches zero

- d. Reaches maximum
- e. Reaches minimum

782. What changes occur with the entropy of an isolated system, when it spontaneously approaches the equilibrium state?

- a. Tends to infinity
- b. Does not change

c. Reaches its maximum

- d. Decreases linearly
- e. Reaches its minimum

783. Dimethylethylamine belongs to:

a. Secondary amines

b. Tertiary amines

- c. Primary amines
- d. -
- e. Quaternary ammonium salts

784. A man came to a doctor complaining of a severe joint pain. Urinalysis shows increased levels of uric acid, which indicates:

- a. Increased glycogenolysis activity
- b. Increased activity of fatty acid beta- oxidation
- c. Increased synthesis of ketone bodies
- d. Increased glycolysis activity

e. Intensive breakdown of purine nucleotides

785. What local anesthetic is used to treat ventricular arrhythmia?

a. Ropivacaine

- b. Bupivacaine
- c. Anesthesin (Benzocaine)
- d. Ultracaine

**e. Lidocaine hydrochloride**

786. A chemist-analyst performs a qualitative analysis of group IV cations. Why is a 3% hydrogen peroxide solution added in the process?

- a. Sediment formation
- b. Gas removal
- c. Formation of colored compounds
- d. Conversion of ions to a lower degree of oxidation

**e. Conversion of ions to a higher degree of oxidation**

787. What drug selectively suppresses the secretion of the gastric glands by blocking H<sub>2</sub>-histamine receptors?

- a. Ipratropium bromide
- b. Omeprazole

**c. Famotidine**

- d. Loratadine
- e. Atropine sulfate

788. Lecithin of various origins, being a surfactant compound, is used in food industry as emulsifying agent. What group of biomolecules does it belong to?

- a. Triacylglycerols (triglycerides)
- b. Sterol esters
- c. Glycolipids
- d. Sulfolipid

**e. Phospholipids**

789. Examination of a 45-year-old man, who for a long time kept to a vegetarian plant-based diet, revealed him to have negative nitrogen balance. What peculiarity of his diet has caused such developments?

- a. Insufficient fat content
- b. Excessive carbohydrate content

**c. Insufficient protein content**

- d. Insufficient vitamin content
- e. Excessive water content

790. A woman with chronic heart failure developed an edematous syndrome. Increased aldosterone levels were detected in her blood. What drug must be prescribed in this case?

- a. Metoprolol
- b. Ketamine

**c. Spironolactone**

- d. Proserine (Neostigmine)
- e. Aceclidine

791. A patient has been hospitalized into the infectious diseases department of a regional hospital with the provisional diagnosis of typhoid fever. What serological reaction must be carried out to confirm the diagnosis?

- a. Wassermann reaction
- b. Elek test

**c. Widal test**

- d. Huddleson reaction
- e. Wright reaction

792. A patient came to the pharmacy to obtain an antidiarrheal agent. What drug would be recommended by the dispensing chemist?

- a. Anesthesin (Benzocaine)
- b. Picolax (Sodium picosulfate)

- c. Ranitidine
- d. Dicaïne (Tetracaine)

**e. Loperamide**

793. What thermodynamic parameter does not allow measuring its absolute value?

- a. Heat capacity
- b. Internal energy**
- c. Thermal effect
- d. Heat
- e. Work

794. Androecium of Brassica oleracea flower has six stamens, with four stamens of inner circle longer than two stamens of outer circle. What is this type of androecium called?

- a. Polydelphous
- b. Monadelphous
- c. Diadelphous
- d. Didynamous

**e. Tetradynamous**

795. Nuciform fruits include a certain type of one-seeded fruit that does not burst when ripe. Its base is enclosed in a cup-shaped cupule formed by the broad part of the peduncle to which the flower was attached. Name this type of fruit:

- a. Samara
- b. Caryopsis
- c. Nutlet

**d. Acorn**

e. Nut

796. Against the background of cardiac glycoside treatment, a person developed an arrhythmia. The doctor prescribed the patient a potassium medicine that successfully normalized the heart rate. Name this potassium medicine.

- a. Verapamil
- b. Novocainamide
- c. Amiodarone

**d. Asparcam**

e. Metoprolol

797. Many species of wild rose are a source of vitamins, fatty oils, and herbal material. Specify the juicy pseudocarps that are harvested as herbal raw material:

- a. Aggregate-accessory fruits
- b. Hesperides
- c. Cenocarp stone-fruits
- d. Coenobia

**e. Rose hips**

798. A woman with candidomycosis was prescribed a drug that is used in cases of fungal pathology of any localization and can cause diarrhea and toxic liver damage. What drug did the doctor prescribe in this case?

- a. Fluconazole**
- b. Mebendazole
- c. Bicillin-5
- d. Chingamine (Chloroquine)
- e. Amoxicillin

799. Paracetamol has antipyretic and analgesic effect. In the human body it is neutralized in the following organ:

- a. Lungs
- b. Liver**
- c. Heart

- d. Spleen
- e. Intestine

800. Salicylic acid and its derivatives are widely used in medicine. This compound belongs to the following class of chemicals:

- a. Heterocyclic compounds
- b. Hydroxycarboxylic acids**
- c. Alcohols
- d. Alkanes
- e. Aldehydes

801. In iodometry, titrimetric quantitative analysis is used to measure the amount of iodine utilized for the oxidation of a reducing agent or released as a result of iodide oxidation. What salt is used to make an iodide solution for iodometry?

- a. Magnesium iodide
- b. Lithium iodide
- c. Sodium iodide
- d. Calcium iodide
- e. Potassium iodide**

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

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

803. An outbreak of acute intestinal infection occurred in a kindergarten. An epidemiological laboratory team has conducted an examination of hand lavage of kitchen workers. What microorganisms in the hand lavage can indicate a fecal contamination?

- a. Streptomyces
- b. C) albicans
- c. E) coli**
- d. Actinomyces
- e. S. aureus

804. A pharmacy network is supplied with significant amount of sterile medical products (bandages, rubber gloves, catheters, etc.). What ensures their sterility during manufacturing?

- a. Alpha irradiation**
- b. Gamma irradiation
- c. Ultraviolet irradiation
- d. Infrared irradiation
- e. Beta irradiation

805. To reproduce Ehrlich carcinoma in a rabbit, a certain amount of benzpyrene (a polycyclic aromatic hydrocarbon) was daily applied to a dehaired patch of skin of the animal. What method is used for tumor modelling in this case?

- a. Hormone administration
- b. Ionizing radiation
- c. Induction**
- d. Transplantation
- e. Explantation

806. A dithizone solution was added into the studied alkaline solution of cations that belong to the IV analytical group. As a result, a compound formed that was coloring not only the organic but also the aqueous phase in red. What cations are present in the solution, as indicated by this analytical effect?

- a.  $\text{Cr}^{3+}$
- b.  $\text{Al}^{3+}$

c.  $\text{Zn}^{2+}$

d.  $\text{Fe}^{3+}$

e.  $\text{Bi}^{3+}$

807. A specimen of *Rosa majalis* fruit was added to the morphological collection. This fruit consists of nutlets embedded in a matrix of fine stiff hairs on the inner surface of the succulent hypanthium.

Name this fruit:

a. Pepo

b. Cremocarp

c. Coenobium

d. Cynarrhodium

e. Hesperidium

808. Microbial survival within environment is facilitated by spore formation. What microorganisms of those listed below are spore formers:

a. Bacteroides

b. Staphylococci

c. Peptococci

d. Peptostreptococci

e. Clostridia

809. The following method can be used to quantitatively determine magnesium sulfate in the solution:

a. Thiocyanate titration

b. Nitrite titration

c. Complexometric titration

d. Acidimetry

e. Argentometry

810. A patient with current coronary heart disease who has had two myocardial infarctions of left ventricular wall presents with bubbling breathing and dyspnea. Pulmonary auscultation reveals moist crackles. What kind of heart failure is it?

a. Subcompensated

b. Compensated

c. Combined

d. Right ventricular

e. Left ventricular

811. A patient has thyrotoxicosis. What drug should be prescribed to this patient to suppress the synthesis of thyroid hormones?

a. Thyroidin

b. Parathyroidin

c. Antistrumin (Potassium iodide)

d. Mercazolil (Thiamazole)

e. L-thyroxine

812. Solutions of colloidal surfactants are typical representatives of lyophilic dispersion systems. What is a characteristic feature of colloidal surfactants?

a. Amphiphilicity (Diphilicity)

b. Non-ionogenicity

c. Polarity

d. Non-polarity

e. Ionogenicity

813. A 52-year-old man complains of sour eructation, heartburn, nausea, epigastric pain, and constipations. What gastric secretion disorder is likely in the patient?

a. Hypochlorhydria

b. Hypersecretion and hyperchlorhydria

c. Hyposecretion

- d. Achylia
- e. Achlorhydria

814. Due to spleen rupture a woman has developed internal hemorrhage with signs of severe hypoxia. What anatomical structure is the most susceptible to hypoxia?

a. Cerebral cortex

- b. Stomach
- c. Kidneys
- d. Muscles
- e. Lungs

815. Name the difference in potentials that occurs due to uneven distribution of electrolytes between the outer and inner surfaces of the cell membrane:

- a. Contact biopotential
- b. Diffuse biopotential
- c. Surface biopotential
- d. Chemical biopotential

e. Membrane potential

816. A patient with heart failure has developed acute edematous syndrome. What drug should be prescribed to make the edemas recede?

a. Furosemide

- b. Nitroglycerine
- c. Nifedipine
- d. Panangin (Potassium aspartate and magnesium aspartate)
- e. Propranolol

817. If in the process of molecular adsorption the solute is being adsorbed more than the solvent, then the following occurs:

a. Negative adsorption

b. Positive adsorption

- c. Selective adsorption
- d. No adsorption
- e. Ion adsorption

818. A patient has acute pancreatitis. What is the leading link in the pathogenesis of this disease?

- a. Arterial hypertension
- b. Atherosclerosis of pancreatic vessels
- c. Disturbed trophism of exocrine pancreatocytes

d. Early activation of trypsin and elastase

e. Autoallergy

819. Potentiometry is one of the electrochemical methods of analysis. This method is based on measuring (determination) of:

- a. Diffuse layer potential
- b. Systemic redox potential
- c. Reference electrode potential

d. Indicator electrode potential

e. Zeta-potential

820. What disperse system can be classified as liquid-liquid based on its aggregate state?

a. Smoke

b. Milk

- c. Lather
- d. Activated carbon
- e. Fog

821. Gypsum water is added to a test solution for analytical determination of barium ions. What visual effect is observed in this case?

**a. Formation of a white precipitate**

- b. Yellow coloring of the solution
- c. Production of a brown gas
- d. Formation of a blue precipitate
- e. A characteristic odor appearing

822. A patient has been hospitalised with diagnosis of diabetes mellitus I type. Decreased rate of oxaloacetate forming is one of the metabolic changes present in the patient. What metabolic process is disrupted as a result?

a. Glycogen mobilization

**b. Citric acid cycle**

- c. Cholesterol synthesis
- d. Glycolysis
- e. Urea synthesis

823. Research of reaction rate dependance from various factors allows to intensify technological processes. What factor textbfHAS NO effect on reaction rate constant?

**a. Reacting agents concentration**

- b. Solid substance dispersion degree
- c. Reagents nature
- d. Solvent nature
- e. Temperature

824. What short-acting loop diuretic can cause significant hypokalemia?

a. Mannitol

**b. Furosemide**

- c. Spironolactone
- d. Triamterene
- e. Amiloride

825. What is the name of the lower expanded hollow part of the pistil that contains ovules in a flower?

**a. Ovary**

- b. Stigma
- c. Receptacle
- d. Style
- e. Gynoecium

826. What unstratified (or, less often, stratified) tissue in plant stems, roots, and needles has a protective integumentary function and a water-storing function?

- a. Epiblem
- b. Epidermis
- c. Exodermis
- d. Periderm
- e. Hypodermis**

827. A female patient with mycoplasmal pneumonia was prescribed doxycycline. What group of antibiotics does this drug belong to?

**a. Tetracyclines**

- b. Penicillines
- c. Cephalosporines
- d. Lincosamides
- e. Macrolides

828. Colloidal systems are widely used in medicine. In pastes:

- a. Dispersed medium - solid, continuous medium - solid
- b. Dispersed medium - solid, continuous medium - liquid**
- c. Dispersed medium - solid, continuous medium - gas
- d. Dispersed medium - liquid, continuous medium - liquid
- e. Dispersed medium - liquid, continuous medium - gas

829. Aldehyde dehydrogenase inhibitors are widely used in the treatment of alcohol dependence. What metabolite causes the feeling of disgust towards alcohol, if its blood level is elevated?

- a. Methanol
- b. Acetaldehyde**
- c. Cholesterol
- d. Glucose
- e. Fructose

830. The titrant of mercurimetry method is:

- a. 0,1mol solution of  $\text{AgNO}_3$
- b. 0,1mol solution of KSCN
- c. 0,1mol solution of  $\text{NH}_4\text{SCN}$
- d. 0,1mol solution of  $\text{Hg}_2(\text{NO}_3)_2$**
- e. 0,1mol solution of  $\text{NaNO}_2$

831. Sanitary microbiological investigation of potable water has detected coliphages. What conclusion can be made about the sanitary-hygienic status of this water?

- a. Artesian water
- b. The water is for industrial use only
- c. The water is safe to drink
- d. Fecal contamination**
- e. The water is safe to drink after boiling

832. In microbiology, the Gram method is the main method for bacteria differentiation by means of staining. In this method, bacteria differentiation into Gram-positive and Gram-negative ones is based on their:

- a. Cell wall structure**
- b. Cytoplasmic membrane structure
- c. Chemical composition of the capsule
- d. Cell size
- e. Presence of ribosomes

833. A hospitalised patient was diagnosed with immunity deficiency that resulted in low resistance against viral infection. What cells are most probably deficient?

- a. T-lymphocytes**
- b. B-lymphocytes
- c. Fibroblasts
- d. Macrophages
- e. Neutrophils

834. What drug is indicated in case of an overdose of depolarizing muscle relaxants?

- a. Prozerin (Neostigmine)**
- b. Naloxone
- c. Magnesium sulfate
- d. Metoprolol
- e. Unithiol

835. A patient developed candidiasis caused by long-term antibiotic treatment. What drug should be used in this case to eliminate candidiasis?

- a. Nystatin**
- b. Rubomycin (Daunorubicin)
- c. Sulfadimezin (Sulfadimidine)
- d. Fumagillin
- e. Interferon

836. Antidepressants can increase the content of catecholamines in the synaptic cleft. What is the mechanism of action of these drugs?

- a. Inhibit xanthine oxidase
- b. Activate aminotransferase

**c. Inhibit monoamine oxidase**

d. Inhibit aminotransferase

e. Activate decarboxylase

837. What compound is formed as a result of interaction between aniline and concentrated sulfuric acid in a high-boiling solvent and is a structural fragment of a large group of medicines?

a. Salicylic acid

b. Gamma-aminobutyric acid

c. Methylamine

**d. Sulfanilic acid**

e. Uric acid

838. Fibrillar proteins can be characterized by the presence of several parallel polypeptide chains in their structure. What fibrillar protein is a component of hair, skin, and nails?

a. Albumin

**b. Keratin**

c. Globulin

d. Histone

e. Prothrombin

839. A patient came to the pharmacy to obtain a drug that contains pancreatic enzymes and can be taken for chronic pancreatitis. What drug would be recommended by the dispensing chemist?

**a. Pancreatine**

b. Triamcinolone

c. Omeprazole

d. Gordox (Aprotinin)

e. Pirenzepine

840. Explain to a doctor, what drug has the effect, closest to acetylcysteine, and can be used as its substitute, if acetylcysteine is not available in a pharmacy:

a. Sodium bicarbonate

b. Codeine phosphate

**c. Ambroxol**

d. Libexin (Prenoxdiazine)

e. Sodium chloride

841. A patient with bronchitis was taking doxycycline hydrochloride. What side effects can develop in the patient after the patient has been taking this drug for some time?

a. Hypertension, arrhythmia

b. Euphoria, tolerance

c. Hypotension, vertigo

**d. Diarrhea, hepatitis**

e. Withdrawal, dependence

842. A doctor has prescribed metoprolol to a person with essential hypertension. As a result of abrupt cessation of treatment, the patient's blood pressure increased. What pathological condition did the patient develop?

**a. Withdrawal syndrome**

b. Drug allergy

c. Idiosyncrasy

d. Pharmacotoxic response

e. Allergic reaction

843. In medical and pharmaceutical practice the phenomena of adsorption, wetting, and adhesion are regularly observed. Name this group of phenomena:

a. Molecular-kinetic phenomena

b. Electrokinetic phenomena

**c. Surface phenomena**

d. Optical phenomena

e. Physico-chemical phenomena

844. The patient with parkinsonism has been prescribed a drug - dopamine precursor - to relieve muscular rigidity. Name this drug:

- a. Atropine sulphate
- b. Scopolamine hydrobromide
- c. Aminazine
- d. Paracetamol

**e. Levodopa**

845. As a result of a car accident, a man (driver) has suffered an extensive blood loss. He presents with rapid breathing, tachycardia, and low blood pressure. What pathological condition is likely to be observed in him one hour after the blood loss?

- a. Erythrocyte hypochromia
- b. Dyslipidemia
- c. Hyperglycemia

**d. Hypovolemia**

e. Erythrocyte hyperchromia

846. A patient with bronchial asthma and pulmonary emphysema presents with dyspnea, sensation of lack of air. What type of hypoxia does this patient have?

- a. Hemic
- b. Exogenic
- c. Circulatory
- d. Tissue

**e. Respiratory**

847. In the postoperative period, the patient was receiving an antibiotic. Over time, the patient started complaining of impaired hearing and vestibular disorders. What group of antibiotics has such side effects?

- a. Cephalosporins
- b. Penicillins

**c. Aminoglycosides**

- d. Tetracyclines
- e. Macrolides

848. A patient with primary hypertension is prescribed captopril. What is this drug's mechanism of action?

- a. Block of slow calcium channels
- b. alpha-adrenergic block
- c. beta-adrenergic block
- d. Angiotensin II receptors block

**e. Inhibition of angiotensin converting enzyme activity**

849. Direct complexometric titration is used to determine the concentration of:

- a. Hydrogen ions
- b. Hydroxide ions
- c. Strong acid anions
- d. Weak acid anions

**e. Metal cations**

850. What hormone can cause hypernatremia and hypokalemia, if its secretion becomes increased?

- a. Atrial natriuretic hormone (peptide)
- b. Parathormone
- c. Adrenaline
- d. Glucagon

**e. Aldosterone**

851. During skill building session in the field of microbiology, a student performed inoculation of

microorganisms into the solid nutrient medium to obtain isolated colonies. How should inoculation loops be sterilized after that?

a. Heating in the burner flame

b. Dry heat sterilization under  $160^{\circ}\text{C}$  for 120-150 minutes

c. Boiling under  $60^{\circ}\text{C}$  five times

d. Soaking in 1% chloramine-B solution

e. Formaldehyde vapor sterilization

852. Narcotic analgesics can induce constipations in a patient. What receptors are affected in such cases?

a. Chemoreceptors

b. Dopamine receptors

c. Glutamate receptors

d. Mechanoreceptors

e. Opiate receptors

853. To determine causative agent of the disease, a Gram-stained smear was prepared from the material obtained from the patient with furunculosis. Staphylococci were detected in the smear. What microscopic presentation allows making this conclusion?

a. Gram-positive cocci in grape-like clusters

b. Gram-negative cocci in grape-like clusters

c. Gram-negative cocci in short chains

d. Gram-negative bacilli in short chains

e. Gram-positive cocci in short chains

854. Disperse systems compose a large part of all dosage forms. Point out the bound disperse system:

a. Suspension

b. Emulsion

c. Aerosol

d. Lyosol

e. Gel

855. The following have been detected in hand lavage of the kindergarten chef: colibacilli, ray fungi, staphylococci, bacilli, mold fungi. What microbes are evidential of fecal contamination of hands?

a. Ray fungi

b. Mold fungi

c. Colibacilli

d. Bacilli

e. Staphylococci

856. What vitamin supplement is typically prescribed along with folic acid in cases of hyperchromic anemia?

a. Retinol

b. Cyanocobalamin

c. Thiamine

d. Fercoven

e. Pyridoxine

857. How is the radial type of leaf blade different from the dorsiventral type?

a. It has spongy parenchyma

b. It has trichomes

c. It has a vascular bundle

d. It has stomata

e. It has hypodermis

858. What method is used for the quantification of bismuth in a preparation?

a. Iodometry

b. Permanganatometry

c. Mercurimetry

**d. Complexonometry**

e. Argentometry

859. Primary protein structure is formed as the result of amino acid polymerization. What bonds between the amino acid residues are characteristic of this structure?

a. Electrostatic

b. Hydrophobic

**c. Peptide**

d. Hydrogen

e. Ion interaction

860. A patient with acute myocardial infarction received anticoagulation therapy. What compound will have anticoagulation effect?

a. Hyaluronic acid

b. Keratan sulfate

**c. Heparin**

d. Chondroitin sulfate

e. Dermatan sulfate

861. A patient presents with intestinal obstruction and a decrease in the bactericidal effect of gastric juice, which contributes to the growth of putrefactive microflora. In this case, increased excretion of a certain substance can be observed in urine. Name this substance.

a. Creatine

**b. Indican**

c. Glucose

d. Protein

e. Lactic acid

862. Uric acid is the end product of purine nucleotide breakdown. Elevated levels of uric acid in blood lead to the development of:

a. Gastritis

b. Hepatitis

c. Diabetes mellitus

d. Glycogenosis

**e. Gout**

863. In the process of silver cations identification reaction HCl and then ammonia solution have been added to the solution. What compound has been produced as a result?

a. AgOH

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

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

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

e. AgCl

864. The patient's 24-hour urine output is 6 liters, its specific gravity varies from 1003 to 1008 g/L. What pathological process can be characterized by these signs?

a. Hypothyroidism

b. Chronic renal failure

c. Diabetes mellitus

d. Acute renal failure

**e. Diabetes insipidus**

865. What component of a plant cell determines the water content in the plant's internal environment, regulates water-salt metabolism, maintains turgor, and accumulates substances?

a. Chloroplasts

b. Endoplasmic reticulum

**c. Vacuoles**

d. Mitochondria

e. Golgi complex

866. A 3.5-year-old child has been diagnosed with dysbacteriosis in the form of critical reduction of gram-positive anaerobic bacteria and increased number of staphylococci and yeast fungi. What preparation should be used for the correction of dysbacteriosis?

- a. Lactoglobulin
- b. Furazolidone
- c. Coli-Proteus bacteriophage
- d. Colibacterin

**e. Bifidumbacterin**

867. Name the psychostimulant with analeptical action, which is a purine derivative:

- a. Sulpiride
- b. Sodium bromide
- c. Tramadol
- d. Medazepam

**e. Caffeine and sodium benzoate**

868. During a surgery, narcosis overdose caused signs of acute hypoxia, indicated by increased heart rate of 124/min. and tachypnea. What type of hypoxia is observed in this case?

**a. Respiratory**

- b. Circulatory
- c. Tissue
- d. Hypoxic
- e. Mixed

869. Specify the analgesic that affects opiate receptors and can cause development of tolerance and dependence:

- a. Voltaren (Diclofenac sodium)
- b. Haloperidol
- c. Phenobarbital
- d. Medazepam

**e. Morphine**

870. A patient, who lives in the area with specific geochemical conditions, was diagnosed with endemic goiter. What microelement deficiency results in development of this pathology?

- a. Na
- b. I**
- c. F
- d. Cl
- e. Br

871. A man suffers from cholelithiasis. What medicine should he be prescribed for biliary colic relief?

- a. Bisacodyl
- b. Contrykal (Aprotinin)
- c. Pancreatin
- d. Almagel (Algeldrate + magnesium hydroxide)

**e. Magnesium sulfate**

872. What local anesthetic is given to patients with cardiac rhythm disorder?

- a. Caffeine and sodium benzoate

**b. Lidocaine**

- c. Paracetamol
- d. Nitrazepam
- e. Morphine hydrochloride

873. When working in the garden, a man accidentally cut his hand. The wound remained untreated. Shortly after that the wounded area developed inflammation with accumulation of exudate that contained numerous viable and degenerate neutrophils. What type of exudate is it?

- a. Catarrhal
- b. Fibrinous
- c. Hemorrhagic
- d. Serous
- e. Purulent**

874. What is the order of the kinetic equation that describes the process of coagulation according to the Smoluchowski theory of rapid coagulation?

- a. Second order**
- b. First order
- c. Fractional order
- d. Third order
- e. Zero order

875. As a result of prolonged starvation, intracellular lipolysis activates in the tissues. What hormone is the activator of this process?

- a. Glucagon**
- b. Cholecalciferol
- c. Insulin
- d. Calcitonin
- e. Oxytocin

876. The absorption zone of the primary anatomical root cortex mainly consists of multi-layered, live, loose parenchyma with starch granules. What tissue is described above?

- a. Mesodermis**
- b. Ectodermis
- c. Periderm
- d. Endodermis
- e. Hypodermis

877. To relieve dry cough, a patient with bronchitis was prescribed a drug that is an alkaloid of yellow horned-poppay. Name this drug:

- a. Oxeladin
- b. Libexin (Prenoxdiazine)
- c. Codeine phosphate
- d. Glaucine hydrochloride**
- e. Codterpin

878. What kind of ground (functional) tissue is characteristic of above-ground organs of succulent plants, Cactaceae in particular?

- a. Folded parenchyma
- b. Starch storage parenchyma
- c. Hydroparenchyma**
- d. Aerenchyma
- e. Spongy parenchyma

879. In the process of coagulation by mixtures of different electrolytes, they seem to counteract each other's effect. Name this phenomenon:

- a. Antagonism**
- b. Mutual coagulation
- c. Sedimentation
- d. Synergism
- e. Additivity

880. A sailor, who had been at sea for 10 months, developed bleeding gums and mobility and loss of healthy teeth. After an examination he was diagnosed with scurvy. What vitamin is deficient in this case, causing this disease?

- a. Vitamin D
- b. Vitamin E

**c. Vitamin C**

- d. Folic acid
- e. Nicotinic acid

881. A man with left ventricular heart failure and signs of developing pulmonary edema was brought into an emergency hospital. What is the primary pathogenetic mechanism of the developed edema in this case?

- a. Membranogenic
- b. Toxic
- c. Colloidal-osmotic

**d. Hydrodynamic**

- e. Lymphogenic

882. To determine the mass-volume fraction of ammonia in the solution, neutralization back titration was used. Specify the pair of titrants necessary in this case:

- a. HCl,  $\text{Hg}(\text{NO}_3)_2$
- b. HCl,  $\text{AgNO}_3$
- c.  $\text{CH}_3\text{COOH}$ , KOH
- d. HCl,  $\text{Hg}_2(\text{NO}_3)_2$

**e. HCl, NaOH**

883. What should be used as an indicator electrode in potentiometric titration aimed at quantifying iron(II) sulfate?

- a. Silver chloride
- b. Glass
- c. Quinhydrone

**d. Platinum**

- e. Antimony

884. A woman with type 1 diabetes mellitus developed hyperglycemic coma. Examination revealed metabolic acidosis. This condition developed because of accumulation of the following in the blood:

- a. Indirect bilirubin

**b. Ketone bodies**

- c. Bile acids
- d. Residual nitrogen
- e. Ammonium ions

885. A patient complains of maldigestion of nutrients and intestinal bloating. The doctor suspects acute pancreatitis and has ordered a diastase (alpha-amylase) activity test to confirm this diagnosis. Activity of this enzyme can be measured based on the breakdown of:

- a. Chitin
- b. Collagen
- c. Cellulose
- d. Albumin

**e. Starch**

886. What drug is advisable for individual malaria prophylaxis?

- a. Ampicillin
- b. Gentamicin

**c. Chingamin**

- d. Rifampicin
- e. Trimethoprim/sulfamethoxazole (Co-trimoxazole)

887. In the epidemiology of certain diseases, a great attention must be paid to fleas as disease carriers. Particularly, the fleas play a major role in the spread of:

- a. Anthrax

**b. Plague**

- c. Typhus
- d. Leptospirosis

e. Relapsing fever

888. In practical classes the group of students have to explore the chemical structure of glucose molecule. Which of the following suits most for simultaneous detection of aldehyde group and glycol fragment in previously mentioned molecule?

- a.  $\text{FeCl}_3$
- b.  $\text{AlCl}_3$
- c.  $\text{KMnO}_4$
- d.  $\text{Cu(OH)}_2$
- e.  $\text{Br}_2$

889. Sulfur sol was obtained by adding 5 mL of a solution of sulfur in alcohol into 20 mL of distilled water. The sol was obtained by the following method:

- a. Double exchange reaction
- b. Reduction reaction
- c. Chemical condensation
- d. Hydrolysis reaction
- e. Solvent substitution

890. Permanganatometry is used in determination of many organic and inorganic compounds. What are the main advantages of permanganatometry over the other oxidimetric methods?

- a. High selectivity and sensitivity when determining compounds
- b. Sufficiently high stability of potassium permanganate and its solutions
- c. Sufficiently high redox potential; it is possible to determine titration end-point without indicator
- d. Pure potassium permanganate is easily available and obtainable
- e. Various types of indicators can be used; in some cases catalysts are necessary to accelerate the reaction

891. Microscopy of subterranean organs of an Asteraceae family plant shows articulated laticifers with anastomoses filled with white latex. It is characteristic of the following plant:

- a. *Taraxacum officinale*
- b. *Achillea millefolium*
- c. *Bidens tripartita*
- d. *Artemisia absinthium*
- e. *Helianthus annuus*

892. A person with essential hypertension was prescribed lisinopril. What is the typical side effect of this medicine?

- a. Constipation
- b. Dry cough
- c. Insomnia
- d. Increased appetite
- e. Vomiting

893. A patient with tuberculosis has been prescribed some anti-tuberculosis preparations. Which of the following chemotherapeutic drugs has an effect on the tuberculosis pathogen?

- a. Phthalylsulfathiazole
- b. Methisazonum
- c. Furacilinum
- d. Sulfadimezinum
- e. Ftivazide

894. Corolla of a zygomorphic monoecious flower consists of 5 petals, the biggest is "banner", two lateral are "wings", and the last two are fused together to form "keel". Name the described corolla that is characteristic of medicinal plants of the Fabaceae family.

- a. Papilionaceous
- b. Saucer-shaped
- c. Ligulate
- d. Tubular

e. Funnelform

895. What medicine increases the risk of toxic effects when taken along with gentamicin?

- a. Penicillin
- b. Methylprednisolone
- c. Caffeine
- d. Furosemide**
- e. Erythromycin

896. In cases of long-term intoxication, a significant decrease in the activity of aminoacyl-tRNA synthetases can be observed. What metabolic process becomes disturbed in such cases?

- a. Biosynthesis of proteins**
- b. RNA processing
- c. DNA repair
- d. Genetic recombination
- e. DNA replication

897. A patient presents with inflammation of the nasal mucosa: redness, edema, profuse mucus discharge from the nasal passages. This clinical presentation corresponds with the following stage of inflammation:

- a. Exudation**
- b. Biochemical
- c. Proliferation
- d. Immunologic
- e. Alteration

898. Wheat has linear inflorescences with biflorous sessile spikelets arranged in two rows. Name this type of inflorescence:

- a. Spike
- b. Spadix
- c. Corymb
- d. Compound spike**
- e. Panicle

899. In the patient's blood, increased activity of AST, LDH1, LDH2, and CPK was detected. In what organ is a pathological process possible in this case?

- a. Liver
- b. Skeletal muscles
- c. Kidneys
- d. Adrenal glands
- e. Heart muscle**

900. Electrokinetic potential is a parameter that measures the charge of proteins, leukocytes, and erythrocytes. At what interface is the electrokinetic potential generated?

- a. Granule-diffuse layer**
- b. Micelle-dispersion medium
- c. Aggregate-potential-determining ions
- d. Core-diffuse layer
- e. Core-adsorption layer

901. A patient with diabetes mellitus presents with thirst, polyuria, and dry skin and mucosa. These signs are caused by the elevated levels of the following substance in the patient's blood:

- a. Glucose**
- b. Phenylalanine
- c. Adrenaline
- d. Urates (uric acid salts)
- e. Cholesterol

902. What broad-spectrum antibiotic is contraindicated for children under 14 years of age because it

disrupts the formation of the skeleton?

- a. Acyclovir
- b. Doxycycline**
- c. Azithromycin
- d. Ampicillin
- e. Ceftriaxone

903. Biopotentials caused by various physiological processes are the result of the following forming at the phase interface:

- a. Absorption layer
- b. -
- c. Electrical double layer**
- d. Diffuse layer
- e. Adhesive layer

904. During absolute starvation, the body uses endogenous water. What substance is the source of endogenous water in the human body?

- a. Proteins
- b. Proteoglycans
- c. Cellulose
- d. Glycogen
- e. Fats**

905. In the drug manufacture it is necessary to follow a complex of measures aimed at prevention of their microbial contamination. What is the name of this complex of measures?

- a. Sterilization
- b. Disinfection
- c. Asepsis**
- d. Deratisation
- e. Antisepsis

906. Phosphate anions and arsenate anions form similar precipitates insoluble in an ammonia solution during their reaction with:

- a. Cobalt sulfate solution
- b. Nessler's reagent
- c. Lead acetate solution
- d. Sodium hydroxide solution
- e. Magnesia mixture (a solution containing  $MgCl_2$ ,  $NH_4Cl$ ,  $NH_3$ )**

907. Microscopy of a smear obtained from the pharyngeal mucosa of a sick child with suspected diphtheria detected yellow-brown bacilli with dark blue thickened ends. What staining method was used in this case?

- a. Neisser stain**
- b. Gram stain
- c. Aujeszky stain
- d. Loeffler stain
- e. Ziehl-Neelsen stain

908. A perennial herbaceous plant has the following characteristic features: calyx with an epicalyx, double perianth, fused stamens with purple anthers, its fruit is a disc-like schizocarp. Name this plant.

- a. *Amygdalus communis*
- b. *Polygonum persicaria*
- c. *Hyoscyamus niger*
- d. *Althaea officinalis***
- e. *Melissa officinalis*

909. A patient has been prescribed drug with antibacterial effect on tuberculosis mycobacteria. What drug is used in tuberculosis treatment and is pyridoxine antivitamin?

- a. Sulfanilamide

- b. Streptomycin
- c. Heparin

**d. Isoniazid**

- e. Trimethoprim/sulfamethoxazole (Co-trimoxazole)

910. Examination of a patient detects excessive growth of bones and soft tissues of the face, enlarged tongue and internal organs, and widened interdental spaces. The patient's condition could have been caused by increased secretion of a certain hormone. Name this hormone.

**a. Somatotropin**

- b. Prolactin
- c. Adrenaline
- d. Thyroxine
- e. Vasopressin

911. A person diagnosed with ischemic heart disease presents with stable angina pectoris, atherosclerosis, and elevated plasma lipids. What class of lipids plays the main role in the pathogenesis of atherosclerosis?

- a. Triglycerides
- b. High density lipoproteins
- c. Fatty acid-albumin complexes

**d. Low density lipoproteins**

- e. Chylomicrons

912. To identify a drug by thin-layer chromatography the following parameter is used:

- a. n
- b. I, A
- c. E, mV

**d. R<sub>f</sub>**

- e. K<sub>p</sub>

913. A woman with trichomoniasis was prescribed a drug that is an imidazole derivative. Name this drug:

- a. Resorcin
- b. Ampicillin

**c. Metronidazole**

- d. Miramistin
- e. Iodinol

914. A patient diagnosed with viral hepatitis developed ascites, jaundice, itching, leg edemas, and dyspnea. What type of jaundice is observed in the patient?

- a. Mechanical
- b. Obstructive

**c. Parenchymatous**

- d. Suprahepatic
- e. Hemolytic

915. Introduction of immune preparation allows to form artificial acquired immunity. What preparation of those listed below is used to form artificial passive immunity?

- a. Brucellosis vaccine
- b. Cholera-anatoxin
- c. BCG vaccine

**d. Antitetanus serum**

- e. DPT vaccine

916. Trypsin is a proteolytic enzyme used to clean purulent wounds. Combined with water, it causes the breakdown of complex organic compounds (proteins, peptides) into simpler ones. According to the modern international Nomenclature and Classification of Enzymes, trypsin belongs to:

- a. Oxidoreductases
- b. Isomerases

**c. Hydrolases**

d. Transferases

e. Ligases

917. A patient was taken to a hospital with acute food poisoning caused by home-made canned mushrooms. The product analysis revealed some microorganisms that develop only in the absence of oxygen. What microorganisms caused the poisoning?

a. Facultative anaerobes

b. Obligate aerobes

c. Microaerophiles

d. Capnophiles

**e. Obligate anaerobes**

918. What drug should be administered for individual prevention of malaria?

a. Rifampicin

b. Ampicillin

c. Biseptol (Co-Trimoxazole)

**d. Chingamin**

e. Gentamicin

919. During the microbiological diagnostics of syphilis, it became necessary to study the nature and degree of mobility of the causative agent. What type of microscopy is used for this purpose at a bacteriological laboratory?

a. Fluorescent microscopy

b. Electron microscopy

**c. Dark-field microscopy**

d. Light-field microscopy

e. X-ray microscopy

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

a. Yellow

**b. White**

c. Blue

d. Green

e. Red

921. Hyperlipemia is observed in a patient 2-3 hours after eating greasy food. 9 hours later lipid ratio becomes normal again. How can this condition be characterised?

a. Hypertrophic obesity

b. Retention hyperlipemia

c. Transport hyperlipemia

d. Hyperplastic obesity

**e. Alimentary hyperlipemia**

922. Heparin is a potent natural anticoagulant, synthesized in mast cells. What is the chemical nature of this compound?

a. Homopolysaccharide

b. Phospholipid

c. Steroid

d. Simple protein

**e. Heteropolysaccharide**

923. Nitrite ions can be detected in the presence of nitrate ions using the following:

a. Dimethylglyoxime

b. Crystalline sodium thiosulfate

c. Crystalline iron (III) sulfate

**d. Crystalline antipyrine in the presence of diluted HCl**

e. Diphenylcarbazone

924. Hemoglobin breakdown begins in the cells of reticuloendothelial system. What enzyme catalyzes the reduction reaction of biliverdine into bilirubin?

- a. beta-glucuronidase
- b. Xanthine oxidase
- c. Biliverdine reductase**
- d. Heme oxygenase
- e. Hexokinase

925. What characteristic is used to choose indicator for titration analysis?

- a. Indicator constant
- b. Transition interval**
- c. Titration indicator
- d. Equivalence point
- e. Titration curve jump

926. A solution contains iodide and chloride ions. Choose the reagent to detect iodide ions:

- a. Hydrogen sulfide water
- b. Chlorine water**
- c. Barium water
- d. Gypsum water
- e. Limewater

927. Liquid dosage forms that contain camphor and chloral hydrate are used in dental practice. What phases are in the state of equilibrium at the eutectic point of the melting point diagram of the camphor-chloral hydrate mixture?

- a. Eutectic melt, chloral hydrate crystals
- b. Eutectic melt, camphor crystals
- c. Eutectic melt, camphor crystals, chloral hydrate crystals**
- d. Camphor crystals, chloral hydrate crystals
- e. Eutectic melt

928. A pharmacy produces a batch of vials with physiological saline for injections. How should they be sterilized?

- a. In a steam-jacketed autoclave chamber
- b. X-ray irradiation
- c. Under pressure in an autoclave**
- d. In a dry heat sterilizer
- e. Ultraviolet irradiation

929. To prevent the development of muscular dystrophy, a doctor prescribed potassium orotate to a patient. This compound is an intermediate product of the synthesis of a certain substance. What substance is it?

- a. Pyrimidine nucleotides**
- b. Bile acids
- c. Glucose
- d. Ketone bodies
- e. Cholesterol

930. Specific reactions used in qualitative analysis make it possible to:

- a. Detect an ion with previous separation
- b. Detect only a certain group of ions
- c. Detect only anions
- d. Detect an ion without previous separation of other ions**
- e. Detect only cations

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

- a. Antimony
- b. Glass
- c. Zinc

d. Silver chloride

e. Quinhydrone

932. Extraction is often used in analysis of medicinal substances. In this method, the degree of extraction of the substance that is being determined depends on the following:

a. Temperature

b. The amount of the substance being extracted

c. pH of the solution

d. The mass of the substance being extracted

e. Distribution coefficient

933. ACE inhibitors cannot be used simultaneously with a certain group of diuretics. Name this group of diuretics.

a. Osmotic diuretics

b. Potassium-sparing diuretics

c. Loop diuretics

d. Carbonic anhydrase inhibitors

e. Thiazide diuretics

934. A patient with a diagnosis of drug poisoning has been admitted to a resuscitation department. The patient is in grave condition. Respiration is rapid, superficial, with periods of apnea (Biot's respiration). What was the main cause of the development of periodic breathing in the patient?

a. Impaired function of spinal cord motoneurons

b. Impaired function of the neuromuscular system

c. Diminished chest mobility

d. Pulmonary dysfunction

e. Inhibition of the respiratory center function

935. Causative agents of infectious diseases can be carried both by humans and animals. Name the group of infections that affect animals and can be passed onto humans:

a. Sapronoses

b. Zoonoses

c. Anthroponoses

d. Mixed

e. Zooanthroponoses

936. To enhance the solubility of the individual components of a number of liquid drug formulations, the colloidal surfactant are added. This process is based on the following physico-chemical phenomenon:

a. Coagulation

b. Solubilization

c. Diffusion

d. Extraction

e. Sedimentation

937. Recommend the patient with glaucoma an M-cholinomimetic agent:

a. Ephedrine hydrochloride

b. Levomycetin (Chloramphenicol)

c. Pilocarpine hydrochloride

d. Sulfacyl-sodium (Sulfacetamide)

e. Atropine sulfate

938. What antibiotic is used for treatment of syphilis?

a. Kanamycin

b. Streptomycin

c. Amphotericin

d. Benzylpenicillin

e. Nystatin

939. Chromatographic methods can be classified by the mechanism of the separation process. What type of chromatography includes the gas-liquid chromatographic method?

- a. Affinity chromatography
- b. Adsorption chromatography
- c. Ion exchange chromatography
- d. Distribution chromatography**
- e. Gel chromatography

940. Thermolabile medicinal preparation for extemporal use was heated to  $65^{\circ}\text{C}$  thrice with intervals of one day between the heatings. What method of sterilization was used in this case?

- a. Tyndallization**
- b. Filtration
- c. Pasteurization
- d. Calcination
- e. Koch's steam sterilization

941. What must be used to obtain a stable direct emulsion?

- a. Lead stearate
- b. Hydrophilic emulsifier**
- c. Hydrophobic emulsifier
- d. Any emulsifier
- e. Calcium oleate

942. What characteristic is used in titrimetric methods of analysis, when choosing the indicator?

- a. Indicator constant
- b. Titration jump
- c. Transition interval**
- d. Titration index
- e. Neutralization point

943. An analytical chemist conducts qualitative analysis of IV group cations. What reagent can be used to determine zinc?

- a. Dithizone**
- b. Alizarin
- c. Diphenylamine
- d. Thiourea
- e. Murexide

944. What geometrical shape does methane molecule have?

- a. Triangular
- b. Planar
- c. Tetrahedral**
- d. Spherical
- e. Linear

945. A patient at the gastroenterological department presents with disturbed digestion of proteins, which is why the activation of the decay of proteins can be observed in the patient's large intestine. What compound forms in a large amount under these conditions?

- a. Glucose
- b. Putrescine**
- c. Cholesterol
- d. Glycogen
- e. Glycerine

946. Leaves damage by mosaic discoloration has been detected at medicinal plantations. What microorganisms are the cause?

- a. Plant-pathogenic viruses**
- b. Plant-pathogenic fungi
- c. Protozoa

- d. Plant-pathogenic bacteria
- e. Rickettsia

947. A patient with high fever and pain in throat when swallowing is diagnosed with tonsillitis. Which of the listed symptoms is a local feature of acute inflammation?

- a. Increased ESR
- b. Leukocytosis
- c. Reddening**
- d. Fever
- e. Tachycardia

948. Mantoux skin test is used to screen school children for infection with Mycobacterium tuberculosis. What testing agent is necessary for this procedure?

- a. Anti-anthrax vaccine (STI)
- b. Tuberculin**
- c. BCG vaccine
- d. Brucellin
- e. Anthraxinum

949. A patient with hyperproduction of thyroid hormones has been prescribed Merkazolilum. This drug inhibits the following enzyme of iodothyronine synthesis:

- a. Iodide peroxidase**
- b. Reductase
- c. Decarboxylase
- d. Aromatase
- e. Aminotransferase

950. Phosphorylation reactions in the cell are catalyzed by enzymes that have the trivial name of "kinases". What class of enzymes do they belong to?

- a. Transferases**
- b. Isomerases
- c. Oxidoreductases
- d. Lyases
- e. Ligases

951. Main process of ammonia neutralization occurs in the liver. Arginine decomposition reaction that produces urea as a result is catalyzed with arginase. What group of enzymes does arginase belong to?

- a. Oxidoreductases
- b. Synthetases
- c. Isomerases
- d. Transferases
- e. Hydrolases**

952. In the age of 5 months the child had measles antibodies in the blood. By the age of 1 year these antibodies disappeared from the child's blood. Why were these antibodies present in the child's blood?

- a. Non-specific resistance
- b. Innate immunity
- c. Acquired natural passive immunity**
- d. Acquired natural active immunity
- e. Artificial immunity

953. The 55-year-old patient has been diagnosed with angina pectoris. Calcium channel-blocking agent was prescribed for treatment. Name this agent:

- a. Amlodipine**
- b. Atenolol
- c. Guanethidine
- d. Labetalol

e. Reserpine

954. Due to a case of diphtheria in the kindergarten, all the children and personnel undergo examination for early detection of the disease and its carriers. What material must be taken for analysis?

- a. Pharyngeal swab
- b. Wound material
- c. Nasal swab
- d. Blood

**e. Pharyngeal and nasal swabs**

955. The State Pharmacopoeia of Ukraine includes the method of determining molar mass of a polymer, which is based on the following property of high-molecular substances:

- a. Saturated vapor pressure
- b. Freezing point
- c. Light scattering
- d. Osmotic pressure

**e. Viscosity**

956. A quantity of medicine expressed in units of mass (milligram, gram), volume, or bioactivity (units of activity) is called:

- a. Dosage form
- b. Speed of action
- c. Effectiveness
- d. Therapeutic index

**e. Dose**

957. In the dentist's office, a patient developed asphyxia caused by aspiration of a small instrument. What type of respiratory failure is observed in this case?

- a. Restrictive
- b. Perfusion
- c. Dysregulatory
- d. Diffusion

**e. Obstructive**

958. Allopurinol is used to treat gout. What is the mechanism of action of this drug?

- a. Inhibitor of purine nucleotide synthesis
- b. Competitive inhibitor of xanthine oxidase**
- c. Xanthine oxidase coenzyme
- d. Xanthine oxidase activator
- e. Activator of purine nucleotide catabolism

959. What is the name of the phenomenon when one drug enhances the effect of another?

- a. Antagonism
- b. Sensitization
- c. Withdrawal

**d. Synergism**

e. Tachyphylaxis

960. What is the name of an elongated dehiscent fruit formed from a coenocarpous gynoecium and divided by a membranous partition with seeds?

- a. Capsule
- b. Legume

**c. Silique**

- d. Cremocarp
- e. Disk-shaped schizocarp

961. Sol  $\text{Al}(\text{OH})_3$  was produced as a result of treatment of freshly prepared  $\text{Al}(\text{OH})_3$  precipitate with a small amount of HCl solution. What phenomenon underlies the sol production?

- a. Washing with a solvent
- b. Chemical condensation
- c. Chemical peptization**
- d. Physical condensation
- e. Mechanical dispersion

962. A solution being analyzed contains ammonium and sodium cations. What reagent can detect sodium cations in this solution?

- a. Potassium hydrotartrate
- b. Potassium oxalate
- c. Potassium tetraiodomercurate(II)
- d. Uranyl zinc acetate**
- e. Potassium benzoate

963. Cases of tonsillitis periodically occur in the children that attend a kindergarten. During preventive examination, a medical laboratory scientist obtained pharyngeal swabs from ten children and stained the obtained material using the Neisser technique. Microscopy detects thin yellow rod-shaped microorganisms with dark brown thickenings at their ends, arranged in the shape of Roman numerals X and V. What infectious disease can be caused by the detected causative agents?

- a. Diphtheria**
- b. Infectious mononucleosis
- c. Pneumonia
- d. Scarlet fever
- e. Tuberculosis

964. Jelly is one of the promising dosage forms. Name the process, when the initial structure of a mechanically destroyed jelly spontaneously restores:

- a. Diffusion
- b. Gelation
- c. Syneresis
- d. Stratification
- e. Thixotropy**

965. What standard solution can be used to standardize the solution of I<sub>2</sub>?

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

966. During a practical session in pharmaceutical botany, the students were studying herbarium specimens of Asteraceae family plants. What plant of this family has flowers that are all yellow, zygomorphic, ligulate, and bisexual?

- a. Taraxacum officinalis**
- b. Echinacea purpurea
- c. Bidens tripartita
- d. Centaurea cyanus
- e. Achillea millefolium

967. To obtain water-soluble iodine preparations (iodoforms), iodine is dissolved in surfactants that form micelles. The process, when compounds that are insoluble in a certain solvent, spontaneously dissolve in the micellar systems, is called:

- a. Neutralization
- b. Sedimentation
- c. Adsorption
- d. Solubilization**
- e. Coagulation

968. The material obtained from a patient with suspected acute Salmonella-induced gastroenteritis

was sent to a bacteriological laboratory. What should be used in this case for serological identification of the isolated pure bacterial culture?

- a. Erythrocytic salmonellosis diagnosticum
- b. Live pure culture of Salmonella
- c. Agglutinating diagnostic serum for salmonellosis**
- d. Patient's blood serum
- e. Salmonellosis diagnosticum

969. What method is used for simultaneous elimination of the effect of foreign substances, concentration, and determination of concentration?

- a. Extraction-photometric analysis**
- b. Polarimetry
- c. Fluorimetry
- d. Refractometry
- e. Differential spectrophotometry

970. A pregnant woman develops leg edemas in the evening. In the morning, the edemas disappear. What pathogenetic factor contributes to the development of edema in this case?

- a. Increase of oncotic blood pressure
- b. Increase of hydrostatic blood pressure**
- c. Hyperglycemia
- d. Decrease of hydrostatic blood pressure
- e. Decrease of oncotic blood pressure

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

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

972. What drug can be used to stop a bronchospasm?

- a. Salbutamol**
- b. Aspirin
- c. Amoxicillin
- d. Omnoponum
- e. Atenolol

973. According to the Smoluchowski coagulation theory, the process of coagulation can be described with the kinetic equation of:

- a. The first order
- b. The second order**
- c. The fraction order
- d. The zero order
- e. The third order

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

- a. Silver(I)**
- b. Mercury(I)
- c. Mercury(II)
- d. Lead(II)
- e. Tin(II)

975. Entropy, as one of the main thermodynamic functions, is a measure of:

- a. Internal energy of a system
- b. Energy that can be used to perform work

- c. Enthalpy
- d. Total energy of a system

**e. Dissipated energy**

976. What substance is a unique accumulator, donor, and transformer of energy within the body?

- a. Creatine phosphate
- b. Succinyl-CoA
- c. Phosphoenolpyruvate

**d. Adenosine triphosphate**

e. Acetyl-CoA

977. Name the ability of a drug to accumulate within the patient's body:

a. Synergism

**b. Cumulation**

- c. Allergy
- d. Antagonism
- e. Habituation

978. Gout develops when purine nucleotide metabolism is disturbed. The doctor prescribed the patient allopurinol that is a competitive inhibitor of:

a. Alcohol dehydrogenase

**b. Xanthine oxidase**

- c. Succinate dehydrogenase
- d. Hexokinase
- e. Lactate dehydrogenase

979. What antidote must be used in case of narcotic analgesics overdose?

- a. Diazepam
- b. Calcium chloride
- c. Caffeine and sodium benzoate

**d. Naloxone**

e. Unithiol (Dimercaptopropansulfonate sodium)

980. Under what condition is the solubilization process possible?

- a. Surfactant was comminuted before the dissolution
- b. Solute has high solubility in a certain solvent

**c. Surfactant is in the form of micelles**

- d. Surfactant concentration in the solution is arbitrary
- e. Surfactant is in the form of molecules

981. What cation is present in the solution, if its heating with an alkali produces a gas with pungent odor?

**a. Ammonium**

- b. Mercury(I)
- c. Lead(II)
- d. Mercury(II)
- e. Silver(I)

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

- a. Powders
- b. Emulsions
- c. Aerosols

**d. Suspensions**

e. Foams

983. Name the process of cell membrane saturation with a fat-like substance - suberin:

- a. Lignification
- b. Cutinization
- c. Mineralization

d. Suberization

e. Mucification

984. What type of colloidal systems are foams?

a. Liquid-solid

b. Solid-liquid

c. Gas-gas

d. Liquid-liquid

e. Gas-liquid

985. What compound has no carboxyl group but nevertheless is called an acid?

a. Picric acid

b. Tartaric acid

c. Lactic acid

d. Valeric acid

e. Malic acid

986. Colloidal systems are widely used in medicine. In emulsions:

a. Dispersed medium - liquid, continuous medium - gas

b. Dispersed medium - gas, continuous medium - solid

c. Dispersed medium - liquid, continuous medium - solid

d. Dispersed medium - liquid, continuous medium - liquid

e. Dispersed medium - gas, continuous medium - liquid

987. The antitumor agent 5-fluorouracil blocks the enzyme that attaches the methyl group to deoxyuridine monophosphate (dUMP). What reaction becomes inhibited, when this medicine is used?

a. Synthesis of guanosine monophosphate

b. Synthesis of thymidine monophosphate

c. Synthesis of glucose monophosphate

d. Synthesis of glycerol monophosphate

e. Synthesis of adenosine monophosphate

988. Both scientific and folk medicine uses medicinal plant *Glycyrrhiza glabra* L. What part of the plant is harvested?

a. Leaves

b. Grass

c. Inflorescence

d. Seeds

e. Roots and rhizomes

989. What will be the order of the reaction if one of the reagents participating in a bimolecular reaction was taken in a large excess?

a. Third order

b. Pseudomonomolecular order

c. The order can be determined based on the substance taken in excess

d. The order would be greater than the molecularity

e. The order would be the same as the molecularity

990. A patient in the state of ketoacidotic coma presents with loud rapid respiration: labored expiration with tension of expiratory muscles occurs after deep inspiration. Name this type of pathologic respiration:

a. Kussmaul's

b. Stenotic

c. Biot's

d. Cheyne-Stokes'

e. Gasping

991. After a traffic accident the driver presents with increased blood glucose. What mechanism leads to hyperglycemia in this case?

- a. Decreased production of insulin
- b. Decreased tone of parasympathetic nervous system
- c. Increased production of somatotrophic hormone
- d. Decreased production of glucagon
- e. Sympathoadrenal system activation**

992. It is known that heterologous antisera are obtained by means of animal immunization. What complications can arise when they are introduced into human body?

- a. Sensitivity loss
- b. Visual impairment
- c. Water-electrolyte imbalance
- d. Gastrointestinal disorders

**e. Allergic response**

993. A woman with peptic ulcer disease of the stomach was prescribed antibacterial treatment. It is aimed at the following pathogen:

- a. *Cl. trachomatis*
- b. *H. pylori***
- c. *Cl. perfringens*
- d. *St. aureus*
- e. *E. coli*

994. A patient has developed megaloblastic anemia on a background of alcoholic hepatocirrhosis. The main cause of anemia in this patient is the following vitamin deficiency:

- a. Pantothenic acid
- b. Folic acid**
- c. Biotin
- d. Thiamin
- e. Lipoic acid

995. Collagen, gelatin, keratin, and myosin are the proteins that are formed with peptide bonds and resemble long threads in shape. Name this type of proteins:

- a. Fibrillar proteins**
- b. -
- c. Structured proteins
- d. Chain proteins
- e. Globular proteins

996. What anions interfere with the determination of halide ions by means of the Volhard method, because they form a strong colorless complex with iron(III) ions?

- a.  $\text{NO}_3^-$
- b.  $\text{F}^-$**
- c.  $\text{MnO}_4^-$
- d.  $\text{NO}_2^-$
- e.  $\text{SO}_3^{2-}$

997. Most often, the quantitative content of primary and secondary aromatic amines in drugs is determined using the following method:

- a. Ascorbinometry
- b. Permanganatometry
- c. Cerimetry
- d. Nitritometry**
- e. Titanometry

998. The structure of the bacterial cell that provides microbes with increased resistance to the environmental factors and can remain intact for a long time can be detected by staining a smear according to the Ozheshko technique. What is this structure called?

- a. Pilus
- b. Flagella**

c. Spore

d. Plasmid

e. Capsule

999. What drug is an H<sub>2</sub>-histamine receptor blocker?

a. Omeprazole

b. Gastrotzepin (Pirenzepine)

c. Famotidine

d. Almagel

e. Allochol

1000. What specific reagent is used in the qualitative analysis for Fe<sup>2+</sup> cations?

a. NaOH

b. K<sub>2</sub>Na[Co(NO<sub>2</sub>)<sub>6</sub>]

c. NH<sub>4</sub>OH

d. K<sub>4</sub>[Fe(CN)<sub>6</sub>]

e. K<sub>3</sub>[Fe(CN)<sub>6</sub>]

1001. Pathogenic microorganisms produce various enzymes in order to penetrate body tissues and spread there. Point out these enzymes among those named below:

a. Hyaluronidase, lecithinase

b. Lyase, ligase

c. Oxydase, catalase

d. Esterase, protease

e. Transferase, nuclease

1002. Which one of the listed drugs can be used to treat candidiasis?

a. Nystatin

b. Clindamycin

c. Azithromycin

d. Doxycycline

e. Ceftriaxone

1003. For two weeks, a man has been taking tetracycline without a doctor's prescription for treatment of furunculosis. A yellowish color of the skin and sclera is observed in this man. When interviewing this person, a pharmacist determined that his condition developed after taking the medicines. What type of jaundice has developed in this case?

a. Hereditary

b. Hepatic

c. Subhepatic

d. Hemolytic

e. Cholestatic

1004. Potassium dichromate solution is to be analyzed. What physicochemical method of analysis will be used to determine its concentration?

a. Conductometric titration

b. Polarimetry

c. Spectrophotometry

d. Fluorimetry

e. Coulometry

1005. A certain dioecious plant commonly grows at the forest edge. It is a shrub with thorned sprouts. Its fruit is a round black coenocarpous drupe (pyrenarium) with 3-4 seeds. Name this plant:

a. Hippophae rhamnoides

b. Crataegus sanguinea

c. Rosa canina

d. Sambucus nigra

e. Rhamnus cathartica

1006. Amino acids can participate in a large number of metabolic processes. What amino acid functions as a donor of methyl groups (-CH<sub>3</sub>)?

- a. Leucine
- b. Valine
- c. Methionine**
- d. Isoleucine
- e. Tryptophan

1007. Phytopathogenic microorganisms can significantly affect the yield of medicinal plants by decreasing their biomass or content of active substances. A plant afflicted with phytopathogenic microorganisms can develop rot in the organs and tissues rich in water, which leads to discoloration and changes in taste and odor. What microorganisms are the most common cause of rot?

- a. Mycoplasma and rickettsia
- b. Viruses and bacteria
- c. Fungi and bacteria**
- d. Mycoplasma and viroids
- e. Viruses and rickettsia

1008. A certain part of the primary structure of a root has cells with Casparian strips, impregnated with suberin. What tissue of the primary structure of a root contains these cells?

- a. Epiblem
- b. Endodermis**
- c. Mesodermis
- d. Pericycle
- e. Exodermis

1009. Pterin derivatives are used as antitumor agents, because they are the equivalents of the coenzyme required for the synthesis of thiamine monophosphate. This coenzyme is the active form of the following vitamin:

- a. Ascorbic acid
- b. Riboflavin
- c. Folic acid**
- d. Lipoic acid
- e. Thiamine

1010. To treat peptic ulcer disease of the stomach, the patient was prescribed an H<sub>2</sub>-receptor antagonist under the brand name of Quamatel. What can be used as a substitute, if this brand is not available in the pharmacy?

- a. Pantoprazole
- b. Famotidine**
- c. Omeprazole
- d. De-Nol (Bismuth subnitrate)
- e. Pirenzepine

1011. Examination of a sputum sample obtained from a patient provisionally diagnosed with tuberculosis revealed thin, long, slightly curved, rod-shaped microorganisms in the specimen. The microorganisms were stained ruby-red and arranged in strands. What staining method was used in this case?

- a. Ozheshko
- b. Loeffler
- c. Ziehl-Neelsen**
- d. Gram
- e. Romanowsky-Giemsa

1012. Alimentary hyperglycemia is observed after eating carbohydrate-rich foods. What hepatocyte enzyme activity is induced the most in this case?

- a. Aldolase
- b. Phosphorylase

c. Isocitrate dehydrogenase

**d. Glucokinase**

e. Glucose-6-phosphatase

1013. What reaction must be conducted by an analytical chemist during the preliminary tests to determine chromium(III) ions?

a. Reaction with ammonia

b. Reaction with sodium hydroxide

c. Reaction with sodium hydroxide and hydrogen peroxide

d. Reaction with potassium permanganate

**e. Reaction for formation of a perchromic acid after preliminary oxidation of chromium**

1014. What chemotherapeutic agent is a drug of choice for treatment of herpes?

a. Doxycycline hydrochloride

b. Chingamin

c. Metronidazole

d. Rifampicin

**e. Acyclovir**

1015. A patient developed a hemorrhage caused by a long-term use of neodicumarin (ethyl biscoumacetate). What neodicumarin antagonist must be used in this case?

a. Etamsylate

**b. Vicasol (Menadione)**

c. Ascorbic acid

d. Aminocaproic acid

e. Fibrinogen

1016. Quantitative content of hydrogen peroxide can be determined by means of the following self-indicator method:

a. Iodometry

b. Nitritometry

c. Bromatometry

d. Argentometry

**e. Permanganatometry**

1017. What antihistamine with marked sedative effect should be prescribed to be taken before bed?

a. Loratadine

b. Guttalax (Sodium picosulfate)

**c. Dimedrol (Diphenhydramin)**

d. Fexofenadine

e. Aeries (Desloratadine)

1018. While on a tour, the students have been collecting summer shoots of *Equiseti arvensis* that were hard to the touch. What type of the outer shell is characteristic of the epidermal cells of this plant?

a. Lignified

b. Slimified

c. Suberized

d. Cutinized

**e. Mineralized**

1019. During examination of a patient the otolaryngologist noted that the patient's tonsils are extremely swollen, hyperemic, and have gray coating. Microscopy of the coating sample detects there gram-positive bacilli arranged at an angle to each other. What disease can be suspected?

**a. Diphtheria**

b. Tonsillitis

c. Scarlet fever

d. Meningococcal nasopharyngitis

e. Mumps

1020. What pharmacological effect of acetylsalicylic acid allows using it for prevention of thrombosis in patients with ischemic heart disease?

- a. Antiaggregant
- b. Anti-inflammatory
- c. Antipyretic
- d. Ulcerogenic
- e. Analgesic

1021. A patient with bronchial asthma was prescribed a drug with the mechanism of action that is primarily based on the stimulation of beta<sub>2</sub> adrenergic receptors. Name this drug:

- a. Droperidol
- b. Clonidine
- c. Salbutamol
- d. Adrenaline hydrochloride
- e. Isadrine (Isoprenaline)

1022. If the amount of high-molecular substance added to the given sol is extremely small, it is possible its stability will decrease, instead of increase. What is this phenomenon called?

- a. Sedimentation
- b. Sensitization
- c. Solubilization
- d. Syneresis
- e. Synergism

1023. A patient with epilepsy was prescribed sodium valproate. What is the mechanism of action of this drug?

- a. Stimulation of alpha-adrenergic receptors
- b. Increasing GABA levels in the brain
- c. Stimulation of beta-adrenergic receptors
- d. Stimulation of opioid receptors
- e. Stimulation of butyrylcholinesterase activity

1024. A chemical analytical laboratory uses a reaction with dimethylglyoxime to identify nickel cations. What will be the color of the precipitate that forms as a result of this reaction?

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

1025. Natural peptides can carry out various functions. What bioactive peptide is a major antioxidant and functions as a coenzyme?

- a. Oxytocin
- b. Bradykinin
- c. Anserine
- d. Glutathione
- e. Liberin

1026. When dosage forms are being tested by accelerated aging method, it is assumed that decomposition reaction of the active substance is of the following order:

- a. First-order
- b. Third-order
- c. Reaction order does not matter
- d. Second-order
- e. Zero-order

1027. What substance causes impaired biotin absorption?

- a. Transferrin
- b. Avidin

- c. Albumin
- d. Ferritin
- e. Globulin

1028. After an 8-year-old boy had eaten some strawberries he developed red itching spots on his skin, urticaria. What bioactive substance causes the itching sensation in this case?

- a. Cathepsin
- b. Complement component C3a
- c. Prostaglandin E2
- d. Histamine**
- e. Tissue hyaluronidase

1029. Albinism can be characterized by disturbed metabolism of a certain amino acid. Name this amino acid.

- a. Glutamine
- b. Phenylalanine**
- c. Tryptophan
- d. Histidine
- e. Methionine

1030. A pathological process in the blood serum has caused increased ammonia levels. What is the main way of toxic ammonia neutralization?

- a. Alanine synthesis
- b. Uric acid synthesis
- c. Ammonium salt synthesis
- d. Urea synthesis**
- e. Glycine synthesis

1031. Which one of the listed ions has the greatest mobility?

- a.  $H_3O^+$**
- b.  $Cl^-$
- c.  $K^+$
- d.  $Na^+$
- e.  $CN^-$

1032. One of the biological functions performed by glycoproteins in the body is a regulatory (hormone) function. What hormone is a glycoprotein based on its chemical nature?

- a. Insulin
- b. Aldosterone
- c. Thyrotropin**
- d. Cortisol
- e. Glucagon

1033. A dispensing chemist performs identification of pharmaceutical substance using ultraviolet spectrophotometry. The specialist obtains the graph of optical density to wavelength ratio, which is called:

- a. Calibration curve
- b. Emission spectrum
- c. Logarithmic curve
- d. Light absorption curve**
- e. Titration curve

1034. Transverse section of an axial organ has revealed conductive bundle with phloem and xylem radiating in separate alternate areas. Name the organ and type of conductive bundle:

- a. Bundle is amphivasal (lepto centric), organ is monocotyledon rhizome
- b. Bundle is collateral closed, organ is monocotyledon stem
- c. Bundle is radial, organ is root of primary structure**
- d. Bundle is amphicribal (hadro centric), organ is fern rhizome
- e. Bundle is collateral open, organ is dicotyledon stem

1035. Name the serums made from blood donated by volunteers or reconvalescent donors:

- a. Attenuated
- b. Corpuscular
- c. Autoimmune
- d. Homologous**
- e. Heterologous

1036. What emulsions can be stabilized by emulsifiers, if the solubility of these emulsifiers is higher in water than in oil?

- a. Invert emulsions
- b. Concentrated emulsions
- c. Direct emulsions**
- d. Emulsions of the second type
- e. Dilute emulsions

1037. Choose the weakest carboxylic acid basing on its pKa value:

- a. Acetic acid (pKa = 4.7)
- b. Propionic acid (pKa = 4.9)**
- c. Butyric acid (pKa = 4.82)
- d. Formic acid (pKa = 3.7)
- e. Lactic acid (pKa = 3.9)

1038. A fibrinolysis inhibitor was used to stop postpartum bleeding. Name this drug.

- a. Thrombin
- b. Calcium chloride
- c. Nettle leaves
- d. Hemostatic sponge
- e. Aminocaproic acid**

1039. What cation can be detected with Chugaiev's agent (Dimethylglyoxime)?

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

1040. All strong electrolytes cause sol coagulation, if added to a sol in a sufficient amount. The coagulant ion in this case is a particle with the charge that is:

- a. Identical to the charge of the colloidal particle
- b. Opposite to the charge of the colloidal particle**
- c. Identical to potential-determining ions
- d. Identical to the charge of the nucleus
- e. Opposite to the counterions of the adsorption layer

1041. A certain drug is a first-line antituberculosis agent. Its possible side effects include polyneuritis, hepatotoxicity, mental disorders, and allergic reactions. Name this drug.

- a. Meloxicam
- b. Clotrimazole
- c. Atropine
- d. Adrenaline hydrochloride
- e. Isoniazid**

1042. Investigation of bacterial contamination of indoor air in a pharmacy takes into account the total number of microorganisms present in a certain air volume, as well as qualitative content of indoor air microflora. Name the sanitary-indicative microorganisms for indoor air:

- a. Colibacillus
- b. Sarcina
- c. Staphylococcus and streptococcus**
- d. Fungi and yeasts

e. Chromobacterium

1043. In hot weather on the leaf tips of *Tilia cordata* and on the crenations along its leaf edges, drops of liquid are released through the water stomata. Name the structures located on the plant leaves, through which liquid water can be passively released:

a. Glandules

**b. Hydathodes**

c. Osmophores

d. Nectaries

e. Hydropotes

1044. What substance is used as a primary standard in permanganometry, bromatometry, dichromatometry, iodometry, and cerimetry?

a. Ammonium acetate

b. Sodium chloride

**c. Arsenic(III) oxide**

d. Sodium carbonate

e. Potassium hydroxide

1045. After parenteral administration of iron preparations, the patient presents with pain behind the sternum and redness of the face and neck. What drug should be administered in this case?

a. Vitamin A

b. Ascorbic acid

c. Folic acid

**d. Deferoxamine**

e. Cyanocobalamin

1046. Pleural tap performed by a doctor has yielded a significant amount of yellow exudate. Microscopy detected neutrophils in the exudate. What type of exudate is it characteristic of?

a. Bloody

**b. Purulent**

c. Fibrinous

d. Serous

e. Hemorrhagic

1047. From the patient's pleural cavity, an exudate sample was obtained. This sample has the following composition: protein -- 34 g/L, blood corpuscles -- 3600 in mL, predominantly neutrophils, pH -- 6.8. What type of exudate is it?

a. Mixed

**b. Purulent**

c. Serous

d. Fibrinous

e. Hemorrhagic

1048. A patient with myxedema was recommended substitution therapy. What hormones are used for this purpose?

**a. Thyroid hormones**

b. Glucocorticoids

c. Mineralocorticoids

d. Androgens

e. Estrogens

1049. What is the taxonomic division of a plant with periphloematic fibrovascular bundles that were detected during the study of the anatomical structure of its rhizome?

**a. Polypodiophyta**

b. Bryobionta

c. Angiosperms

d. Green algae

e. Gymnosperms

1050. Morphological analysis of poplar inflorescence showed that it is a simple monopodial inflorescence: main axis is drooping, the flowers are sessile, unisexual. Specify the type of inflorescence:

- a. Cyme
- b. Capitulum
- c. Head
- d. Catkin**
- e. Panicle

1051. When measuring the antimicrobial activity of drugs, their minimum concentration that suppresses the growth of microbes must be determined. What is this parameter?

- a. -
- b. The lowest drug concentration that causes development of selective strains of test cultures
- c. The lowest drug concentration that has a bactericidal effect
- d. The lowest drug concentration that inhibits growth of a bacterial test culture**
- e. The lowest drug concentration that inhibits enzyme biosynthesis in the macroorganism

1052. Selective solvents are used in laboratories and factories to isolate and refine essential oils, alkaloids, antibiotics, and other pharmaceutical substances. This process is called:

- a. Sedimentation
- b. Coagulation
- c. Flocculation
- d. Flotation
- e. Extraction**

1053. Short lignified stem is characteristic of the *Allium cepa* genera. It is a part of modified sprout that is called:

- a. Phylloclade
- b. Tendril
- c. Tuber
- d. Bulb**
- e. Rhizome

1054. After acute nitrite poisoning, the patient was diagnosed with acquired toxic hemolytic anemia. A large amount of regenerative forms of erythrocytes were detected in the patient's blood smear. Name these cells.

- a. Reticulocytes**
- b. Microcytes
- c. Schistocytes
- d. Drepanocytes
- e. Annulocytes (Codocytes)

1055. A pregnant woman has received intravenously a uterotonic to stimulate uterine activity. This drug is a synthetic analog of a hormone of the posterior pituitary. Name this drug:

- a. Anaprilin (Propranolol)
- b. Folliculin (Estrone)
- c. Oxytocin**
- d. Proserin
- e. Dinoprost

1056. What substance can be used to prepare primary standard solutions of titrants?

- a. HCl
- b.  $K_2Cr_2O_7$**
- c.  $I_2$
- d. NaOH
- e.  $KMnO_4$

1057. What heterocycle has acidophobic properties?

- a. Quinoline

b. Pyrimidine

c. Pyrrole

d. Pteridine

e. Thiophene

1058. What method is used to destroy an emulsion?

a. Emulsification

b. Homogenization

c. Condensation

d. Centrifugation

e. Dispersion

1059. What is the mechanism of action of a catalyst in a chemical reaction?

a. Increases activation energy

b. Does not change the activation energy

c. Reduces activation energy

d. Changes the nature of the reagents

e. Changes the degree of dispersion

1060. What anion of the 2nd analytic group produces black precipitate with group reagent  $\text{AgNO}_3$ ?

a.  $\text{I}^-$

b.  $\text{NCS}^-$

c.  $\text{Cl}^-$

d.  $\text{Br}^-$

e.  $\text{S}^{2-}$

1061. Dietary fiber is a component of plant foods that plays an important role in prevention of gastrointestinal diseases. What polysaccharide is a primary component of plant cell walls?

a. Chitin

b. Starch

c. Chondroitin sulfate

d. Glycogen

e. Cellulose

1062. Transformation  $\text{C}_2\text{H}_4$  (alkene)  $\rightarrow$   $\text{C}_2\text{H}_6$  (alkane) occurs during the following reaction:

a. Dimerization

b. Dehydration

c. Dehydrogenation

d. Hydrogenation

e. Hydration

1063. Blood test is as follows: erythrocytes -  $1,5 \cdot 10^{12}/\text{l}$ ; hemoglobin - 60 g/l; blood color index - 1,4; leukocytes -  $3,0 \cdot 10^9/\text{l}$ , thrombocytes -  $1,2 \cdot 10^{10}/\text{l}$ , reticulocytes - 0,2%. Blood smear revealed Jolly bodies, Cabot rings, megalocytes. What type of anemia does the patient have?

a. Hypoplastic anemia

b. Iron refractory anemia

c. Hemolytic anemia

d. Iron deficiency anemia

e. B<sub>12</sub> and folic acid deficiency anemia

1064. Chloromethane is used in medicine as a local anesthetic. In the manufacturing of certain medicines, it is an intermediate product of the technological chain. What compound is formed as a result of alkaline hydrolysis of chloromethane according to the scheme given below?

$\text{CH}_3\text{-Cl} + \text{NaOH} \rightarrow \text{H}_2\text{O} \quad ?$

a. Sodium formate

b. Ethane

c. Methane

d. Methanal

**e. Methanol**

1065. A doctor has prescribed a nonsteroidal anti-inflammatory drug to relieve inflammation and pain syndrome. Name this drug:

**a. Diclofenac sodium**

- b. Calcium chloride
- c. Prednisolone
- d. Glibenclamide
- e. Loratadine

1066. A patient with essential hypertension has elevated plasma renin levels. What pharmacological group of medicines is preferable in the treatment of this patient?

**a. Calcium ion antagonists**

**b. ACE inhibitors**

- c. Alpha-blockers
- d. Sympatholytics
- e. Diuretics

1067. A patient has developed anuria due to a severe blood loss (40% of blood volume). What is the leading mechanism of anuria development in this case?

**a. Decreased number of functional glomeruli**

**b. Increased oncotic blood pressure**

**c. Decreased hydrostatic pressure in the glomerular capillaries**

**d. Increased pressure in the glomerular capsule**

**e. Decreased pressure in the glomerular capsule**

1068. What groups of antibiotics can be classified as beta-lactam antibiotics?

**a. Cephalosporins, monobactams, aminoglycosides**

**b. Penicillins, cephalosporins, tetracyclines**

**c. Cephalosporins, macrolides, aminoglycosides**

**d. Penicillins, cephalosporins, monobactams, carbapenems**

**e. Penicillins, cephalosporins, macrolides, carbapenems**

1069. A woman has chronic heart failure with edema syndrome. Increased aldosterone levels were detected in her blood. What diuretic must be prescribed in this case?

**a. Asparcam**

**b. Furosemide**

**c. Spironolactone**

**d. Theophylline**

**e. Paracetamol**

1070. To stimulate birth activity, a certain neurohypophyseal hormone is used. Name this hormone:

**a. Thyroxine**

**b. Glucagon**

**c. Oxytocin**

**d. Testosterone**

**e. Insulin**

1071. After a stroke the patient should be prescribed a drug that would increase energy transfer in the brain cells and stimulate the central nervous system. Name this drug:

**a. Ketorolac**

**b. Doxylamine**

**c. Phenazepam**

**d. Piracetam**

**e. Phenobarbital**

1072. In the process of systematic analysis there is a need to separate  $PbSO_4$  from mixture of the 3rd analytical group cation sulphates. Which of the following suits most towards this end?

**a. Precipitate recrystallization**

b. Processing precipitate with ammonia solution

**c. Processing precipitate with 30% ammonium acetate solution**

d. Processing precipitate with concentrated sulfate acid

e. Processing precipitate with acetate acid solution

1073. What solution is used to standardize the silver(I) nitrate titrant solution in Mohr's method?

**a. Sodium chloride solution**

b. Potassium dichromate solution

c. Sodium carbonate solution

d. Sodium tetraborate solution

e. Sodium oxalate solution

1074. A Gram stained smear shows large oval violet cells that form pseudomycelium. Name these microorganisms:

**a. Candida fungi**

b. Plasmodium vivax

c. Actinomycetales

d. Penicillium fungi

e. Mucor fungi

1075. With which of the following compounds does propane react under the given conditions?

**a. Br<sub>2</sub>, in the light, 20°C**

b. SO<sub>2</sub> + Cl<sub>2</sub>, in the dark

c. Br<sub>2</sub>, in the dark, 20°C

d. Diluted H<sub>2</sub>SO<sub>4</sub>, 20°C

e. AlCl<sub>3</sub>

1076. During invasive surgery with muscle relaxant applied a patient developed breathing disruption that was normalised by administering proserin. How can this drug interaction be described?

a. Tachyphylaxis

b. Synergism

**c. Antagonism**

d. Cumulation

e. Incompatibility

1077. What electrophilic reagent is used for sulfonation of pyrrole and furan?

a. Concentrated sulfuric acid

b. Diluted sulfuric acid

c. Oleum

**d. Pyridine-sulfur trioxide complex**

e. Mixture of sulfuric acid and nitric acid

1078. Specify the standard solutions that are used in permanganatometry to quantify the oxidants by the residual titration method:

**a. Potassium permanganate, iron (II) sulfate**

b. Potassium iodate, sodium thiosulfate

c. Potassium dichromate, sodium thiosulfate

d. Potassium bromate, sodium thiosulfate

e. Cerium (IV) sulfate, iron (II) sulfate

1079. Name the process of liquid droplets or gas (air) bubbles fusion that occurs when they collide inside a moving medium (liquid, gas), or on the surface of a body:

**a. Coalescence**

b. Coagulation

c. Aggregation

d. Sedimentation

e. Electrophoresis

1080. Nitritometry is used to determine primary aromatic amines. What indicator is used in the

process?

**a. Tropaeolin 00**

- b. Potassium chromate
- c. Methyl orange
- d. Eosin
- e. Phenolphthalein

1081. Bactericidal drug rivanol contains the following heterocyclic structure:

- a. Isoquinoline
- b. Phenanthrene
- c. Quinoline
- d. Anthracene

**e. Acridine**

1082. After ischemic stroke the patient was prescribed a drug to improve his intellectual functioning and memory. What drug would he obtain in the pharmacy?

- a. Tabex (Cytisine)
- b. -
- c. Diphenin (Phenytoin)

**d. Piracetam**

e. Metoclopramide

1083. Increased concentration of active oxygen forms is a mechanism of pathogenesis in a number of diseases. To prevent this process, antioxidants are prescribed. Select an antioxidant from the list below:

**a. alpha-tocopherol**

- b. Glucose
- c. Glycerol
- d. Cobalamine
- e. Calciferol

1084. A woman is to be prescribed a narcotic analgesic for labor pain relief. What drug is indicated in this case?

**a. Promedol (Trimeperidine)**

- b. Fentanyl
- c. Papaveretum (Omnopon)
- d. Codeine
- e. Morphine

1085. A woman complains of itching lips; they are reddened and covered in scabs and scales after she had been using new lipstick for two weeks. What allergic reactions result in this kind of disorders?

- a. Anaphylactic
- b. Cytotoxic
- c. Stimulating
- d. Immune complex

**e. Delayed**

1086. Examination of the lower limbs of a 40-year-old patient with coronary artery disease and vascular disease of the lower limbs (obliterating endarteritis) revealed skin pallor and dystrophy, local temperature decrease, sense shock, pain. The patient is likely to have the following disorder of the peripheral blood circulation:

**a. Obstruction ischemia**

- b. Venous hyperaemia
- c. Compression ischemia
- d. Arterial hyperaemia
- e. Angiospastic ischemia

1087. What compound is added along with the murexide indicator to reach pH>12, when detecting calcium cations?

- a. Ammonium hydroxide
- b. Ammoniac buffer
- c. Acetate buffer
- d. Sodium hydroxide**
- e. Urotropin

1088. When studying five herbarium specimens of medicinal plants, it was determined that one of them belongs to Fabaceae family. Which one is it?

- a. Ononis arvensis**
- b. Datura stramonium
- c. Solanum dulcamara
- d. Atropa belladonna
- e. Hyoscyamus niger

1089. What solution has the highest osmotic pressure at the temperature of 298 K?

- a. Sodium benzoate solution
- b. Glucose solution
- c. Aluminum sulfate solution**
- d. Urea solution
- e. Sodium sulfate solution

1090. A man with allergic dermatitis and disturbed sleep came to a doctor. What antihistamine would be optimal in this case?

- a. Dexamethasone
- b. Dimedrol (Diphenhydramine)**
- c. Loratadine
- d. Enterosgel (Polymethylsiloxane polyhydrate)
- e. Ampicillin

1091. The technology of drug production widely uses the phenomena of absorption and ion exchange. Which of the ions will be selectively adsorbed on the surface of a silver chloride crystal from an aqueous solution?

- a.  $\text{NO}_3^-$
- b.  $\text{H}^+$
- c.  $\text{Ag}^+$**
- d.  $\text{Cu}^{2+}$
- e.  $\text{OH}^-$

1092. Select from the list an antiprotozoal drug with an anti-Helicobacter pylori effect.

- a. Isoniazid
- b. Aciclovir
- c. Metronidazole**
- d. Benzylpenicillin sodium salt
- e. Rifampicin

1093. A pharmaceutical manufacture produces a drug, that is an animal antibiotic. Point out this drug among those listed below:

- a. Chloramphenicol
- b. Novobiocin
- c. Gramicidin
- d. Phaseolin
- e. Lysozyme**

1094. Heparin was prescribed as a part of complex therapy for myocardial infarction. This drug belongs to the following group:

- a. Coagulants
- b. Detoxifiers
- c. Vitamin preparations
- d. Hormonal preparations

#### e. Direct anticoagulants

1095. At the beginning of the bacteriological study, microscopy of the studied material was carried out and Gram-positive cocci were detected in it. The cocci were arranged in the clusters that resembled a bunch of grapes. Next, the material was inoculated on a dense nutrient medium. Why was it done?

a. To study the cultural properties

**b. To obtain isolated colonies**

c. To study the antigenic properties

d. To obtain the pure culture

e. To study the biochemical properties

1096. The Embryophyta subkingdom (higher plants) includes mainly terrestrial organisms, represented by various life forms (grasses, shrubs, subshrubs, trees, etc.). What division of higher plants includes only shrubs and trees?

a. Polypodiophyta

b. Magnoliophyta

c. Lycopodiophyta

**d. Pynophyta**

e. Bryophyta

1097. Name the state of colloidal particles that has zero electrokinetic potential and can be characterized by the absence of directed movement of the granules in the electric field.

a. Compensated

b. Neutral

**c. Isoelectric**

d. Neutralized

e. Electroneutral

1098. Conducting tissue cells are live and connected to the sieve tube elements. It is characteristic of:

**a. Companion cells**

b. Vessels

c. Collenchyma

d. Tracheids

e. Sclerenchyma

1099. Catalysts are widely used in production of drugs. How can reaction acceleration in the presence of a catalyst be explained?

a. Molecule speed increases

b. Activation energy increases

**c. Activation energy decreases**

d. Total collision frequency increases

e. Collision frequency decreases

1100. A patient presents with persistent fever, with the difference between evening and morning temperature not exceeding  $1^{\circ}\text{C}$ . What type of fever curve is present in this patient?

a. Intermittent

**b. Continuous**

c. Hectic

d. Remittent

e. Recurrent

1101. Mother of a 10-year-old child came to the pharmacy to obtain a drug for prevention of upper respiratory tract infections. What drug would be recommended by the dispensing chemist?

**a. Interferon**

b. Benzoteph

c. Tetracycline

d. Carvedilol

e. Doxorubicin

1102. To quickly stop an attack of angina pectoris, a 55-year-old patient was prescribed an organic nitrate drug. What drug is it?

- a. Octadine (Guanethidine)
- b. Prazosin
- c. Nifedipine
- d. Nitroglycerin**
- e. Labetalol

1103. A patient developed a keloid scar at the site of skin inflammation. This condition is associated with an abnormal course of a certain stage of inflammation. Name this stage.

- a. Proliferation**
- b. Primary alteration
- c. Progression
- d. Exudation
- e. Secondary alteration

1104. Presence of the pathogenic microorganisms in the air can be prognosticated according to the content of sanitary-indicative bacteria. Which bacteria indicate immediate epidemiologic danger?

- a. Yeast fungi
- b. Mold fungi
- c. Sarcinae
- d. Micrococci
- e. Haemolytic streptococci**

1105. What is the name of the single elongated crystals with pointed ends that can be detected during the microscopy of the herbal raw material harvested from a monocotyledonous plant?

- a. Druses
- b. Globoids
- c. Styloids**
- d. Cystoliths
- e. Crystalline sand

1106. A 25-year-old man has an appointment with the dentist. Several minutes after his oral cavity was lavaged with furacilin (nitrofurazone) the patient developed significant labial edema. What type of allergic reaction is observed in this case?

- a. Cytolytic
- b. Anaphylactic**
- c. Stimulated
- d. Delayed-type hypersensitivity
- e. Immune complex

1107. A 62-year-old woman with transmural myocardial infarction has developed heart failure. What is the pathogenetic mechanism of heart failure development in this case?

- a. Volume overload of the heart
- b. Pressure overload of the heart
- c. Myocardial reperfusion injury
- d. Decreased mass of functioning cardiomyocytes**
- e. Acute cardiac tamponade

1108. After a stress, a woman has problems sleeping. What medicine is preferable for the treatment of insomnia in this case?

- a. Aminazine (Chlorpromazine)
- b. Phenobarbital
- c. Barbital
- d. Chloral hydrate
- e. Nitrazepam**

1109. What type of conducting bundle is characteristic of primary anatomical structure of a root?

- a. Concentric

b. Open collateral

**c. Radial**

d. Bicollateral

e. Closed collateral

1110. A patient with tuberculosis developed impaired hearing after a long-term treatment with an antibiotic. What drug had an ototoxic effect in this case?

a. Benzylpenicillin

b. Ceftriaxone

c. Abaktal (Pefloxacin)

**d. Streptomycin**

e. Ampicillin

1111. 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. Didynamous

c. Tetradynamous

**d. Polyadelphous**

e. Diadelphous

1112. During active muscle work, anaerobic glycolysis is the main source of energy, causing the accumulation of lactate in the muscles, the level of which gradually decreases. During what interorgan cycle does the utilization of lactate take place afterwards?

a. Urea cycle

**b. Cori cycle**

c. Krebs cycle

d. Knoop-Lynen cycle

e. Pentose phosphate cycle

1113. Choose the potent fast-acting diuretic to induce forced diuresis:

a. Spironolactone

b. Triamterene

c. Hydrochlorothiazide

d. Acetazolamide

**e. Furosemide**

1114. Any damage to the patient's vessels results in persistent hemorrhage. Blood clotting factor VIII is deficient in the patient's blood. What disease does this patient suffer from?

a. Anemia

b. Thrombocytopenic purpura

**c. Hemophilia**

d. Radiation sickness

e. Acute vascular purpura

1115. What method is used for the quantification of ammonia?

a. Acidimetry, direct titration

**b. Alkalimetry, back titration**

c. Alkalimetry, direct titration

d. Acidimetry, back titration

e. Complexonometry

1116. The stem surface of a woody plant is being studied. It is noted that the cells are parenchymal, dead, with suberized membranes. Therefore, this is:

a. Phelloderm

b. Sclerenchyma fibers

c. Vessels

d. Phellogen

**e. Cork**

1117. In recent decades, the etiological role of viruses in the occurrence of cervical cancer has been proven. Name these viruses.

- a. Herpes simplex virus type 2
- b. Adenoviruses
- c. Human papillomaviruses**
- d. Cytomegalovirus
- e. HTLV-1 and HTLV-2

1118. What drug can be classified as an angiotensin-converting enzyme blocker based on its mechanism of action?

- a. Benzohexonium
- b. Furosemide
- c. Valsartan
- d. Verapamil
- e. Lisinopril**

1119. What integumentary tissue of roots consists of cells with thin cellulose membranes and outgrowths - root hairs?

- a. Phelloderm
- b. Periderm
- c. Periblem
- d. Rhizoderm (epiblem)**
- e. Pleroma

1120. Interaction between dispersed phase and dispersion medium is different for different systems. If dispersed phase has low interaction with medium, the system is called:

- a. Hydrophilic
- b. Bound disperse
- c. Lyophobic**
- d. Lyophilic
- e. Free disperse

1121. Analysis of a sedative herbal tea detects yellow-green infructescences (microstrobiles) formed by bract scales with a tile-like arrangement and small nut-like fruits. What plant can be characterized by such features?

- a. Schizandra chinensis
- b. Alnus glutinosa
- c. Humulus lupulus**
- d. Ephedra distachya
- e. Juniperus communis

1122. Mass fraction of pharmaceutical preparations that contain aromatic amino groups is defined through nitrite titration. What external indicator is used in this case?

- a. Phenolphthalein
- b. Starch-iodide paper**
- c. Methylene red
- d. Eosin
- e. Eriochrome Black T

1123. What type of solutions can be used as infusion solutions?

- a. Hypotonic
- b. Colloid
- c. Isotonic**
- d. Hypertonic
- e. Ideal

1124. What anti-gout drug, based on its mechanism of action, is a urate-lowering agent and a xanthine oxidase inhibitor?

- a. Urodan

- b. Etamide
- c. Urosulfan (Sulfacarbamide)
- d. Allopurinol**
- e. Urolesane

1125. In the course of bronchitis pharmacotherapy a patient has developed dyspeptic disorders, photodermatitis and hepatic failure. What drug can cause such disorders?

- a. Ascorbic acid
- b. Paracetamol
- c. Doxycycline**
- d. Acetylcysteine
- e. Codeine phosphate

1126. During examination a woman presents with enlarged thyroid gland, exophthalmos, increased basal metabolism and heat production, tachycardia, tearfulness, and nervousness. This clinical presentation is characteristic of the following disease:

- a. Hypothyroidism
- b. Thyrotoxicosis**
- c. Cushing's disease
- d. Addison's disease
- e. Diabetes mellitus

1127. A patient with chronic constipation has been prescribed bisacodyl. After 3 weeks of treatment, the patient noticed a reduction of laxative effect. This is caused by the development of the following side-effect:

- a. Habituation**
- b. Dysbacteriosis
- c. Dependence
- d. Cumulation
- e. Sensibilization

1128. What pharmacological effect of acetylsalicylic acid allows its application in patients with ischemic heart disease for prevention of thromboses?

- a. Analgesic
- b. Anti-inflammatory
- c. Antiaggregant**
- d. Antipyretic
- e. Ulcerogenic

1129. A 23-year-old man came to the infectious diseases department with complaints of abdominal distension and diarrhea. He was diagnosed with lamblasis. What type of leukocytosis is characteristic of this disease?

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

1130. Sputum analysis by means of flotation and Ziehl-Neelsen staining technique revealed red long thin bacilli, both isolated and arranged in clusters. What disease is caused by this pathogen?

- a. Actinomycosis
- b. Pertussis
- c. Tularemia
- d. Tuberculosis**
- e. Diphtheria

1131. During harvesting herbal raw materials, a marked mosaicism was noticed on the leaves of medicinal plants. What microorganisms cause this disease?

- a. Protozoa

b. Microscopic fungi

**c. Viruses**

d. Viroids

e. Bacteria

1132. A patient with atherosclerosis was prescribed an antiatherosclerotic agent. Name this drug:

a. Ascorbic acid

b. Piracetam

c. Butadion (Phenylbutazone)

d. Dexamethasone

**e. Fenofibrate**

1133. To identify iodide ions in a solution, a reaction with lead cations was conducted. The obtained precipitate was dissolved in water by means of heating; afterwards the test glass was cooled. What analytical effect could be observed in the process?

a. Blue precipitate

b. Gas bubbles

c. White precipitate

**d. Golden scales**

e. Brown precipitate

1134. A patient with acute cardiac failure was prescribed an adrenoceptor agonist. Name this drug:

a. Salbutamol

b. Metoprolol

**c. Dobutamine**

d. Corglycon (Convallariae glycoside)

e. Digoxin

1135. When activated carbon is included in the combination therapy, the absorption of the other drugs changes in the following way:

**a. Decreases**

b. Remains unchanged

c. Increases

d. Activates

e. Accelerates

1136. Ammonium ions ( $\text{NH}_4^+$ ) must be removed from a mixture during the detection of sodium ( $\text{Na}^+$ ) and potassium ( $\text{K}^+$ ) cations of the first analytical group. Why is it necessary?

a. The solution pH becomes  $<7$ , because of hydrolysis of these ions

b. Ammonium salts decompose at high temperatures

**c. They interfere with the determination of potassium and sodium ions**

d. Compounds with  $\text{K}^+$  and  $\text{Na}^+$  ions form supersaturated solutions

e. The solution pH becomes  $>7$ , because of hydrolysis of these ions

1137. 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. Alcohols

**b. Oxidants**

c. Detergents

d. Dyes

e. Nitrofurans

1138. Emulsions are thermodynamically unstable. In them, the droplets of dispersed phase merge together spontaneously, causing the emulsion to stratify. Name this phenomenon:

a. Contraction

b. Wetting

c. Solubilization

d. Deformation

**e. Coalescence**

1139. *Althaea officinalis* root assumes a marked blue hue on section when processed with methylene blue, which indicates the presence of:

- a. Lipids
- b. Starch
- c. Inulin
- d. Glycogen

e. Mucus

1140. Some medicines are colloidal solutions. Stabilizers are added to them to increase their aggregate stability. What substances are called stabilizers?

- a. Substances that can increase the free energy of a system
- b. Substances that can increase the interfacial tension

c. Substances that can be adsorbed and reduce the interfacial tension

- d. Substances that have no effect on the interfacial tension
- e. Substances that first increase the interfacial tension, and then reduce it over time

1141. A mother with a 6-year-old child came to a local pediatrician. She complains that her child has sore throat and problems with breathing. The doctor suspects laryngeal diphtheria. What external breathing disorder can develop with such localization of the disease?

- a. Rapid, shallow
- b. Slow, deep, with labored expiration

c. Slow, deep, with labored inspiration

- d. Biot respiration
- e. Cheyne-Stokes respiration

1142. A bacillus was obtained from the patient's feces. The bacillus is comma-shaped, mobile, non-spore-forming, and has no capsule. On the solid alkaline medium it grows transparent colonies, on the alkaline peptone water it produces pale blue film in 6 hours. What causative agent can be suspected?

- a. *Escherichia*
- b. *Salmonella*
- c. *Shigella*
- d. *Proteus*

e. *Cholera vibrio*

1143. The products of condensation of aldehydes with hydroxylamine belong to the following class:

a. Hydrazides

b. Aldoximes

- c. Hemiacetals
- d. Hydrazones
- e. Ketoximes

1144. Decarboxylation of histidine amino acid leads to formation of histamine in the cells. What enzyme ensures neutralization of this biogenic amine?

- a. Aminopeptidase
- b. Monoamine oxidase (MAO)

c. Diamine oxidase (DAO)

- d. Aminotransferase
- e. Catalase

1145. On the teeth of a leaf blade, water droplets are excreted through a constantly open gap between two guard cells of the epidermis. This structure is a:

- a. Osmophor
- b. Nectary
- c. Sticky hair

d. Hydathode

e. Glandular hair

1146. Examination of a patient by a neurologist has detected the presence of ataxia in the patient.

What signs are characteristic of this nervous system disorder?

a. Impaired temporal and spatial movement orientation

b. Impaired initiation and planning of movements

c. No movements in the upper limbs

d. No movements in one half of the torso

e. Excessive movements

1147. During the study of home-made canned vegetables, microorganisms that resemble a tennis racket were inoculated on the Kitt-Tarozzi medium. What disease is likely to be caused by these pathogens?

a. Salmonellosis

b. Escherichiosis

c. Botulism

d. Cholera

e. Shigellosis

1148. What types of inflorescence are characteristic of the Cruciferae family?

a. Spadix or panicle

b. Head or corymb

c. Tassel or panicle

d. Head or umbel

e. Corymb or spike

1149. An older patient exhibits low levels of red blood cells and hemoglobin in blood, but the color index is 1.3. Blood smear analysis revealed megaloblasts. What type of anemia is observed in this case?

a. Acquired hemolytic

b. Iron-deficiency

c. Hereditary hemolytic

d. B<sub>12</sub>-folic acid deficiency

e. Chronic posthemorrhagic

1150. Alkaline hydrolysis of esters (complex ethers) is called:

a. Condensation

b. Rearrangement

c. Saponification

d. Etherification

e. Oxidation

1151. A patient with tuberculosis has developed impaired hearing after a long-term antibiotic treatment. What drug has caused such an ototoxic effect in this case?

a. Streptomycin

b. Ceftriaxone

c. Ampicillin

d. Benzylpenicillin

e. Pefloxacin

1152. It is a known fact, that human body in a day synthesizes approximately 80 g of glucose due to gluconeogenesis. What organ performs this process primarily?

a. Skeletal muscles

b. Brain

c. Liver

d. Stomach

e. Heart

1153. The enzymes of medicinal substance metabolism that require monooxygenase reactions of biotransformation are localized in the cells mainly in the:

a. Cytosol

b. Nucleus

- c. Mitochondria
- d. Lysosomes

**e. Microsomes of the endoplasmic reticulum**

1154. During anaerobic glycolysis, ATP synthesis occurs by means of substrate phosphorylation that uses the energy of other macroergic compounds. Name one such compound:

- a. Pyruvate
- b. Lactate
- c. Glucose

**d. Phosphoenolpyruvate**

e. Glucose-6-phosphate

1155. A factory that produces biopreparations adds a 0.3--0.4% formalin solution to a bacterial exotoxin. After that, in 3--4 weeks, a medicine is obtained. This medicine is used for specific disease prevention. What vaccines are made this way?

- a. Live vaccines
- b. Genetically engineered vaccines

**c. Anatoxin vaccines**

- d. Inactivated vaccines
- e. Chemical vaccines

1156. What antibiotic is a drug of choice for treatment of syphilis?

- a. Polymyxin M sulfate
- b. Streptomycin sulfate

**c. Benzylpenicillin sodium salt (Penicillin G sodium salt)**

- d. Lincomycin hydrochloride
- e. Levorin sodium salt

1157. During analysis of a herbal raw material, a culture was grown on a nutrient medium. The culture looks like a black furry plaque. Unseptated mycelial filaments with spherical thickenings at their ends were found in the smear preparations. Name these microorganisms:

a. Candida

**b. Mucor**

- c. Actinomyces
- d. Penicillium
- e. Aspergillus

1158. A 65-year-old patient has been diagnosed with prostate adenoma. What adrenoblocker should he be prescribed?

**a. Doxazosin**

- b. Atenolol
- c. Nifedipine
- d. Propranolol
- e. Metoprolol

1159. Name the initial compound for the synthesis of phthalic acid:

a. 2-Chlorobenzoic acid

**b. o-Xylene**

- c. m-Xylene
- d. 1,2-Dichlorobenzene
- e. Salicylic acid

1160. For eczema treatment, a doctor has prescribed the patient a medicine that must be applied transdermally. What is the maximum number of microbial bodies allowed in 1 g of this product, according to the regulations of the WHO and the Pharmacopoeia?

a. A total of 1000 bacteria and fungi

**b. A total of 100 bacteria and fungi**

- c. 100 bacteria and 50 fungi
- d. 100 bacteria and 100 fungi

e. A total of 500 bacteria and fungi

1161. A woman underwent gastric resection and 5 years later was diagnosed with B<sub>12</sub>-deficiency anemia. What blood cells are typically present in this type of anemia?

- a. Echinocytes
- b. Reticulocytes
- c. Annulocytes
- d. Megalocytes**
- e. Microcytes

1162. Oxytocin was prescribed for a pregnant woman with weak labor activity, who was hospitalized into the maternity ward. What pharmacological group does this drug belong to?

- a. Thyroid hormone preparations
- b. Pituitary hormone preparations**
- c. Anabolic steroids
- d. Mineralocorticoids
- e. Glucocorticoids

1163. After the pus sample taken from the urethra had been inoculated on ascitic agar, it resulted in growth of round transparent colonies. Microscopy of the colonies shows gram-negative kidney bean-shaped diplococci. What causative agent is it?

- a. Pneumococcus
- b. Meningococcus
- c. Gonococcus**
- d. Micrococcus
- e. Streptococcus

1164. The mixture being studied contains  $Mg^{2+}$ ,  $Ni^{2+}$ ,  $Hg^{2+}$  cations. What reagent allows to detect  $Ni^{2+}$  cations in the mixture?

- a. Magneson I (Azo violet)
- b. 1-Nitroso-2-naphthol
- c. Dimethylglyoxime**
- d. Ammonia solution
- e. Alizarin

1165. A 12-year-old boy is of short stature, but his mental development corresponds with that of his age group. What hormone deficiency is the most likely to cause this pathology?

- a. Somatotropin**
- b. Insulin
- c. Oxytocin
- d. Adrenaline
- e. Vasopressin

1166. On day 7 of dimedrol (diphenhydramine) treatment, the patient noted a decrease in the effectiveness of the drug. What pharmacological concept describes the decreased response of the body to a drug?

- a. Idiosyncrasy
- b. Embryotoxicity
- c. Carcinogenicity
- d. Tolerance**
- e. Mutagenicity

1167. A patient with essential hypertension was prescribed a diuretic as a part of complex therapy. This diuretic caused hypokalemia in the patient. Name this diuretic:

- a. Hydrochlorothiazide**
- b. Allopurinol
- c. Amiloride
- d. Triamterene
- e. Spironolactone

1168. Among dosage forms there are numerous disperse systems. Select a free disperse system from the list:

- a. Gel
- b. Jelly
- c. Membrane
- d. Diaphragm

e. Emulsion

1169. "Collargol" pharmaceutical preparation is a colloidal solution of silver that contains a high-molecular compound. What is the function of this compound?

- a. Facilitates sedimentation
- b. Decreases aggregate stability
- c. Induces coagulation
- d. Increases degree of dispersion

e. Increases aggregate stability