

1. Microscopic examination of absorption zone of primary root cortex revealed that it consisted mainly of loose multilayer living parenchyma with amyloid granules. It is called:

- A. Mesoderm
- B. Endoderm
- C. Exoderm
- D. Collenchyme
- E. Phellogene

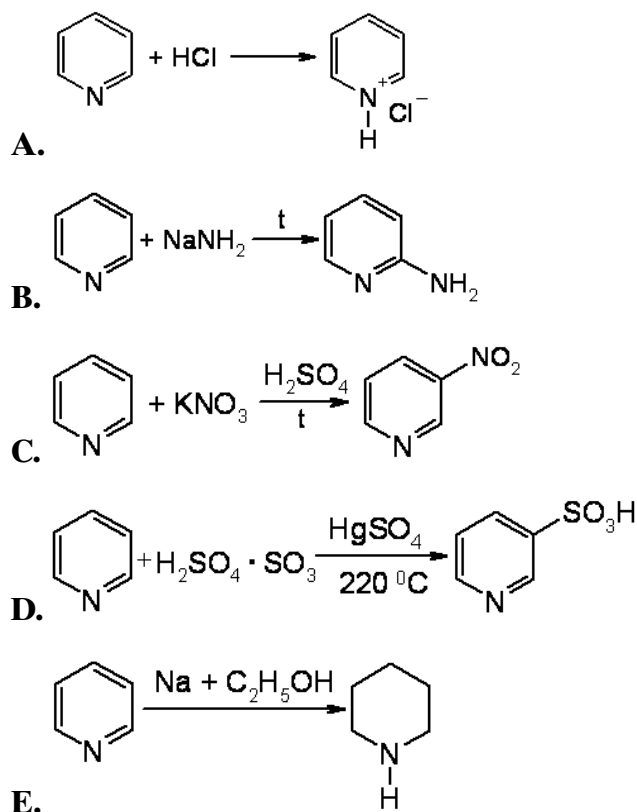
2. An excess of concentrated ammonium hydroxide is a group reagent for the cations of the VI analytical group (acid-base classification) Co^{2+} , Ni^{2+} , Cd^{2+} , Cu^{2+} , Hg^{2+} . In this case the following substances are formed:

- A. Water-soluble ammonia complexes
- B. Hydroxides of acid-soluble cations
- C. Stained, water-insoluble compounds
- D. Hydroxides of alkali-soluble cations
- E. Hydroxides of the cations insoluble in the excess of ammonium hydroxide

3. Both external and internal indicators are used in the following titrimetric method of analysis

- A. Nitritometry
- B. Alkalimetry
- C. Chelatometry
- D. Permanganatometry
- E. Argentometry

4. Which of the listed reactions indicates the basic properties of pyridine?



5. Estimation of temperature of phase transition at different pressures is of great practical importance for modern pharmaceutical industry and can be done by applying:

- A. Clapeyron-Clausius equation
- B. Trouton's rule
- C. Gibbs' phase rule
- D. Mendeleev-Clapeyron equation
- E. Konovalov law

6. A patient with ischemic heart disease has been administered inosine, which is an intermediate metabolite in the synthesis of:

- A. Purine nucleotides
- B. Metalloproteins
- C. Lipoproteins
- D. Glycoproteins
- E. Ketone bodies

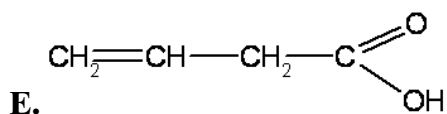
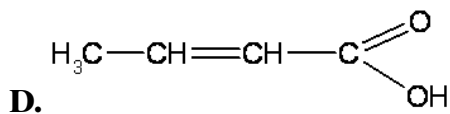
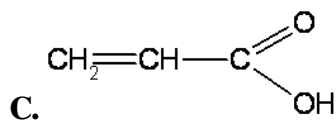
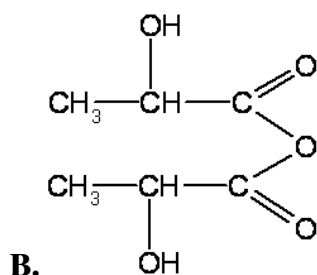
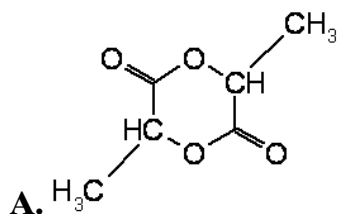
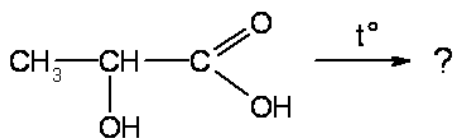
7. Examination of the lower limbs of a 40-year-old patient with coronary artery disease and vascular disease of the lower limbs (obliterating endarteritis) revealed skin pallor and dystrophy, local temperature decrease, sense shock, pain. The patient is likely to have the following disorder of the peripheral blood circulation:

- A. Obstruction ischemia
- B. Compression ischemia
- C. Angiospastic ischemia
- D. Venous hyperaemia
- E. Arterial hyperaemia

8. A patient has been found to have sugar in the urine. Blood glucose is normal. Arterial pressure is normal. What is the mechanism of glycosuria development in this case?

- A. Disturbance of glucose reabsorption in the nephron tubules
- B. Insulin deficiency
- C. Hyperfunction of adrenal medulla
- D. Hyperfunction of thyroid gland
- E. Hyperfunction of adrenal cortex

9. What compound is formed by heating α -hydroxypropionic acid?



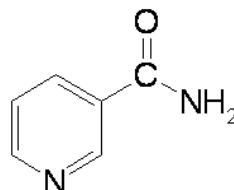
10. Rates of chemical reactions of the same order are compared by:

- A. Constant of chemical reaction rate
- B. Chemical reaction rate
- C. Endpoint of a reaction
- D. Change in the reactants concentration
- E. Change in the concentration of the reaction products

11. Amylolytic enzymes catalyze the hydrolysis of polysaccharides and oligosaccharides. They have an effect upon the following chemical bond:

- A. Glycosidic
- B. Hydrogen
- C. Peptide
- D. Amide
- E. Phosphodiester

12. Which of the following names corresponds with the formula:



- A. Nicotinic acid amide
- B. Isonicotinic acid amide
- C. Picolinic acid amide
- D. Salicylic acid amide
- E. Anthranilic acid amide

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

- A. Methyl orange
- B. Murexide
- C. Methylene blue
- D. Diphenylamine
- E. Ferroin

14. Depressive states can be treated by means of drugs inhibiting the enzyme that inactivates biogenic amines. Specify this enzyme:

- A. MAO (monoamine oxidase)
- B. LDH (lactate dehydrogenase)
- C. CPK (creatine phosphokinase)
- D. AST (aspartate aminotransferase)
- E. ALT (alanine aminotransferase)

15. Solutions of some electrolytes are used as medications. What is the maximum value of the isotonic coefficient for $MgSO_4$ solution?

- A. 2
- B. 4
- C. 3
- D. 5
- E. 7

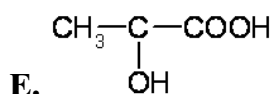
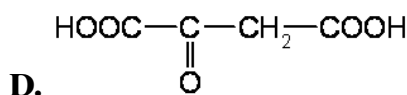
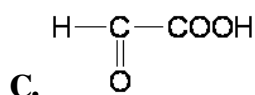
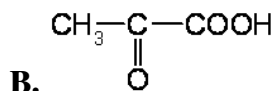
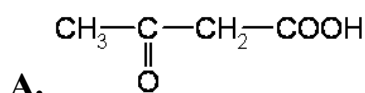
16. What substance blocks the conduction of excitation in the neuromuscular synapses?

- A. Curare
- B. Noradrenaline
- C. Adrenaline
- D. Somatostatin
- E. Aspartate

17. The labels of some medications have an inscription: Shake before use! This warning is caused by:

- A. Sedimentation
- B. Coagulation
- C. Solubility of disperse systems
- D. Insolubility of disperse systems
- E. None of the above

18. Which of these formulas corresponds with acetoacetic acid?



19. Blood serum electrophoresis revealed interferon. This protein is in the following fraction:

- A. γ -globulins
- B. α_1 -globulins
- C. α_2 -globulins
- D. β -globulins
- E. Albumins

20. Proteolytic enzymes of gastric juice exhibit maximum activity in the medium with the following pH:

- A. pH 3,2-3,5
- B. pH 6,5
- C. pH 7,0
- D. pH 9,0
- E. pH 0,5-1,0

21. After taking phenacetin a patient developed acute sore throat, body temperature rise. Examination allowed doctors to make a diagnosis of necrotic angina and agranulocytosis. Agranulocytosis can be characterized by a decrease in the amount of the following WBCs:

- A. Neutrophils
- B. Eosinophils
- C. Basophils
- D. Lymphocytes
- E. Monocytes

22. A newborn born to an Rh-negative mother (3rd pregnancy) presents with progressing jaundice, symptoms of CNS excitation, anemia. What type of jaundice is it?

- A. Hemolytic
- B. Parenchymatous
- C. Obstructive
- D. Parasitic
- E. Toxic

23. A plant under examination has papilionaceous flower. This plant belongs in the family:

- A. *Fabaceae*
- B. *Scrofulariaceae*
- C. *Ranunculaceae*
- D. *Lamiaceae*
- E. *Asteraceae*

24. Van't Hoff's rule is used for determining the shelf life of drugs. The temperature coefficient of the rate of most chemical reactions lies within the following range:

- A. 2-4
- B. 2-3
- C. 1-3
- D. 3-4
- E. 1-5

25. In an emergency situation a scuba diver has quickly risen from the depths to the surface, which is against the rule. He is unconscious, presents with respiratory failure and cardiac activity disorder as a result of decompression sickness. What complication may develop in the scuba diver?

- A. Gas embolism
- B. Fat embolism
- C. Air embolism
- D. Cellular embolism
- E. Thromboembolism

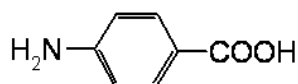
26. A patient has been hospitalized for chronic heart failure. Objectively: skin and mucous membranes are cyanotic, the patient has tachycardia, tachypnea. What type of hypoxia has developed in the patient?

- A. Circulatory
- B. Anemic
- C. Hemic
- D. Tissue
- E. Hypoxic

27. The solid residue obtained after evaporation of the sample solution makes the colorless flame of burner turn yellow, and when watched through a blue glass, it looks purple. What cations are present in the solid residue?

- A. Na^+ , K^+
- B. Ca^{2+} , K^+
- C. Na^+ , Sr^{2+}
- D. Li^+ , Ba^{2+}
- E. Na^+ , Ca^{2+}

28. Amino group of p-aminobenzoic acid is involved into reaction with the following reagent:



- A. HCl
- B. NH_4OH
- C. $NaOH$
- D. CH_3COONa
- E. KCN

29. Urine analysis revealed a decrease in sodium ion concentration. Which hormone provides an enhanced reabsorption of sodium ions in the convoluted nephron tubules?

- A. Aldosterone
- B. Vasopressin
- C. Somatostatin
- D. Adrenaline
- E. Acetylcholine

30. Thermodynamic calculations allow us to determine the possibility and direction of spontaneous processes. In an isolated system the change of the following thermodynamic function is used for

this purpose:

- A. Entropy
- B. Gibbs energy
- C. Helmholtz energy
- D. Internal energy
- E. Enthalpy

31. Histochemical test for fixed oils with sudan III results in the following stain colour:

- A. Pink and orange
- B. Blue and violet
- C. Lemon-yellow
- D. Raspberry-red
- E. Black and purple

32. The strongest acid among the hydrohalic acids is:

- A. Hydroiodic
- B. Hydrofluoric
- C. Hydrochloric
- D. Hydrobromic
- E. -

33. A solution contains cations of zinc and aluminum. Specify the reagent that allows to detect cations of zinc in this solution:

- A. Potassium hexacyanoferrate (II) solution
- B. Sodium hydroxide solution
- C. Cobalt nitrate $Co(NO_3)_2$
- D. Excess of 6M sodium hydroxide in presence of hydrogen peroxide
- E. Sulfuric acid solution

34. In a solution containing cations of copper (II) and zinc, the copper cations can be identified by means of the excess of the following reagent:

- A. 6M ammonia solution
- B. 2M sulfuric acid solution
- C. 6M potassium hydroxide solution
- D. 2M hydrochloric acid solution
- E. 2M solution of ammonium carbonate

35. Concentration of magnesium sulfate in a drug can be determined by complexometric titration. Choose an indicator to detect the end point of titration:

- A. Chromogen black
- B. Phenolphthalein
- C. Methyl orange
- D. Eosin
- E. -

36. Choose a pair of electrodes for potentiometric pH measurement of a solution:

- A. Glass and silver chloride
- B. Calomel and silver chloride
- C. Quinhydrone and antimonial
- D. Mercury sulphate and silver chloride
- E. Glass and antimonial

37. Microscopic examination of a perennial stem revealed integumentary tissue of secondary origin that was formed as a result of cell division of:

- A. Phellogen
- B. Procambium
- C. Cambium
- D. Pericycle
- E. Protoderma

38. Heart rate of a person at rest is 40/min. What structure is the pacemaker of heart in this man?

- A. Atrioventricular node
- B. Sinoatrial node
- C. His' bundle
- D. His' bundle branches
- E. Purkinje fibers

39. The volume of air exhaled by a healthy person during quiet breathing was measured with a spirometer, it was 0,5 liter. What is this volume called?

- A. Tidal volume
- B. Inspiratory reserve volume
- C. Expiratory reserve volume
- D. Vital capacity of lungs
- E. Residual volume

40. 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. Vasopressin
- B. Oxytocin
- C. Corticotropin
- D. Somatotropin
- E. Thyrotropin

41. The rate of a chemical reaction does not depend on the concentration of the reactants. Specify the order of such reaction:

- A. Zeroth
- B. First
- C. Second
- D. Third
- E. Fraction

42. Sulfonamides are widely used as

bacteriostatic agents. The mechanism of antimicrobial action of sulfonamides is based on their structural similarity to:

- A. Para-aminobenzoic acid
- B. Glutamic acid
- C. Folic acid
- D. Nucleic acid
- E. Antibiotics

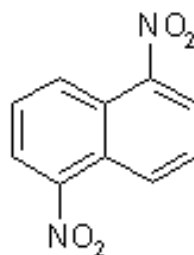
43. Specify the reaction conditions (medium, t°) in the standardization of potassium permanganate solution by sodium oxalate solution:

- A. Acidic, heating
- B. Neutral, heating
- C. Alkaline, heating
- D. Acidic, cooling
- E. Neutral, cooling

44. Which of the acids with the same concentration has the highest ionization degree (α)?

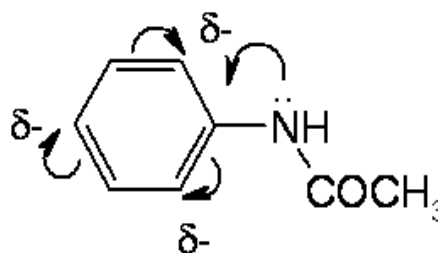
- A. $HCOOH$ $K=1,74 \cdot 10^{-4}$
- B. CH_3COOH $K=1,74 \cdot 10^{-5}$
- C. NH_2CH_2COOH $K=1,70 \cdot 10^{-10}$
- D. C_6H_5COOH $K=6,3 \cdot 10^{-5}$
- E. $NH_2(CH_2)_2COOH$ $K=2,6 \cdot 10^{-11}$

45. Select the correct name for the given compound:



- A. 1,5-Dinitronaphthalene
- B. 1,6-Dinitronaphthalene
- C. 4,8-Dinitronaphthalene
- D. 2,7-Dinitronaphthalene
- E. 4,9-Dinitronaphthalene

46. Acylated amino group acts as a substituent of the following type:



- A. Type I
- B. Type II
- C. Type I and II at the same time
- D. Acetanilide does not take part in the S_E reactions
- E. Impossible to determine

47. Halide ions in drugs are determined by titration based upon the reaction of:

- A. Precipitation
- B. Oxidation-reduction
- C. Substitution
- D. Acid-base
- E. Complexing

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

- A. Ethyl alcohol
- B. Distilled water
- C. Benzene
- D. Chloroform
- E. Amyl alcohol

49. Lithium carbonate is used in medicine for the prevention and treatment of psychoses of different etiology. Li_2CO_3 can react with the following compound:

- A. HCl
- B. $NaCl$
- C. $LiNO_3$
- D. KNO_3
- E. KCl

50. Drugs are commonly analyzed by means of potentiometric pH measurement. Which of the electrodes can be used for measuring the solution pH ?

- A. Glass
- B. Standard hydrogen
- C. Zinc
- D. Calomel
- E. Chlorine-silver

51. The ability of reagent to ensure a stable analytical effect in the interaction with the analyzed substance is characterized by:

- A. Reaction sensitivity
- B. Reaction selectivity
- C. Reaction specificity
- D. Reagent amount
- E. -

52. To maintain a certain value of

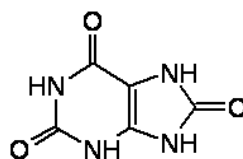
medium- pH the buffer solutions are used. Specify a composition of substances that **DOES NOT HAVE** buffer properties:

- A. $NaOH + NaCl$
- B. $CH_3COOH + CH_3COONa$
- C. $NH_4Cl + NH_3 \cdot H_2O$
- D. $HCOOH + HCOONa$
- E. $NaH_2PO_4 + Na_2HPO_4$

53. What solution can be determined by photolorimetric method by self-absorbance?

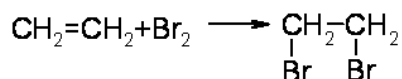
- A. Potassium chromate
- B. Potassium chloride
- C. Potassium sulphate
- D. Potassium nitrate
- E. Potassium phosphate

54. Uric acid is a derivative of:



- A. Purine
- B. Indole
- C. Pyrazine
- D. Pyrazole
- E. Pyridine

55. What class of reactions does this reaction relate?



- A. Addition
- B. Substitution
- C. Reduction
- D. Oxidation
- E. Rearrangement

56. While studying a stem covered with periderm, the researcher realized that gas exchange takes place through ...

- A. Lenticels
- B. Stomata
- C. Pores
- D. Non-suberized (conducting) cells
- E. Hydatodes

57. Which of the ligands is bidentate?

- A. Ethylenediamine
- B. Thiocyanate ion
- C. Cyanide ion
- D. Pyridine
- E. Hydroxide ion

58. An expression for the hydrolysis constant

$$K_g = \frac{K_w}{(K_{acid} \cdot K_{base})}$$

corresponds with the following salt:

- A. $(NH_4)_2S$
- B. $NaCN$
- C. $Fe(NO_3)_3$
- D. Li_2S
- E. NH_4Cl

59. The conversion $MnO_4^- \rightarrow MnO_2$ represents the following reaction:

- A. Reduction in neutral medium
- B. Oxidation in acidic medium
- C. Reduction in acidic medium
- D. Oxidation in alkaline medium
- E. Reduction in alkaline medium

60. The high energy from thermal dissociation of CO molecule (the binding energy of 1075 kJ) results from:

- A. Triple bond between the atoms of oxygen and carbon
- B. Covalent bond
- C. Ionic bond
- D. High polarity of the molecule
- E. Hydrogen bond

61. The sodium-potassium pump functioning in a cell is responsible for the transport of the following ions across the membrane:

- A. Sodium ions out of the cell, potassium ions into the cell
- B. Calcium ions into the cell, potassium ions out of the cell
- C. Sodium ions into the cell, potassium ions out of the cell
- D. Chlorine ions into the cell, potassium ions out of the cell
- E. Sodium ions into the cell, chlorine ions out of the cell

62. In terms of water-air interface, the following substance acts as a surface-active substance:

- A. Valeric acid
- B. HCl
- C. $NaOH$
- D. Urea
- E. -

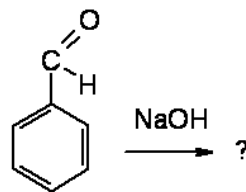
63. A patient consulted a doctor about sunburns, decreased visual acuity. His hair, skin and eyes are not pigmented. He has been diagnosed with albinism. The patient presents with the following enzyme deficiency:

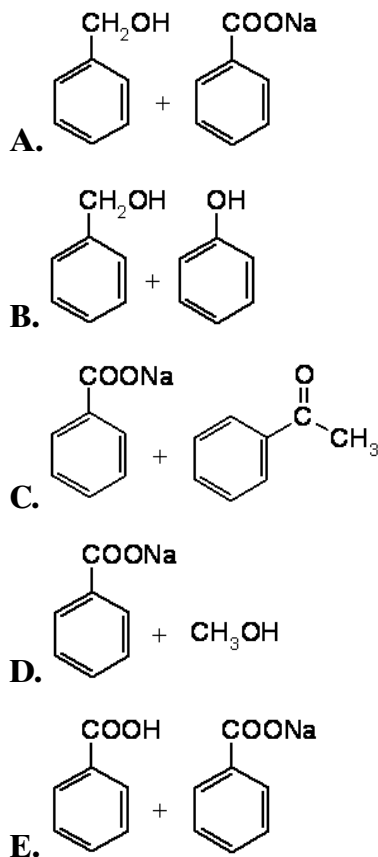
- A. Tyrosinase
- B. Arginase
- C. Carbonic anhydrase
- D. Histidine decarboxylase
- E. Hexokinase

64. The causative agent of botulism causes severe food poisoning. Specify the most characteristic morphological feature of botulism causative agent:

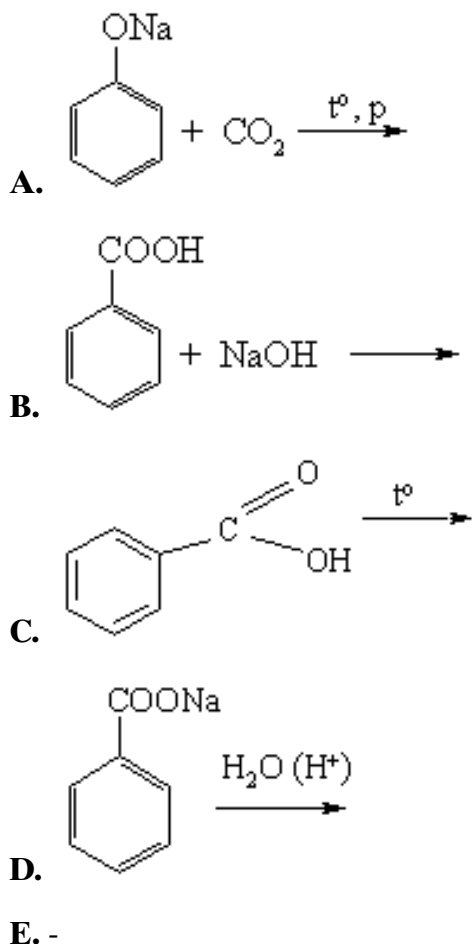
- A. Gram-positive bacillus with subterminal spore
- B. Thick gram-positive non-spore-forming bacillus
- C. Gram-positive bacillus with terminal spore
- D. Thin mobile bacillus with central spore
- E. Thick gram-positive bacillus without spores and flagella

65. After the Cannizzaro reaction for benzaldehyde the following compound is obtained:





66. Specify the reaction, through which salicylic acid can be synthesized:



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

- A. Methionine
- B. Cholesterol
- C. Bilirubin
- D. Glycine
- E. Glucose

68. Alkaline reaction is typical for the solution of the following salt:

- A. Na_2S
- B. Na_2SO_4
- C. KCl
- D. $CuCl_2$
- E. $FeCl_3$

69. Nitrite ions in presence of nitrate ions can be detected by means of:

- A. Crystalline antipyrine in presence of dilute HCl
- B. Crystalline sodium thiosulfate
- C. Dimethylglyoxime
- D. Crystalline iron (III) sulfate
- E. Diphenylcarbazone

70. Which of the following substances relates to colloidal surface-active substances?

- A. Potassium oleate
- B. Iodine
- C. Sodium chloride
- D. Polyethylene
- E. Gelatin

71. The cause of optical activity is the presence of the following organic compound in the molecular structure:

- A. Asymmetric carbon atom
- B. Double bond
- C. Triple bond
- D. Functional group
- E. Plane of symmetry

72. Given the ability of iodine to dissolve in nonpolar solvents, determine the type of chemical bond in an I_2 molecule:

- A. Nonpolar covalent
- B. Ionic
- C. Polar covalent
- D. Metal
- E. Intermolecular interaction

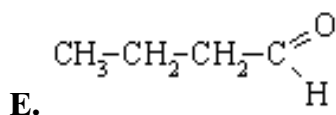
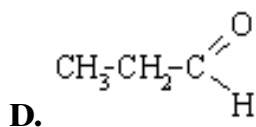
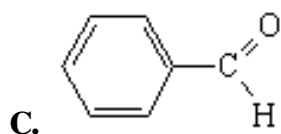
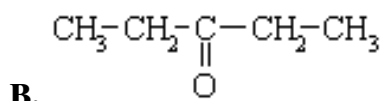
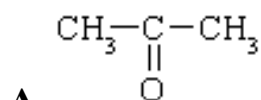
73. Aqueous solution of $CaCl_2$ with mass concentration 10% is used for intravenous injections. What is the maximum value of isotonic coefficient of $CaCl_2$ in an aqueous solution?

- A. 3
B. 4
C. 2
D. 5
E. 1

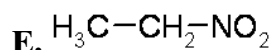
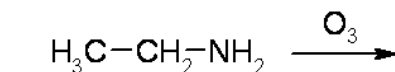
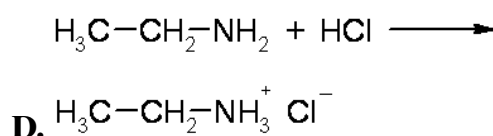
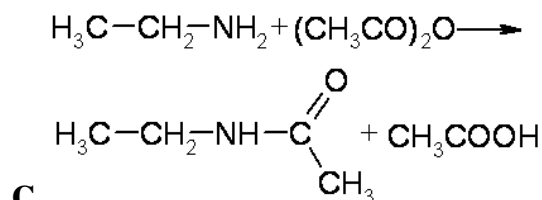
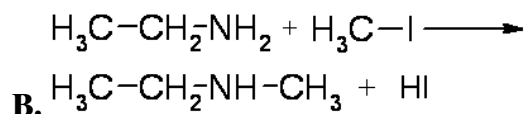
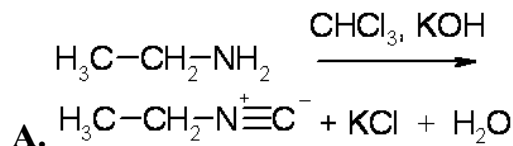
74. Cryoscopic constants of water, benzene, chloroform, acetic acid and camphor equal to 1,86; 5,12; 4,9; 3,9; 40,0 respectively. Which of these solvents should be selected for the most accurate determination of the molar mass of a drug substance (nonelectrolyte) by the cryoscopic method?

- A. Camphor
B. Chloroform
C. Acetic acid
D. Benzene
E. Water

75. Which of the listed carbonyl compounds gives a positive iodoform reaction?



76. Which of these reactions can be used to identify the primary amino group?



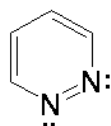
77. For the quantitative analysis of ethanol the gas chromatography was used. Which parameter was measured?

- A. Peak height or area
B. Retention time
C. Retention volume
D. Peak width
E. Peak width at half height

78. Potassium permanganate reacting with hydrogen peroxide in acidic medium acts as:

- A. Oxidant
B. Reductant
C. Disproportionation agent
D. Oxidant and reductant
E. Does not act either as an oxidant, or as a reductant

79. Specify the number of electrons involved into formation of the isolated conjugated system in the pyrimidine molecule:



- A. 6
- B. 4
- C. 10
- D. 2
- E. 8

80. A patient has an increased concentration of hippuric acid in the urine. This acid is the product of benzoic acid detoxification in the liver of. In the human body benzoic acid is formed from the following amino acid:

- A. Phenylalanine
- B. Succinate
- C. Lactate
- D. Aspartate
- E. Malate

81. A group of alpinists climbing to the top had their blood tested. The test revealed erythrocytosis and an increase in hemoglobin rate. What type of hypoxia caused the stimulation of erythropoiesis in the bone marrow?

- A. Hypoxic
- B. Combined
- C. Hemic
- D. Circulatory
- E. Tissue

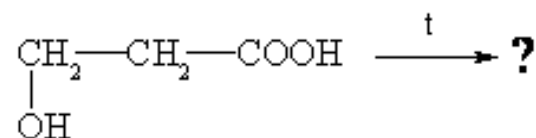
82. Quite often, the soil may contain a number of pathogenic microorganisms. The causative agents of the following disease may exist in the soil for a long time:

- A. Anthrax
- B. Diphtheria
- C. Viral hepatitis
- D. Pertussis
- E. Dysentery

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

- A. Hyaluronidase
- B. Carbohydase
- C. Transferase
- D. Oxidase
- E. Lyase

84. By heating β -hydroxy acids the following substance is formed:



- A. Unsaturated carboxylic acids
- B. Lactones
- C. Lactides
- D. Dicarboxylic acid
- E. Saturated monocarboxylic acids

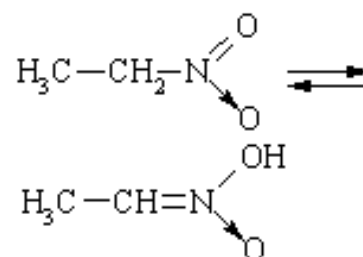
85. The pH of 0,001 M of hydrochloric acid solution is:

- A. 3
- B. 0
- C. 10
- D. 7
- E. 5

86. Which of the listed biologically active compounds inhibits the secretion of pancreatic juice?

- A. Atropine
- B. Acetylcholine
- C. Insulin
- D. Gastrin
- E. Secretin

87. What type of tautomerism is typical for the given compound?



- A. Nitro-aci-nitro tautomerism
- B. Carbonyl-enol tautomerism
- C. Cyclo-oxo tautomerism
- D. Amine-imine tautomerism
- E. Keto-enol tautomerism

88. The molar mass of calcium hydroxide equivalent ($M(\text{Ca}(\text{OH})_2) = 74 \text{ g/mol}$) is:

- A. 37 g/mol
- B. 19 g/mol
- C. 32 g/mol
- D. 74 g/mol
- E. 148 g/mol

89. Bacteriological inspection of disinfection quality at a pharmacy revealed a microorganism in an utility room (in the sink). The microorganism has the following properties: mobile nonspore-forming gram-negative bacteria that form capsular substance, grow well on ordinary nutrient media, secrete the blue-green pigment. This microorganism is most likely to be of the following genus:

- A. *Pseudomonas*
- B. *Proteus*
- C. *Clostridium*
- D. *Shigella*
- E. *Vibrio*

90. Microbiological analysis of medicinal raw materials revealed capsular bacteria. What stain method was used to detect the capsules?

- A. Gin's
- B. Ziehl-Neelsen's
- C. Neisser's
- D. Gram's
- E. Ozheshko's

91. The analyzed plant has hollow ribbed stems, compound umbel inflorescence, schizocarpic fruit (cremocarp) and is rich in essential oils, which is a characteristic of:

- A. *Apiaceae*
- B. *Fabaceae*
- C. *Ericaceae*
- D. *Brassicaceae*
- E. *Asteraceae*

92. Specify the colour of phenolphthalein in the sodium sulfide solution:

- A. Crimson
- B. Colourless
- C. Blue
- D. Yellow
- E. Green

93. In pharmaceutical technology an important part is played by pressure, temperature, concentration. The reaction yield can be increased by lowering the temperature of the following process:

- A. Exothermic
- B. Endothermic
- C. Isochoric
- D. Isobaric
- E. Adiabatic

94. To identify a drug by thin-layer chromatography the following parameter is used:

- A. R_f
- B. n
- C. E, mV
- D. I, A
- E. K_p

95. The intracellular metabolism of glycerol starts with its activation. What compound is formed in the first reaction

of its conversion?

- A. Alpha-glycerol phosphate
- B. Pyruvate
- C. Lactate
- D. Choline
- E. Acetyl coenzyme A

96. When ammonia enters into reaction with acids, this results in formation of ammonium salts. Which properties of ammonia characterize this process?

- A. Ability to accept the hydrogen ions
- B. Reductive properties
- C. Acidic properties
- D. Oxidative properties
- E. Ability to hydrolyze

97. A patient had been diagnosed with right lung cancer and administered surgical treatment. After right-sided pneumonectomy the patient presented with evident dyspnea. What form of respiratory failure has developed in this patient?

- A. Pulmonary restrictive
- B. Central
- C. Peripheral
- D. Pulmonary obstructive
- E. Thoracodiaphragmal

98. What wave of ECG characterizes the spread of excitation throughout the heart atria?

- A. P
- B. R
- C. Q
- D. T
- E. S

99. Cardiac tones are the outer acoustic manifestations of heart functioning. What is the cause of the II tone?

- A. Closure of the semilunar valves
- B. Closure of the cuspid valves
- C. Vibration of the ventricle walls
- D. Vibration of the atrium walls
- E. Chest movements

100. In accordance with the requirements of the pharmacopoeia, the non-sterile medicinal preparations may include microorganisms. What micro-organisms **MUST NOT** be present in them?

- A. Enterobacteria
- B. Ascomycetes
- C. Micrococci
- D. Mold fungi
- E. Sarcinae

101. While performing finger-nose test the examinee could not touch the tip of his nose with his fingertip having his eyes closed. What structure of the central nervous system is damaged?

- A. Cerebellum
- B. Quadrigeminal plate
- C. Cortex
- D. Spinal cord
- E. Thalamus

102. A patient has obstruction of the common bile duct. Which of these substances is usually found in urine in such cases?

- A. Bilirubin
- B. Ketone bodies
- C. Uric acid
- D. Creatinine
- E. Glucose

103. A continuous stay in the mountains causes an increase of blood oxygen capacity. What is the possible reason for this phenomenon?

- A. Development of functional erythrocytosis
- B. Increase of PO_2 rate in the air
- C. Increase of PCO_2 rate in the air
- D. Decrease in respiratory rate and depth
- E. Development of gas acidosis

104. A student had to analyze an axial plant organ characterized by radial symmetry, unlimited growth, positive geotropism. It provided nutrition, vegetative propagation, anchorage of plant in the soil. This organ was identified as ...

- A. Root
- B. Stem
- C. Leaf
- D. Rhizome
- E. Seed

105. A patient presents with fever, chill and cough. From his sputum the ovoid Gram-negative bipolar-stained bacilli with a delicate capsule were isolated. What is the most likely diagnosis?

- A. Plague
- B. Tuberculosis
- C. Leptospirosis
- D. Brucellosis
- E. Toxoplasmosis

106. Choose a name that corresponds to the formula: $CH_3 - C \equiv N$:

- A. Acetic acid nitrile
- B. Acetamide
- C. Acetic anhydride
- D. Acetoxime
- E. Ethyl isocyanide

107. What data is required to determine the activation energy?

- A. Constants of reaction rate at two temperatures
- B. Thermal energy of the reaction
- C. Energy change of the system
- D. Internal energy of the system
- E. Reaction order

108. A patient with systemic lupus erythematosus has developed a diffuse renal affection accompanied by proteinuria, hypoproteinemia, massive edema. What is the mechanism of proteinuria development in this case?

- A. Autoimmune affection of glomeruli
- B. Inflammation of renal tubules
- C. Ischemic affection of tubules
- D. Blood protein increase
- E. Affection of urinary tracts

109. What reactions are used in the methods of permanganometry, dichromatometry, iodometry?

- A. Oxidation-reduction
- B. Precipitation
- C. Complexation
- D. Neutralization
- E. Hydrolysis

110. In order to bind hydrogen ions during the identification of potassium ions with tartaric acid the following solution is used:

- A. Sodium acetate
- B. Sodium hydroxide
- C. Ammonia
- D. Sulfuric acid
- E. Hydrochloric acid

111. According to the Paneth-Fajans rule, the ion preferably adsorbed from a solution on the surface of a solid crystalline adsorbent is the ion, which:

- A. Is included in the crystal lattice of the adsorbent
- B. Is not included in the crystal lattice of the adsorbent
- C. Does not form a sparingly soluble compound with one of the lattice ions
- D. Forms an easily soluble compound with one of the lattice ions
- E. Forms a sparingly soluble compound with one of the lattice ions

112. Some medications are produced by hydrolysis of corresponding neutral salts. From the salts listed below, select the one that **WILL NOT** succumb to hydrolysis:

- A. Na_2SO_4
- B. $NaHCO_3$
- C. $AlCl_3$
- D. $Bi(NO_3)_3$
- E. Na_2SO_3

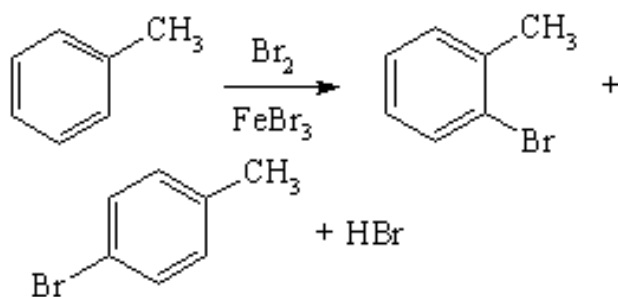
113. Which of the following reactions is required in order to obtain an azo dye out of an aromatic amine?

- A. Diazotization and azo compound
- B. Reduction and diazotization
- C. Diazotization and interaction with potassium cyanide
- D. Salt formation and nitration
- E. Alkylation and nitrosation

114. A solution containing calcium and magnesium cations is titrated with Trilon B solution. Complexometric titration of these cations requires the following medium:

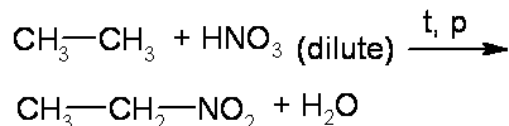
- A. Ammonium buffer solution
- B. Formate buffer solution
- C. Neutral medium
- D. Acidic solution
- E. Acetate buffer solution

115. What is the mechanism of bromination of toluene aromatic nucleus?



- A. S_E
- B. A_E
- C. S_R
- D. S_N
- E. A_N

116. This scheme of nitroalkane synthesis is called the reaction of:



- A. Konovalov
- B. Zinin
- C. Kucherov
- D. Tishchenko
- E. Chichibabin

117. A hospital admitted a patient with arterial hypertension induced by renal artery stenosis, complaints of persistent nausea and headache. The main element in the pathogenesis of hypertension is the activation of the following system:

- A. Renin-angiotensin
- B. Hypothalamic-pituitary
- C. Kallikrein-kinin
- D. Sympathoadrenal
- E. Parasympathetic

118. Nitrating mixture is a mixture of concentrated acids:

- A. $HNO_3 + H_2SO_4$
- B. $H_3PO_4 + H_2SO_4$
- C. $HCl + H_2SO_4$
- D. $HNO_3 + HCl$
- E. $H_3PO_4 + HCl$

119. Bacterioscopic examination of chancre material revealed some mobile, long, convoluted microorganisms with 8-12 regular coils. These features are typical for:

- A. Treponema
- B. Borrellia
- C. Leptospira
- D. Vibrios
- E. Campylobacter

120. Before a surgical operation, a surgeon treated his hands with an alcohol-containing solution. Which group of drugs does this solution relate to?

- A. Antiseptics
- B. Disinfectants
- C. Sterilizing solutions
- D. Detergents
- E. Surface-active substances

121. In order to establish the possible contamination of a medication with fungi, a nutrient medium was inoculated, which resulted in growth of large cream-like colonies. What nutrient medium was used in this case?

- A. Sabouraud
- B. Lowenstein-Jensen
- C. Roux
- D. Loeffler
- E. Finn-2

122. Aniline can be converted into water-soluble salt by treatment with a solution of:

- A. Hydrochloric acid
- B. Sodium hydroxide
- C. Sodium sulfate
- D. Ethanol
- E. Dimethylamine

123. As a rule, the maximum oxidation number of an element is:

- A. Group number in the periodic system
- B. Subgroup number in the periodic system
- C. Period number
- D. Row number
- E. -

124. It is known that some chemical compounds uncouple the tissue respiration and oxidative phosphorylation. Name one of these compounds:

- A. 2,4-dinitrophenol
- B. Carbon monoxide
- C. Antimycin A
- D. Lactic acid
- E. Acetyl-CoA

125. A warmly dressed child has spent a considerably long time out of doors. This resulted in body temperature elevation and general weakness development. What form of thermoregulation disorder is observed in this case?

- A. Exogenous hyperthermia
- B. Endogenous hyperthermia
- C. Fever
- D. Heat shock
- E. Centrogenous hyperthermia

126. A patient with pneumosclerosis

has blood pH at the rate of 7,34. Analysis of gas formula of blood showed hypercapnia. Urine analysis revealed an acidity increase. What form of acid-base disbalance is the case?

- A. Gaseous acidosis
- B. Secretory alkalosis
- C. Gaseous alkalosis
- D. Non-gaseous alkalosis
- E. Non-gaseous acidosis

127. The study of the main root ontogenesis shows that it has developed from:

- A. Radicle
- B. Apical meristem
- C. Pericycle
- D. Lateral meristem
- E. Intercalary meristem

128. The end product of starch hydrolysis is:

- A. D-glucose
- B. D-fructose
- C. Saccharose
- D. Maltose
- E. D-galactose

129. What reagent can help to distinguish between starch and glucose?

- A. I_2
- B. Br_2
- C. $KMnO_4$
- D. $K_2Cr_2O_7$
- E. $FeCl_3$

130. Which of the following solutions with the same molar concentration has the maximum osmotic pressure?

- A. Aluminum nitrate
- B. Glucose
- C. Sodium chloride
- D. Magnesium sulfate
- E. Potassium iodide

131. Pharmacopoeia test reaction for determination of benzoate ions is the interaction with the following solution:

- A. Iron (III) chloride
- B. Potassium chloride
- C. Resorcinol
- D. Acetic anhydride
- E. Diphenylamine

132. If the amount of high-molecular substance added to the sol is very small, it may not increase but decrease its stability. This phenomenon is called:

- A. Sensibilization
- B. Solubilization
- C. Mutual coagulation
- D. Colloidal protection
- E. Sol habituation

133. In order to increase the inhibitory processes in the CNS the pharmacological agents are used that cause the following process on the postsynaptic membranes:

- A. Hyperpolarization
- B. Depolarization
- C. Afterdepolarization
- D. Activation of sodium channels
- E. Activation of calcium channels

134. A 70-year-old patient has been found to have atherosclerosis of heart and brain vessels. Examination revealed the changes in the lipid profile. Pathogenesis of atherosclerosis is greatly influenced by an increase in the following lipoproteins rate:

- A. Low-density lipoprotein
- B. Very-low-density lipoproteins
- C. Intermediate-density lipoproteins
- D. High-density lipoprotein
- E. Chylomicrons

135. *Calendula officinalis* which a representative of the aster family is characterized by the following inflorescence type:

- A. Flowerhead
- B. Umbel
- C. Catkin
- D. Glome
- E. Cyme

136. Which medicinal plant of the *Asteraceae* family has only disk flowers in the flowerhead?

- A. Three-part beggarticks (*Bidens tripartita*)
- B. Dandelion (*Taraxacum officinale*)
- C. Echinacea purpurea
- D. Cornflower (*Centaurea cyanus*)
- E. Common yarrow (*Achillea millefolium*)

137. After eating strawberries a child presented with itchy red spots on the skin (hives). According to the classification of Coombs and Jell this reaction relates to the following type of allergic reactions:

- A. Reagin (anaphylactic)
- B. Cytotoxic
- C. Immunocomplex
- D. Cell-mediated
- E. Stimulating

138. When determining the changes in membrane permeability during an action potential it was established that during the depolarization phase the following movement predominates:

- A. Movement of Na^+ into the cell
- B. Movement of Na^+ out of the cell
- C. Movement of K^+ into the cell
- D. Movement of K^+ out of the cell
- E. Movement of Cl^- into the cell

139. Spore and pollen analysis revealed in the pollen some tetrahedral spores with a semi-circular base and a reticular surface, which may belong to:

- A. *Lycopodiophyta*
- B. *Equisetiphyta*
- C. *Bryophyta*
- D. *Polypodiophyta*
- E. *Pinophyta*

140. 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. *Centaurea cyanus*
- B. *Gnaphalium uliginosum*
- C. *Arnica montana*
- D. *Echinops ritro*
- E. *Bidens tripartita*

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

- A. $AgNO_3$ and NH_4SCN
- B. H_2SO_4 and $NaOH$
- C. $Na_2S_2O_3$ and $K(I_3)$
- D. $KMnO_4$ and $KBrO_3$
- E. $HClO_4$ and KOH

142. In which of these reactions hydrogen acts as an oxidizing agent?

- A. $2Na + H_2 \rightarrow 2NaH$
- B. $Cl_2 + H_2 \rightarrow 2HCl$
- C. $CuO + H_2 \rightarrow H_2O + Cu$
- D. $N_2 + 3H_2 \rightarrow 2NH_3$
- E. $F_2 + H_2 \rightarrow 2HF$

143. A perennial herbaceous plant has ascending quadrangular stem and oppositely arranged leaves. The flowers with bilabiate corolla are zygomorphic, bisexual,

arranged in whorls in the leaf axils. The fruit type is coenobium. The described medicinal plant relates to the following botanic family:

- A. *Lamiaceae*
- B. *Asteraceae*
- C. *Poaceae*
- D. *Brassicaceae*
- E. *Rosaceae*

144. 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. Bifidus bacteria
- B. *Staphylococcus aureus*
- C. *Proteus*
- D. *Providencia*
- E. *Yersinia*

145. The primary structure of nucleic acids is a polynucleotide chain which has a certain composition and order of the nucleotides. What bonds stabilize this structure?

- A. 3',5'-phosphodiester
- B. Peptide
- C. Glycosidic
- D. Disulfide
- E. Amide

146. While determining the type and characteristics of conducting bundles of axial organs one should take into account the positional relation between phloem and xylem and ...

- A. Cambium
- B. Procambium
- C. Collenchyme
- D. Pericycle
- E. Phellogen

147. Growth of some cancer cells is caused by a certain growth factor. Treatment of leukemia involves applying an enzyme that destroys this essential factor. Specify this enzyme:

- A. Asparaginase
- B. Glutaminase
- C. Succinate dehydrogenase
- D. Citrate synthetase
- E. Aspartate aminotransferase

148. Medicinal plants infected by microorganisms cannot be used in the pharmaceutical industry. Invasive

properties of phytopathogenic microorganisms are due to the following enzymes:

- A. Hydrolytic
- B. Isomerase
- C. Transferase
- D. Oxidoreductase
- E. Lyase

149. The medicinal plants growing on a plantations were found to have mosaic patterns on leaves. What microorganisms caused this affection?

- A. Phytopathogenic viruses
- B. Phytopathogenic bacteria
- C. Phytopathogenic fungi
- D. Protozoa
- E. Rickettsiae

150. Bacteria eventually become resistant to antibacterial agents. Resistance of gram-positive bacteria to penicillin antibiotics is caused by:

- A. Beta-lactamase production
- B. Permeability of the cell wall
- C. Active synthesis of peptidoglycan
- D. Active transport of antibiotic
- E. Protein synthesis

151. A 28-year-old male got a burn that caused an increase in spontaneous secretion of gastric juice. It is associated with secretion of the following substance:

- A. Histamine
- B. Secretin
- C. Gastric inhibitory peptide
- D. Cholecystokinin-Pancreozymin
- E. Serotonin

152. Blood pressure is regulated by a number of biologically active compounds. What peptides that enter the bloodstream can affect the vascular tone?

- A. Kinins
- B. Leukotrienes
- C. Enkephalins
- D. Iodothyronines
- E. Endorphins

153. Mycothallus of the fungus under study consists of a stipe, pileus, lamellar hymenophore. This fungus belongs in the class:

- A. Basidiomycetes
- B. Ascomycetes
- C. Zygomycetes
- D. Deuteromycetes
- E. Oomycetes

154. A laboratory received a sample of water used in drug production for sanitary and virological analysis. What group of viruses will indicate faecal contamination of water and thus the need for its additional purification?

- A. Picornaviridae
- B. Herpesviridae
- C. Orthomyxoviridae
- D. Retroviridae
- E. Flaviviridae

155. Specify the indicator of the protective properties of high-molecular compounds of body that promote the keeping of calcium, phosphate and carbonate in blood plasma:

- A. Protective value
- B. Coagulation threshold
- C. Critical micelle concentration
- D. Hydrophilic-lipophilic balance
- E. Volume of sol coagulated by 1 mol of the electrolyte substance

156. After an insulin injection a 45-year-old woman with a long history of diabetes mellitus has developed weakness, paleness, palpitation, anxiety, double vision, numbness of lips and the tip of tongue. Blood glucose is at the rate of 2,5 mmol/l. What complication has developed in the patient?

- A. Hypoglycemic coma
- B. Hyperosmolar coma
- C. Hyperglycemic coma
- D. Hyperketonemic coma
- E. Uremic coma

157. 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. Catkin
- B. Head
- C. Capitulum
- D. Cyme
- E. Panicle

158. Specify the compound with the most pronounced basic properties:

- A. $Bi(OH)_3$
- B. $Sb(OH)_3$
- C. $As(OH)_3$
- D. H_3PO_3
- E. -

159. What is the equivalent of $Al(OH)_3$ in the reaction $Al(OH)_3 + 2HCl = Al(OH)Cl_2 + 2H_2O$?

- A. 1/2 mol
- B. 1/3 mol
- C. 1 mol
- D. 2 mol
- E. 3 mol

160. Food rich in carbohydrates at first increases the blood glucose and then decreases its rate due to the insulin action. What process is activated by this hormone?

- A. Synthesis of glycogen
- B. Gluconeogenesis
- C. Breakdown of glycogen
- D. Breakdown of proteins
- E. Breakdown of lipids

161. A patient has developed megaloblastic anemia on a background of alcoholic cirrhosis. The main cause of anemia in this patient is the following vitamin deficiency:

- A. Folic acid
- B. Lipoic acid
- C. Biotin
- D. Thiamin
- E. Pantothenic acid

162. Inflorescence of greater plantain grows out at apex, the main axis is long, and flowers are sessile. This type of inflorescence is called:

- A. Spike
- B. Panicle
- C. Spadix
- D. Capitulum
- E. Thyrsus

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

- A. White
- B. Yellow
- C. Black
- D. Green
- E. Red

164. A patient was found to have an increased blood serum LDH-1 activity. In which organ is the pathological process localized?

- A. Heart
- B. Liver
- C. Kidneys
- D. Stomach
- E. Muscles

165. Diaphoretic herbal tea includes dichasial cymes with light-yellow, oblong, wing-like, squamelliferous perianth. The flowers are fragrant, yellowish. These inflorescences belong to:

- A. *Tilia cordata*
- B. *Viburnum opulus*
- C. *Robinia pseudoacacia*
- D. *Mentha piperita*
- E. *Padus avium*

166. A patient with alcoholic cirrhosis complains of general weakness, dyspnea. He has been found to have decreased blood pressure, ascites, enlargement of superficial veins of the anterior abdominal wall, esophageal varices, splenomegaly. What hemodynamic disorder is observed in the patient?

- A. Portal hypertension
- B. Left ventricular failure
- C. Right ventricular failure
- D. Heart failure
- E. Collapse

167. A patient with tuberculosis has been prescribed some anti-TB preparations. Which of the following chemotherapeutic drugs has an effect on the tuberculosis pathogen?

- A. Ftivazide
- B. Furacilinum
- C. Methisazonum
- D. Sulfadimezinum
- E. Phthalylsulfathiazole

168. What segment of a nephron contains liquid with a maximum concentration of glucose under normal conditions?

- A. Proximal tubules
- B. Medullary thick ascending limb of loop of Henle
- C. Inner medullary portion of thin descending limb of loop of Henle
- D. Distal convoluted tubule
- E. Inner medullary collecting duct

169. Laboratory analysis revealed protein

in the urine of a young man. In what case a healthy person may present a slight proteinuria?

- A. After exercise
- B. In the resting state
- C. During sleep
- D. In the state of psychoemotional excitation
- E. After overeating

170. A male patient was found to have hypovitaminosis *PP*. What amino acid taken with food may partially compensate the vitamin *PP* deficiency?

- A. Tryptophan
- B. Phenylalanine
- C. Valine
- D. Arginine
- E. Methionine

171. 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. Diluted
- C. Highly concentrated
- D. Direct
- E. Reversible

172. Choose a reaction, in which a basic salt is formed:

- A. $Fe(OH)_3 + 2HCl$
- B. $Fe(OH)_3 + 3KCl$
- C. $2NaOH + H_2SO_4$
- D. $KOH + H_2SO_4$
- E. $NaOH + HCl$

173. Ammonia solution has been added to the solution under examination. A black precipitate fell out. This indicates the presence of the following cations in the solution:

- A. Mercury (I)
- B. Copper (II)
- C. Iron (III)
- D. Iron (II)
- E. Silver (I)

174. The causative agents of intestinal infections can grow at refrigerator temperatures, which may cause infection in people. What type of temperature optimum do these microorganisms relate to?

- A. Psychrophilic
- B. Mesophilic
- C. Thermophilic
- D. Anthropophilic
- E. Necrophilic

175. What type of conducting bundles is characteristic of all root zones of one-seeded plants?

- A. Radical
- B. Central phloem
- C. Central xylem
- D. Bilateral
- E. Collateral

176. A man who had been struck in the epigastric region had a heart arrest. What caused such changes in the cardiac activity?

- A. Increased vagal tonus
- B. Adrenaline release
- C. Increased sympathetic tonus
- D. Angiotensin II release
- E. Histamine release

177. A 45-year-old patient with a gastric ulcer needs the reduction of HCl secretion. Which drug provides this effect due to inhibition of the proton pump?

- A. Omeprazole
- B. Atropine
- C. Quamatel
- D. Benzohexonium
- E. Proglumide

178. When chyme enters the duodenum, it stimulates the secretion of gastrointestinal hormones. Which hormone is responsible for release of enzymes being included in digestive juices?

- A. Cholecystokinin-pancreozymin
- B. Secretin
- C. Glucagon
- D. Somatostatin
- E. Calcitonin

179. Loop of Henle is involved in the mechanism of urine formation. What process takes place in its descending portion?

- A. Reabsorption of water
- B. Reabsorption of water and electrolytes
- C. Reabsorption of Na^+
- D. Reabsorption of Cl^-
- E. Reabsorption of Ca^{2+}

180. Alkaptonuria is characterized by an excessive urinary excretion of homogenti-

dic acid. Development of this disease is associated with disorder of the following amino acid metabolism:

- A. Tyrosine
- B. Tryptophan
- C. Alanine
- D. Methionine
- E. Asparagine

181. Antidepressants can increase the concentration of catecholamines in the synaptic cleft. What is the mechanism of action of these drugs?

- A. Inhibition of monoamine oxidase
- B. Activation of monoamine oxidase
- C. Inhibition of xanthine oxidase
- D. Activation of acetylcholinesterase
- E. Inhibition of acetylcholinesterase

182. 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. Obligate anaerobes
- B. Facultative anaerobes
- C. Microaerophiles
- D. Obligate aerobes
- E. Capnophiles

183. During a survey of the sanitary state of an environment object perfringens titre was determined. What object was studied?

- A. Soil
- B. Outdoor air
- C. Water from an open water reservoir
- D. Tap water
- E. Indoor pharmacy air

184. According to the Rayleigh equation, the intensity of scattered light is inversely proportional to the wavelength of:

- A. Incident light (fourth power)
- B. Incident light (second power)
- C. Incident light (fifth power)
- D. Incident light (third power)
- E. Incident light

185. Quantitative analysis of zinc salts is performed by method of trilonometry. What indicator is used for this purpose?

- A. Eriochrome black-T
- B. Phenolphthalein
- C. Methyl black
- D. Potassium dichromate
- E. Thymol blue

186. Clinical practice involves measurement of ESR. What are the components of blood plasma that mainly determine the ESR value?

- A. Globulins
- B. Urea
- C. Bilirubin
- D. Inorganic ions
- E. Phospholipids

187. The patient uses a daily basis for several raw eggs, which contain anti-vitamin biotin - avidin. Violations of any phase of lipid metabolism might arise?

- A. Fatty acid biosynthesis
- B. Cholesterol biosynthesis
- C. Lipid absorption
- D. Glycerol oxidation
- E. Lipid transport in blood

188. Aqueous solutions of $CuSO_4$ are used in ophthalmic and urological practice as an antiseptic, astringent and cauterant agent. What is the oxidation number of cuprum in this compound?

- A. +2
- B. +1
- C. 0
- D. +3
- E. -1

189. *Astragalus dasyanthus* has sessile flowers gathered into inflorescences with a short thick axis. This inflorescence is called:

- A. Capitulum
- B. Cyme
- C. Truss
- D. Spike
- E. Head

190. 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. Ag^+
- B. Cu^{2+}
- C. NO_3^-
- D. H^+
- E. OH^-

191. A common species of the *Pinaceae* family is a tall, evergreen, shade-enduring tree. The needles are solid, prickly, quadrangular in cross-section, spirally arranged. This tree is:

- A. *Picea abies*
- B. *Larix sibirica*
- C. *Pinus sylvestris*
- D. *Juniperus communis*
- E. *Ephedra equisetina*

192. Early pregnancy can be detected by using the appropriate test. A positive pregnancy test is based on the presence of the following hormone in urine:

- A. Chorionic gonadotropin
- B. Progesterone
- C. Oestradiol
- D. Prolactin
- E. Oxytocin

193. A patient has developed an attack of bronchial asthma: he has laboured respiration with the frequency of 24-26/min., inspirations take turns with prolonged expirations involving participation of expiratory muscles. What form of respiratory failure has developed in the patient?

- A. Expiratory dyspnea
- B. Cheyne-Stokes
- C. Biot's
- D. Inspiratory dyspnea
- E. Apneustic respiration

194. A 58-year-old male patient was found to have a peripheral circulation disorder with a restricted arterial inflow, paleness of the respective region, drop of partial oxygen pressure in it. This disorder is called:

- A. Ischemia
- B. Arterial hyperemia
- C. Thrombosis
- D. Venostasis
- E. Reperfusion syndrome

195. To prepare 600 g of 10% solution of potassium hydroxide the following amount of potassium must be taken:

- A. 60 g
- B. 0,6 g
- C. 6 g
- D. 10 g
- E. 12 g

196. Half-life (half-reaction) is inversely proportional to the initial concentration

for the reactions of:

- A. Second order
- B. First order
- C. Fraction order
- D. Third order
- E. Zeroth order

197. A male received a radiation dose of 30 Gy. He presents with necrotic angina, disorders of the gastrointestinal tract. Blood tests revealed anemia, leukopenia and thrombocytopenia. What period of acute radiation sickness is observed in the patient?

- A. Height of disease
- B. Primary reactions
- C. Imaginary wellbeing
- D. End of disease
- E. -

198. Examination of the leaf epidermis revealed cells containing cystoliths. Presence of cystoliths is typical for plants of the following family:

- A. *Urticaceae*
- B. *Brassicaceae*
- C. *Fabaceae*
- D. *Solanaceae*
- E. *Papaveraceae*

199. Seroprophylaxis and serotherapy of infectious diseases involves using immune sera. What type of immunity is thus acquired?

- A. Passively acquired artificial immunity
- B. Actively acquired artificial immunity
- C. Actively acquired natural immunity
- D. Passively acquired natural immunity
- E. -

200. Caffeine inhibits phosphodiesterase which converts cAMP to AMP. The most typical feature of caffeine intoxication is the reduced intensity of:

- A. Glycogen synthesis
- B. Protein phosphorylation
- C. Pentose phosphate pathway
- D. Glycolysis
- E. Lipolysis