

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

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

2. A patient has been administered a competitive inhibitor of cholinesterase. Name it:

- A. Proserin
- B. Aspirin
- C. Sodium diclophenac
- D. Indometacin
- E. Allopurinol

3. A 30 year-old patient suffering from pulmonary tuberculosis, has been prescribed isoniazid. Continuous taking of this drug may lead to the deficiency of the following vitamin:

- A. Pyridoxine
- B. Tocopherol
- C. Cobalamin
- D. Ergocalciferol
- E. Retinol

4. Active form of one of the sulphur-containing amino acids can be used as a methyl group donor for the drug methylation. Specify this amino acid:

- A. Methionine
- B. Glycin
- C. Glutamine
- D. Tyrosine
- E. Glutamate

5. A chemist in analytical laboratory needs to standardize solution of sodium hydroxide. What primary standard solution can be applied for this purpose?

- A. Oxalic acid
- B. Acetate acid
- C. Chloride acid
- D. Sodium tatraborate
- E. Sodium chloride

6. A patient has taken a large dose of a barbiturate hypnotic (amytal) that inhibits NAD-dependent dehydrogenase of the respiratory chain. What process running in the mitochondria will be disturbed?

- A. ATP synthesis
- B. Glycogen synthesis
- C. Amino acid synthesis
- D. Lipide synthesis
- E. Glucose synthesis

7. Particles of dispersed phase of an emulsion are deformed and look as polyhedrons. What emulsion is it?

- A. High-concentrated
- B. Concentrated
- C. Diluted
- D. Oil-in water
- E. Water-in-oil

8. A drug which inhibits ATP synthesis in a cell has been used during an experiment. What type of transmembrane transport will be disturbed?

- A. Active
- B. Diffusion
- C. Osmosis
- D. Filtration
- E. Facilitated diffusion

9. Increase in secretion of hydrochloric acid in the stomach of an experimental animal can be provoked by subcutaneous injection of the following gastrointestinal hormone:

- A. Gastrin
- B. Secretin
- C. Cholecystokinin
- D. Somatostatin
- E. Motilin

10. Protein digestion in the stomach is carried out by pepsin secreted in form of an inactive pepsinogen. Pepsinogen is converted to pepsin by the removal of the N-terminal peptide that is provoked by:

- A. Perchloric acid
- B. Sulfuric acid
- C. Acetic acid
- D. Bile acids
- E. Amino acids

11. In order to keep eubiotics viable and stable, frozen microorganisms are dried out under the conditions of high vacuum. This method is called:

- A. Lyophilization
- B. Pasteurization
- C. Tyndallization
- D. Inactivation
- E. Hybridization

12. Cardiac diseases are treated with cocarboxylase preparation. This

preparation is the coenzymatic form of the following vitamin:

- A. B_1
- B. B_6
- C. B_{12}
- D. C
- E. P

13. During starvation the normal rate of glucose in blood is sustained due to the gluconeogenesis stimulation. Which of the following substances can be used as a source for glucose synthesis?

- A. Alanine
- B. Adenine
- C. Ammonia
- D. Nicotinamide
- E. Urea

14. It is known that infectious type B hepatitis is a systemic disease caused by the type B hepatitis virus and characterized by a predominant liver affection. Choose from the below given list the drugs for the etiotropic therapy of this infection:

- A. Acyclovir
- B. Penicillin
- C. Tetracycline
- D. Sulfanilamides
- E. Fluoroquinolones

15. Choose a non-salt-forming oxide from the following compounds:

- A. N_2O
- B. CuO
- C. P_2O_5
- D. SO_3
- E. Na_2O

16. What substance can act as both oxidant and reducer in oxidation-reduction reactions?

- A. SO_2
- B. SO_3
- C. CO_2
- D. PbO_2
- E. CrO_3

17. Oxidative deamination of biogenic amines in the tissues is catalyzed by the following enzyme:

- A. Monoaminoxidase
- B. Aspartate transaminase
- C. Alanine transaminase
- D. Decarboxylase
- E. Acetylcholinesterase

18. Nitrogen (I) oxide (N_2O) is applied for inhalation narcosis. It is obtained by heating of:

- A. NH_4NO_3
- B. NH_3
- C. $Cu(NO_3)_2$
- D. NH_4OH
- E. $NaNO_3$

19. Quantitative determination of pharmaceutical substances can be done by means of acidimetry. Its titrant is the secondary standard solution of hydrochloric acid. According to which compound the precise concentration of hydrochloric acid can be determined?

- A. Sodium tetraborate
- B. Oxalic acid
- C. Potassium dichromate
- D. Sodium thiosulfate
- E. Magnesium sulphate

20. Analysis of a patient's urine revealed increased concentration of the uric acid. The patient was prescribed allopurinol. What is the biochemical mechanism of its action?

- A. Xanthine oxidase inhibition
- B. Cyclooxygenase activation
- C. Desaminase inhibition
- D. Phosphorylase inhibition
- E. Nucleosidase inhibition

21. Physical exercise results in an increase in thermogenesis due to an increase in heat production in the following structure:

- A. Skeletal muscles
- B. Heart
- C. Lungs
- D. Liver
- E. Brain

22. Plant pathogenic microorganisms relate to various groups. Which of them causes diseases of medicinal plants most often?

- A. Fungi
- B. Viruses
- C. Bacteria
- D. Actinomycetes
- E. Micoplasma

23. It is known that proteins, fats and carbohydrates are digested by means of proteases, lipases and amylases, respectively. Which of digestive juices contains all these groups of enzymes enough for digestion?

- A. Pancreatic juice
- B. Saliva
- C. Gastric juice
- D. Bile
- E. Juice of large intestine

24. Colloidal protection is used while manufacturing drug preparations. Name the preparation of colloidal silver protected by proteins:

- A. Protargol
- B. Festal
- C. Enzymtal
- D. Argentum
- E. Collagen

25. It is known that the unconjugated bilirubin being the product of heme catabolism is detoxicated in liver. Which compound is involved into the bilirubin detoxication within the hepatocytes?

- A. Glucuronic acid
- B. Urea
- C. Mevalonic acid
- D. Lactic acid
- E. Glycin

26. An adult presents with systemic arterial pressure at the rate of 160/100 mm Hg. This might be caused by the increased concentration of the following hormone in blood:

- A. Adrenalin
- B. Aldosterone
- C. Glucagon
- D. Cortisol
- E. Thyroxin

27. It is required to diminish pump function of patient's heart. This can be done by means of blockers of the following membrane cytoceptors:

- A. β -adrenoreceptors
- B. Nicotinic cholinoreceptors
- C. Muscarinic cholinoreceptors
- D. α -adrenoreceptors
- E. Dopamine receptors

28. Taking vasopressin resulted in a decrease in diuresis. The reason for it is increased water reabsorption in the following renal tubuli:

- A. Distal convoluted tubuli and receiving tubes
- B. Proximal convoluted tubuli
- C. Henle's loops
- D. Descending limbs of Henle's loops
- E. Ascending limbs of Henle's loops

29. Under conditions of high exterior temperature a ventilating fan can relieve staying in the premises because it intensifies heat emission by means of:

- A. Convection
- B. Liquid evaporation
- C. Heat radiation
- D. Heat conduction
- E. Heat radiation and conduction

30. In the pharmaceutical production processes of drug synthesis take place under different conditions. Entropy stays unchanged in the following process:

- A. Adiabatic
- B. Isothermal
- C. Isochoric
- D. Isobaric
- E. Polytropic

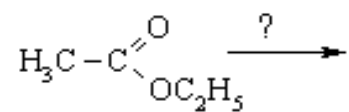
31. Specify the complexing agent for a complex compound $K_2[HgI_4]$:

- A. Hg^{2+}
- B. K^+
- C. I^-
- D. HgI_4^{2-}
- E. $K_2[HgI_4]$

32. Analysis of a patient's urine showed an increase in Na^+ ions concentration and a decrease in K^+ ions concentration. This might be caused by the reduced secretion of the following hormone:

- A. Aldosterone
- B. Insulin
- C. Thyroxine
- D. Hydrocortisone
- E. Prolactin

33. Choose a reagent for synthesis of acetic acid hydrazide from ethyl acetate:



- A. $H_2N - NH_2$
- B. NH_3
- C. $H_2N - CH_3$
- D. $C_6H_5NH_2$
- E. $C_6H_5NHNH_2$

34. When computing quantities of adjuvant substances required to make liquid drug forms isotonic, the values of isotonic quotients are used. What is the quotient for zinc sulphate if known that it dissociates completely in an aqueous solution?

- A. 2
- B. 0
- C. 1
- D. 3
- E. 4

35. After a stomach resection a patient presented with weakness, skin pallor, face puffiness, enlargement of liver and spleen. Analysis of the peripheral blood revealed megaloblasts and megalocytes; hyperchromatism (colour index - 1,3). What type of anaemia is observed in this patient?

- A. B_{12} -deficient
- B. Haemolytic
- C. Hypoplastic
- D. Iron-deficient
- E. Toxic

36. Water-soluble vitamins take coenzyme form in an organism. Thiamine diphosphate is coenzyme of the following vitamin:

- A. B_1
- B. B_2
- C. C
- D. B_6
- E. B_{12}

37. Quantitative determination of calcium chloride is carried out by method of direct chelatometric titration. Choose an indicator for fixation of the titration endpoint:

- A. Eriochrome black T
- B. Phenolphthalein
- C. Methyl red
- D. Eosin
- E. Starch

38. One of the examined soft fruits is characterized by essential-oil exocarp, spongioid mesocarp and overgrown endocarp that consists of juice saccules. What fruit was under examination?

- A. Hesperidium
- B. Pepo
- C. Multicoccus
- D. Drupe
- E. Bacca

39. Enzymes (biological catalysts) are used as pharmacologic preparations. What is the mechanism of enzyme action in the biochemical reactions?

- A. They reduce the energy of reaction activation
- B. They increase the energy of reaction activation
- C. They inhibit the reaction process
- D. They change the constant of the reaction rate
- E. They change the reaction order

40. After a solution had been heated with $(NH_4)_2S_2O_8$ in presence of $AgNO_3$, it turned crimson. What ions were present in the solution?

- A. Mn^{2+}
- B. Fe^{3+}
- C. Fe^{2+}
- D. Co^{2+}
- E. Cu^{2+}

41. A solution under examination was added to the solution of $FeSO_4$ in presence of concentrated H_2SO_4 . Generation of a brown ring indicates presence of:

- A. Nitrate ions
- B. Acetate ions
- C. Carbonate ions
- D. Oxalate ions
- E. Phosphate ions

42. Specify standard substances used for standardization of titrant solutions ($NaOH$, KOH) in the alkalimetric method:

- A. Oxalic and succinic acids
- B. Acetic and succinic acids
- C. Formic and acetic acids
- D. Sulphanilic and oxalic acids
- E. Sulphanilic and salicylic acids

43. Irritation of the sympathetic nerve in an experimental dog induces quantitative and qualitative alterations in the saliva composition. What alterations are induced?

- A. Little saliva, a lot of enzymes
 B. A lot of saliva, a lot of enzymes
 C. Little saliva, few enzymes
 D. A lot of saliva, few enzymes
 E. A lot of saliva, no enzymes

44. Kinetic methods are used for determination of drug stability. What is the order of reaction if its rate constant equals to c^{-1} ?

- A. First
 B. Zero
 C. Fractional
 D. Second
 E. Third

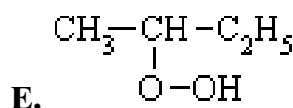
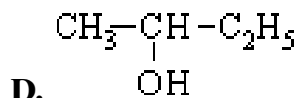
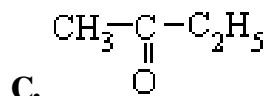
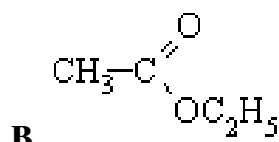
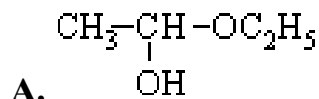
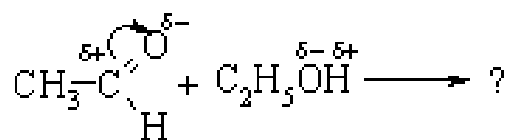
45. Underneath the stem epidermis some layers of living parenchymal cells were found. The cells contained chloroplasts and had cellulose membranes with thickened angles. This tissue is called:

- A. Angular collenchyme
 B. Lacunar collenchyme
 C. Lamellar collenchyme
 D. Storage parenchyme
 E. Chlorophyll-containing parenchyme

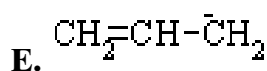
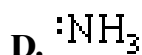
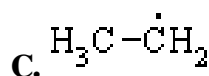
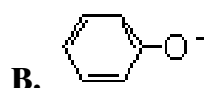
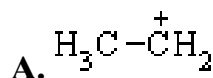
46. Which of the following oxides is the anhydride of nitric acid?

- A. N_2O_3
 B. N_2O_5
 C. N_2O_4
 D. NO
 E. NO_2

47. What is the product of ethyl alcohol-acetic aldehyde reaction?



48. Choose the carbocation among the given intermediate reactive particles:



49. 1 M sulphuric acid solution was added to the solution under study. This resulted in formation of white sediment that was soluble in the alkalies. This indicated that the solution contains:

- A. Plumbum cations
 B. Calcium cations
 C. Barium cations
 D. Argentum cations
 E. Mercury (I) cations

50. Argentum nitrate solution was added to a solution containing anions of the second analytical group. This resulted in formation of light-yellow sediment that was insoluble in the nitric acid and partly

soluble in the ammonia solution. What anions were present in the solution?

- A. Bromide ions
- B. Iodide ions
- C. Chloride ions
- D. Sulphide ions
- E. Arsenite ions

51. A patient has bradycardia, moderate hypotension, decrease of basal metabolism, edemata. What abnormality can induce such syndrome?

- A. Thyroid hypofunction
- B. Parathyroid hypofunction
- C. Thyroid hyperfunction
- D. Parathyroid hyperfunction
- E. Adrenal hypofunction

52. Most cases of alimentary starvation are accompanied by development of evident edemata. What is the leading pathogenetic mechanism of edemata development in this case?

- A. Fall of oncotic pressure of blood plasma
- B. Rise of hydrostatic pressure in the capillaries
- C. Fall of hydrostatic pressure in the tissues
- D. Rise of oncotic pressure in the intercellular fluid
- E. Fall of osmotic pressure in the intercellular fluid

53. A patient suffering from pleuritis underwent pleural puncture. There was obtained a transparent odourless liquid. What type of exudate was obtained?

- A. Serous
- B. Haemorrhagic
- C. Purulent
- D. Fibrinous
- E. Putrefactive

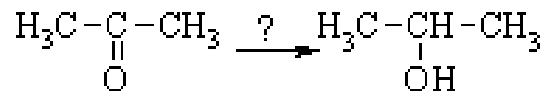
54. Examination of a medicinal plant revealed that its underground organ had nodes, internodes, cataphylls, gemmae and secondary roots. Therefore, this underground organ is:

- A. Rhizome
- B. Storage root
- C. Root bulb
- D. Stolon
- E. Tuber

55. A patient took a maximal deep breath. Air volume being present in lungs under these conditions is called:

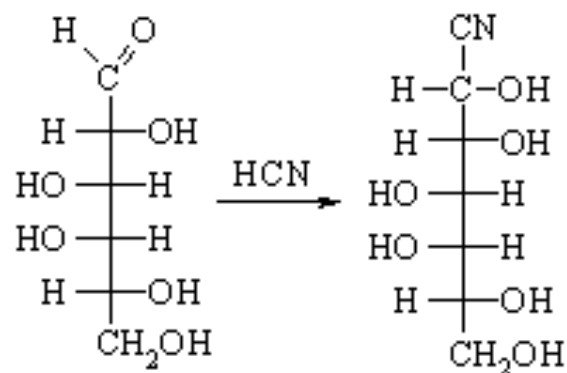
- A. Total lung capacity
- B. Vital lung capacity
- C. Tidal volume
- D. Residual volume
- E. Inspiratory reserve volume

56. Choose a reagent that can be used for production of *propanol - 2* out of acetone:



- A. H_2 (Ni)
- B. CH_3OH
- C. CH_3I
- D. HCN
- E. HCOH

57. Galactose belongs to the aldehyde alcohols and similarly to aldehydes interacts with hydrocyanic acid (HCN) according to the following mechanism:

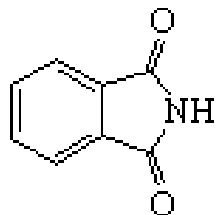


- A. A_N
- B. S_N1
- C. S_N2
- D. A_E
- E. S_R

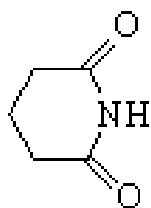
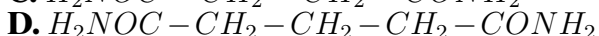
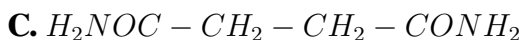
58. Identify the succinimide (succinic acid imide) among the given compounds:



A.



B.

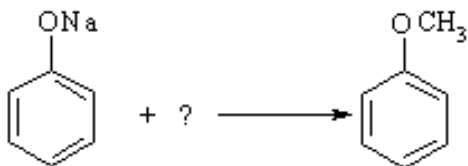


E.

59. Ammonia is generated in different tissues and organs and then transported to liver for detoxication and conversion into urea. What amino acid transports it from skeletal muscles to liver?

- A. Alanine
- B. Histidine
- C. Glycin
- D. Serine
- E. Valine

60. For production of phenol ether it is necessary to cause reaction of sodium phenoxide with:



- A. CH_3Cl
- B. CH_3OH
- C. CH_4
- D. CH_3NH_2
- E. $CH_3C \equiv N$

61. A higher nonvascular plant has distinct alternation of dominant sexual (gametophyte) and reduced asexual (sporophyte) generations. This indicates that the plant belongs to the following di-

vision:

- A. Bryophyta
- B. Lycopsida
- C. Equisetophyta
- D. Pteridophyta
- E. Gymnospermae

62. A fruit under examination is pseudomonocarpic, with woody pericarp and one seed. The seed cuticle remains unfused with the pericarp. Such fruit is called:

- A. Nut
- B. Cremocarp
- C. Achenocarp
- D. Caryopsis
- E. Pseudomonocarpic drupe

63. The birch has compound inflorescences with drooping main axis bearing dichasia composed of unisexual cells. Therefore, this inflorescence is called:

- A. Ament
- B. Raceme
- C. Spadix
- D. Spike
- E. Glomus

64. A female patient bitten by a stray dog came to a surgery. Wide lacerated wounds were localized on the patient's face. What treatment-and prevention aid should be rendered in order to prevent rabies?

- A. Immunization with the antirabic vaccine
- B. Combined antibiotic therapy
- C. Hospitalization, injection of diphtheria-pertussis-tetanus vaccine
- D. Hospitalization, medical surveillance
- E. Urgent injection of normal gamma-globulin

65. It is suspected that the workers of a serum drugs plant at a regional hemotransfusion station are carriers of pathogenic staphylococcus aureus. In order to detect staphylococcus carriage, the material from the nasopharynx of the workers should be inoculated into the following medium:

- A. Egg-yolk-salt agar
- B. Endo agar
- C. Meat infusion broth
- D. Kessler medium
- E. Blood agar

66. Analysis of sputum obtained from a patient with suspected pneumonia

revealed gram-positive diplococci. They were slightly elongated, with the pointed opposite ends. What microorganisms were revealed in the sputum?

- A. *Streptococcus pneumoniae*
- B. *Staphylococcus aureus*
- C. *Klebsiella pneumoniae*
- D. *Neisseria meningitidis*
- E. *Streptococcus pyogenes*

67. Examination of air state in drugstore premises for preparation of injection drugs was done by method of sedimentation. It revealed 5 small roundish colonies with zone of hemolysis around them. Inoculations were made on the following cultural medium:

- A. Blood agar
- B. Endo agar
- C. Meat infusion agar
- D. Egg yolk and salt agar
- E. Lewin's agar

68. According to the Pharmacopoeia requirements, all drugs for topical administration should be tested for "microbiological purity". Inapplicability of this drug group in the medical practice is indicated by presence of the following microorganisms:

- A. *Staphylococcus aureus*
- B. Yeast fungi
- C. Saprophytic staphylococci
- D. Mold fungi
- E. *Sarcinae*

69. A pharmacy produced a batch of vials with glucose diluent for injections. What is the best way for their sterilization?

- A. Autoclave sterilization by flowing steam (fractional method)
- B. Autoclave sterilization under 2 atmosphere pressure
- C. Dry-heat sterilization
- D. X-ray exposure
- E. UV exposure

70. When producing some liquid drug forms, it is necessary to take into account their osmotic pressure. The highest osmotic pressure is characteristic for the 0,1 M solution of the following substance:

- A. $AlCl_3$
- B. Glucose
- C. Saccharose
- D. $CaCl_2$
- E. KNO_3

71. Which of the following indices of the external respiration characterizes the maximum volume of air that a person can exhale after maximum inhalation?

- A. Lung vital capacity
- B. Total lung capacity
- C. Functional residual capacity
- D. Expiratory reserve volume
- E. Respiratory volume

72. The air in a room has increased concentration of carbonic acid. What respiratory changes (depth and rate) will be observed in a person after entering this room?

- A. Increase in respiration rate and depth
- B. Decrease in respiration rate and depth
- C. Decrease in respiration depth and increase in respiration rate
- D. Increase in respiration depth and decrease in respiration rate
- E. There will be no respiratory changes

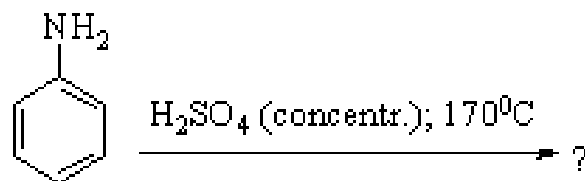
73. Vitamin A is quickly oxidized in the open air and hereupon loses its biological activity. What component of the foodstuffs mainly prevents the oxidation of the vitamin?

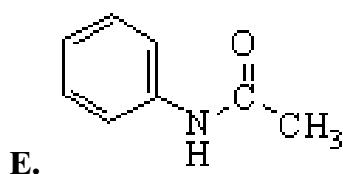
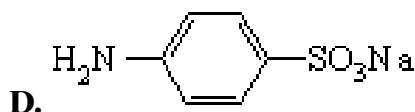
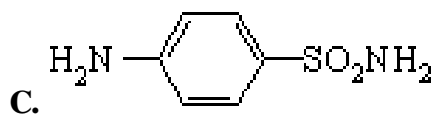
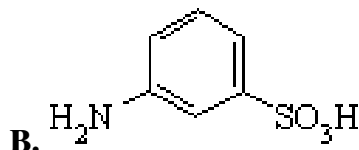
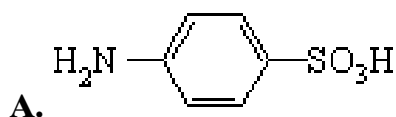
- A. Tocopherol
- B. Nicotinic acid
- C. Common salt
- D. Protein
- E. Fat

74. Specify the standardized solutions used for direct and back titration of reducing agents in the iodometric method:

- A. I_2 , $Na_2S_2O_3$
- B. $K_2Cr_2O_7$, $Na_2S_2O_3$
- C. I_2 , KI
- D. $KMnO_4$, KI
- E. $K_2Cr_2O_7$, I_2

75. By heating aniline with concentrated sulphuric acid the following compound can be obtained:





76. During the quantitative analysis carried out under the primary conditions, a specific reagent to Fe^{3+} cations is $K_4[Fe(CN)_6]$. Their interaction gives a precipitate of the following colour:

- A. Blue
- B. White
- C. Brown
- D. Red
- E. Black

77. From a patient with the symptoms of acute meningitis the spinal fluid was taken. Its smears contained gram-negative diplococci within the leukocytes and outside them. Which microorganism is the most likely cause of the disease?

- A. *Neisseria meningitidis*
- B. *Haemophilus influenzae*
- C. *Streptococcus pneumoniae*
- D. *Candida albicans*
- E. *Escherichia coli*

78. Potentiometric method of pH determination is regarded as the most universal and enters into the National Pharmacopeia of Ukraine. Which electrode is used as a reference electrode?

- A. Saturated calomel
- B. Quinhydrone
- C. Glass
- D. Hydrogen
- E. Zinc

79. Sodium nitrite is used in medicine as a vasodilating drug against stenocardia. $NaNO_2$ acts as reducer with the following compound:

- A. $KMnO_4$
- B. H_2S
- C. NH_3
- D. KI
- E. $NaHCO_3$

80. Most technological processes in pharmaceuticals run in heterogeneous systems. How many phases has an eutectic composition under eutectic temperature of two-component system?

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

81. Sulphur (IV) oxide is a constituent part of one of the most harmful environmental pollutants called toxic smog. When dissolved in water, sulphur (IV) oxide forms the following acid:

- A. Sulphurous
- B. Sulphuric
- C. Hydrosulphuric
- D. Thiosulfate
- E. Tetrathionate

82. Micelle solutions of surfactants are applied in pharmaceutical production as stabilizers and solubilizers. What solution of colloidal surfactants will have the greatest value of critical concentration of micelle formation?

- A. $C_9H_{19}SO_3Na$
- B. $C_{14}H_{29}SO_3Na$
- C. $C_{16}H_{33}SO_3Na$
- D. $C_{12}H_{25}SO_3Na$
- E. $C_{10}H_{21}SO_3Na$

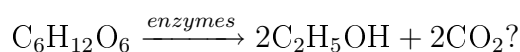
83. In the pharmaceutical industry, the micelle-forming solutions of surface-active substances are used for production of water-soluble preparations out of water-insoluble substances, for example vitamins A and E. The critical concentration of micelle formation has the lowest value in the solutions of the following substances:

- A. $C_{17}H_{35}COONa$
- B. $C_{12}H_{25}COONa$
- C. $C_{13}H_{27}COONa$
- D. $C_{15}H_{31}COONa$
- E. $C_{11}H_{23}COONa$

84. Specify the titration method, in which a standardized titrant solution is gradually added to the solution under study until a titration endpoint is reached:

- A. Direct titration
- B. Back titration
- C. Indirect titration
- D. Substitution titration
- E. Residue titration

85. The given reaction is called:



- A. Alcohol fermentation of glucose
- B. Glucose hydrolysis
- C. Glucose oxidation
- D. Lactic-acid fermentation of glucose
- E. Glucose reduction

86. Which of the following formulas corresponds to the electronic configuration of Cu atom?

- A. $[Ar] 3d^{10} 4s^1$
- B. $[Ar] 3d^9 4s^2$
- C. $[Ar] 3d^6 4s^2$
- D. $[Ar] 3d^8 4s^2$
- E. $[Ar] 3d^7 4s^2$

87. Early pregnancy test involves analysis of a woman's urine. Pregnancy is ascertained by presence of the following hormone:

- A. Chorionic gonadotropin
- B. Estriol
- C. Aldosterone
- D. Testosterone
- E. Progesterone

88. Microbiological assay of a peppermint tincture established its discrepancy with the Pharmacopoeia requirements. It was found to contain pathogenic microflora. The reason for such a conclusion was the presence of the following microflora:

- A. Blue pus bacillus
- B. Yeast fungi
- C. Epidermal staphylococcus
- D. Mold fungi
- E. Micrococci

89. Which electronic configuration of valence electrons is corresponding to an element of the 4th period, VI group, main subgroup?

- A. $4s^2 4p^4$
- B. $4s^1 3d^5$
- C. $6s^2 6p^2$
- D. $6s^2 5d^2$
- E. $3s^2 3p^4$

90. According to the mass action law, velocity of process $2SO_2 (g) + O_2 (g) = 2SO_3 (g)$ is expressed as:

- A. $k [SO_2]^2 \times [O_2]$
- B. $[2SO_2] \times [O_2]$
- C. $k [SO_2] \times [O_2]$
- D. $k [SO_2] + [O_2]$
- E. $[SO_2]^2 + [O_2]$

91. What saturated heated solution is used for transformation of sulphates $BaSO_4$, $SrSO_4$, $CaSO_4$ to carbonates during the systematic analysis?

- A. Na_2CO_3
- B. $CaCO_3$
- C. $(NH_4)_2CO_3$
- D. $MgCO_3$
- E. CO_2

92. Which indicatorless method enables quantitative determination of iron (II) content?

- A. Permanganometry
- B. Chelatometry
- C. Argentometry
- D. Iodometry
- E. Nitritometry

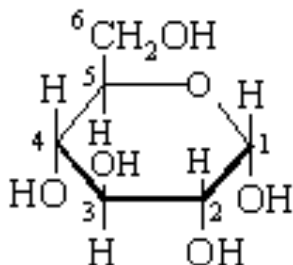
93. Thresholds of coagulation of a drug sol by electrolytes $MgSO_4$, $NaCl$, $Al(NO_3)_3$ are equal to 0,81; 51,0; 0,095 millimole/l correspondingly. Which electrolyte ion has the maximal coagulating effect?

- A. Al^{3+}
- B. Mg^{2+}
- C. Na^+
- D. Cl^-
- E. SO_4^{2-}

94. Iodoform when stored decomposes spontaneously into free iodine. Which thermochemical function is a criterion for this process direction when V and T are constant?

- A. Helmholtz energy F
- B. Entropy S
- C. Enthalpy H
- D. Gibbs energy G
- E. Intrinsic energy U

95. Glycosidic (hemiacetal) hydroxyl in a molecule of α -D-glucose pyranose is bonded to the following carbon atom:



- A. C_1
- B. C_2
- C. C_3
- D. C_4
- E. C_6

96. Microscopic examination of a potato tuber showed some cell inclusions that become blue-violet as affected by Lugol's iodine solution. These inclusions are:

- A. Starch granules
- B. Aleurone grains
- C. Drops of fatty oil
- D. Insulin crystals
- E. Calcium oxalate crystals

97. Chlorophyll, the green pigment of plants, is a chelate compound. Specify the chelating ion in the chlorophyll:

- A. Mg^{2+}
- B. Fe^{3+}
- C. Mn^{2+}
- D. Fe^{2+}
- E. Ni^{2+}

98. Prevailing plants of a foliage forest are monoecious high trees coated with thick dark-grey rind with deep cracks. Their leaves are short-petiolar, pinnatilobate. Their fruit is acorn. Therefore, the dominating species is:

- A. *Quercus robur*
- B. *Robinia pseudoacacia*
- C. *Aesculus hippocastanum*
- D. *Tilia cordata*
- E. *Betula verrucosa*

99. Potassium dichromate $K_2Cr_2O_7$ is applied as oxidant in acidic medium. What is the product of reduction of dichromate-

ion $Cr_2O_7^{2-}$ under these conditions?

- A. Cr^{3+}
- B. $Cr(OH)_3$
- C. $Cr(OH)_2$
- D. $[Cr(OH)_6]^{3-}$
- E. Cr_2O_3

100. Medicinal plants collected at a plantation included a lot of plants with mosaic-coloured leaves. What is the most likely causative agent of such infection?

- A. Phytopathogenic viruses
- B. Phytopathogenic bacteria
- C. Toxic substances of the soil
- D. Microscopic mites
- E. Nematode worms

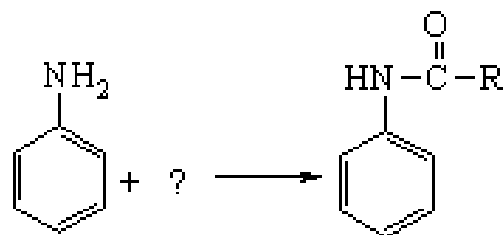
101. A pharmaceutical factory received a batch of crude herbal drugs for phytomedicines production. To evaluate quality of these crude drugs it is necessary to determine:

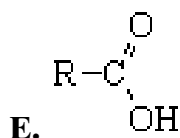
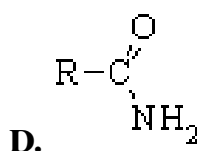
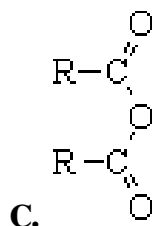
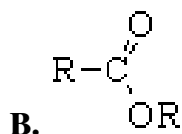
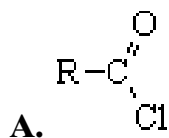
- A. Total number of microorganisms pro 1 g of the crude drug
- B. Coli titer
- C. Coli index
- D. Antimicrobial
- E. Pyrogens

102. The leukocytes that are the first to appear in a focus of inflammation are called:

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

103. The most active component in the aniline acylation reaction is:





104. Staphylococci were isolated in pure culture from a patient with sepsis. These were staphylococci producing betalactamase. Such property should be taken into account when:

- A. Choosing an antibiotic for treatment
- B. Determining biochemical properties
- C. Determining the strain pathogenicity
- D. Differentiating specific types of staphylococci
- E. Choosing optimal conditions for cultivation

105. It is required to determine amount of sodium salicylate in a solution. What titrimetric method can be applied for the quantitative determination of aromatic compounds?

- A. Bromometry
- B. Mercurimetry
- C. Cerimetry
- D. Argentometry
- E. Chelatometry

106. In order to determine mass fraction of calcium in a pharmaceutical preparation, gravimetric method was applied. Ammonium oxalate solution was used as a precipitating agent. What is the gravimetric form in this case?

- A. Calcium chloride
- B. Anhydrous calcium oxalate
- C. Monohydrated calcium oxalate
- D. Calcium carbonate
- E. Calcium hydroxide

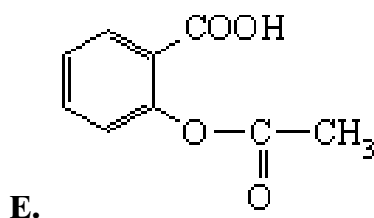
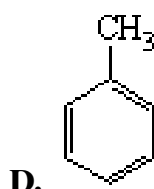
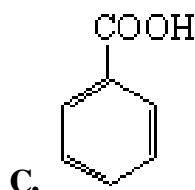
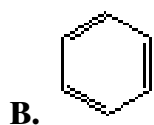
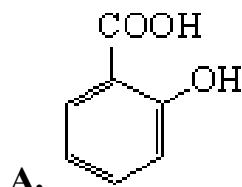
107. A man's tip of tongue was processed with an anesthetic solution. Therefore he will lose the sense of the following taste:

- A. Sweet
- B. Bitter
- C. Sour
- D. Salty
- E. Bitter and salty

108. Anti-inflammatory effect of a number of drugs is caused by the inhibition of arachidonic acid release. This acid is the precursor of:

- A. Prostaglandins
- B. Uric acid
- C. Urea
- D. Haem
- E. Cholesterol

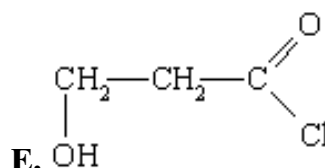
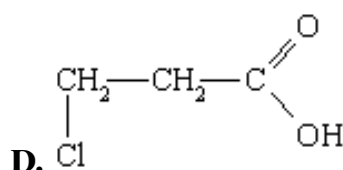
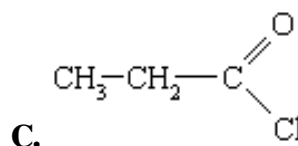
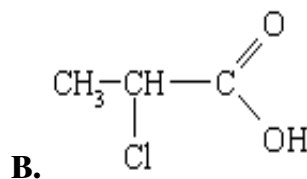
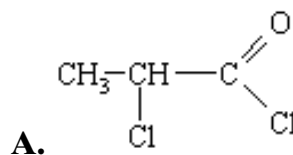
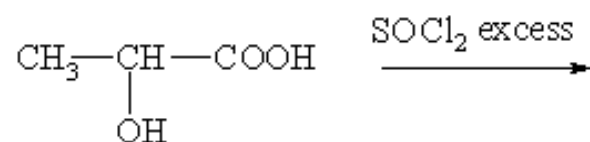
109. Dark-violet colour appears, when FeCl_3 solution is added to the following substance:



110. Inoculation of hen's embryos is the main method of detection of influenza virus. In order to neutralize associated bacterial flora in the material under examination (nasopharyngeal lavage) it is necessary to add beforehand:

- A. Antibiotics
- B. Eubiotics
- C. Fluorescent serum
- D. Leukocytic interferon
- E. Ant-influenza gamma globulin

111. Interaction of lactic acid with $SOCl_2$ excess will result in generation of the following compound:



112. A female patient consulted a doctor about leg pain that arises usually toward the evening; feet and shins edemata. Objectively: leg skin is cyanotic, cold to the touch. What type of peripheral circulation disorder does the patient present with?

- A. Venous hyperaemia
- B. Arterial hyperaemia
- C. Ischaemia
- D. Stasis
- E. Thrombosis

113. A patient 42 year old suffering from chronic calculous cholecystitis complains about acute pain in the right subcostal area, itching and skin icteritiousness, multiple petechial haemorrhages, saponified and light-coloured feces (steatorrhea). What type of icterus is it?

- A. Mechanic
- B. Hemolytic
- C. Parenchymatous
- D. Cythemolytic
- E. Hepatocellular

114. Specify the relevant indicators for fixation of the titration endpoint when usi-

ng nitritometric method:

- A. Tropeolin 00 + methylene blue
- B. Methylene blue
- C. Methylene orange
- D. Starch solution
- E. Diphenylamine

115. 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. Haemolytic streptococci
- B. Sarcinae
- C. Mold fungi
- D. Yeast fungi
- E. Micrococci

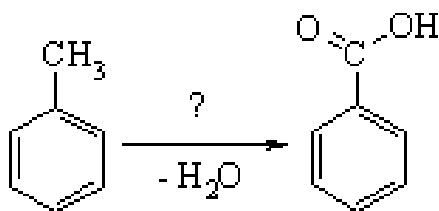
116. To prevent fatty degeneration of liver after viral hepatitis, a patient should be administered lipotropic factors. Indicate one of them:

- A. Choline
- B. Tryptophane
- C. Allopurinol
- D. Contrical
- E. Vicasol

117. Hybridization of one s - and 2 p -orbitals leads to formation of three sp^2 -hybrid orbitals. Specify the angle between these orbitals:

- A. 120°
- B. 180°
- C. 109°
- D. 90°
- E. $104,5^\circ$

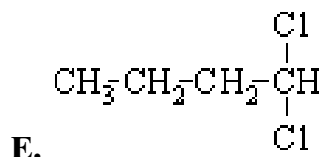
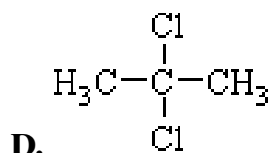
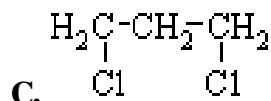
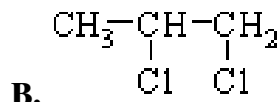
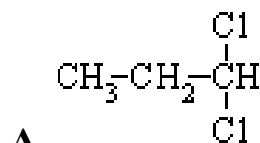
118. Toluol is converted to the benzoic acid under the following conditions:



- A. Oxidation with potassium permanganate
- B. Heating with sulphuric acid
- C. Hydrogen peroxide action at a room temperature
- D. Sodium hydroxide action at a room temperature
- E. Boiling in the open air

119. Which of the following compounds

forms a propionic aldehyde as a result of alkaline hydrolysis (H_2O, OH^-)?



120. During thin-layer chromatography of novocaine, the developed plate represented a stain 3 cm away from the start line, and the length of solvent front was 10 cm. What is the R_f value of novocaine?

- A. 0,3
- B. 0,4
- C. 0,5
- D. 0,6
- E. 0,7

121. For quantitative determination of some drugs the solutions of sulfuric and perchloric acids are applied. Which of the following oxides are the anhydrides of these acids?

- A. SO_3, Cl_2O_7
- B. SO_2, Cl_2O
- C. SO_3, ClO_2
- D. SO_2, Cl_2O_7
- E. SO_2, Cl_2O_7

122. A patient suffers from the cerebral atherosclerosis. Blood count showed hyperlipoproteinemia. You will most likely observe increase in the concentration of the following plasma lipoprotein class:

- A. Low-density lipoproteins
- B. High-density lipoproteins
- C. Chylomicrons
- D. Globulin complexes with steroid hormones
- E. Fatty acid complexes with albumines

123. Inflammatory processes in the gall bladder exert negative influence on the colloidal properties of bile. This may lead to gallstone formation. One of the causes of their formation is the crystallization of the following substance:

- A. Cholesterol
- B. Albumine
- C. Haemoglobin
- D. Urates
- E. Oxalates

124. A 55-year-old woman with renal failure has arterial pressure at the rate of 170/100 mm Hg. Stable pressure rise is caused by hyperactivity of the following system:

- A. Renin-angiotensin-aldosterone
- B. Sympathoadrenal
- C. Hypothalamo-pituitary
- D. Central nervous
- E. Kallikrein-kinin

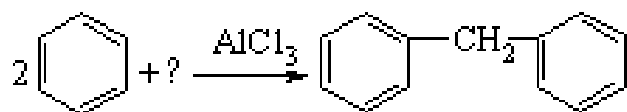
125. What method of titrimetric analysis can be applied for the quantitative determination of sulphuric acid by means of the potassium hydroxide solution?

- A. Alkalimetry
- B. Acidimetry
- C. Oxidation-reduction
- D. Precipitation
- E. Complexation

126. General formula of alkynes is C_nH_{2n-2} . Isomeric alkynes fall into the following compound class:

- A. Alkadienes
- B. Alkenes
- C. Cycloalkanes
- D. Mononuclear arenes
- E. Multinuclear arenes

127. Diphenylmethane can be derived from benzol by means of the following reagent:



- A. CH_2Cl_2
- B. C_2H_5Cl
- C. CH_2O
- D. CH_3COOH
- E. $NaNH_2$

128. Pharmaceutical practice involves use of microheterogeneous systems with liquid disperse medium and solid disperse phase. Such drug form is:

- A. Suspension
- B. Foam
- C. Powder
- D. Aerosol
- E. Emulsion

129. What is the number of degrees of freedom for the salol-camphor system, provided that both components crystallize from the melt simultaneously?

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

130. Choose the reagents for detection of the sulphate ions in a solution containing carbonate, sulphate and phosphate ions:

- A. $Ba(NO_3)_2, HCl$
- B. $Ba(NO_3)^{-2}, NaOH$
- C. $BaCl_2, H_2O$
- D. $CaCl_2, NH_4OH$
- E. $AgNO_3, HNO_3$

131. A big brown alga has a stipe, rhizoids and laminae rich in alginates and iodine. It belongs to the following genus:

- A. *Laminaria*
- B. *Chlorella*
- C. *Chlamydomonas*
- D. *Spirogira*
- E. *Ulothrix*

132. Aetiological factors for the infectious diseases are often microorganisms with various ultrastructure. Which of the following microorganism groups relates to the eucariots?

- A. Protozoa
- B. Viruses
- C. Viroids
- D. Prions
- E. Scotobacteria

133. After a birth trauma a newborn presents with limited movements of the right upper extremity, hyporeflexia, myatropy. These changes relate to the

following type of motor dysfunctions:

- A. Peripheric (atonic) paralysis
- B. Central paralysis
- C. Myasthenia
- D. Bulbar paralysis
- E. Neuritis

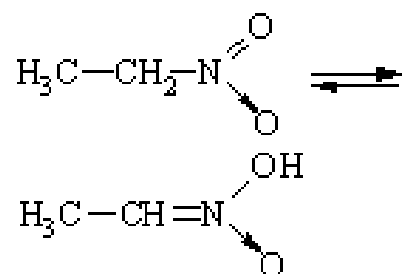
134. Temperature quotient of the reaction velocity is equal to 2. In how many times does the reaction velocity change, if the temperature changes by 40°C ?

- A. In 16 times
- B. In 8 times
- C. In 4 times
- D. In 32 times
- E. In 24 times

135. Surface-active substances are widely used in the drug production. Specify a surface-active substance present at the aqueous solution-air interface:

- A. Butyric acid
- B. Saccharose
- C. NaCl
- D. NaOH
- E. HCl

136. 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

137. Microscopic examination of a ficus leaf revealed in some cells of its epidermis a protrusion of the cell membrane with an accumulation of crystals that dissolve in the hydrochloric acid and release carbonic acid gas. This structure is called:

- A. Cystolith
- B. Raphide
- C. Druse
- D. Single crystal
- E. Styloid

138. Alpha-cells of pancreas stimulate synthesis of the glucagon hormone that is involved into the carbohydrate metabolism. It has the following effect on liver processes:

- A. Activates glycogenolysis
- B. Activates alcoholic fermentation
- C. Inhibits glycogenolysis
- D. Inhibits glycolysis
- E. Activates lipogenesis

139. Sol $\text{Al}(\text{OH})_3$ was derived by processing a freshly made $\text{Al}(\text{OH})_3$ precipitate with a small amount of HCl solution. Sol production bases upon the following phenomenon:

- A. Chemical peptization
- B. Chemical condensation
- C. Rinsing with a solvent
- D. Mechanic dispersing
- E. Physical condensation

140. What is the molecular weight of an undefined gas knowing that its density is 20 relative to the density of hydrogen?

- A. 40 g/mole
- B. 10 g/mole
- C. 20 g/mole
- D. 30 g/mole
- E. 50 g/mole

141. How much sodium hydroxide is required to prepare 500 g of 10% sodium hydroxide solution?

- A. 50 g
- B. 0,5 g
- C. 5 g
- D. 10 g
- E. 25 g

142. A 37-year-old man was admitted to a hospital with an attack of bronchial asthma. What respiration type will be observed in this patient?

- A. Expiratory dyspnea
- B. Inspiratory dyspnea
- C. Apnoea
- D. Gasping respiration
- E. Hyperpnoea

143. After a bacteriological analysis a tableted medication was considered to be inapplicable, though its general microbial contamination was within the norm. The reason for such a conclusion was the presence of the following microorganisms:

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

144. An essential oil plant under examination has a square stem, flowers with bilabiate corolla, coenobium fruit. These characteristics are typical for the following family:

- A. *Lamiaceae*
- B. *Papaveraceae*
- C. *Polygonaceae*
- D. *Solanaceae*
- E. *Scrophulariaceae*

145. Concentration of different ions within the cytoplasm of a neurocyte has been measured during an experiment. The highest ion concentration was observed in:

- A. K^+
- B. Na^+
- C. Cl^-
- D. Ca^{2+}
- E. HCO_3^-

146. Specify the molecular formula of the oxide whose conjugate is permanganic acid:

- A. Mn_2O_7
- B. Mn_3O_4
- C. Mn_2O_3
- D. MnO_2
- E. MnO

147. A patient presents with weakening of the inhibitory processes of CNS which is associated with disturbed production of gamma-aminobutyric acid. What substance is the GABA precursor?

- A. Glutamate
- B. Tryptophane
- C. Methionine
- D. Valine
- E. Glycin

148. Drugs in form of colloidal-and-disperse systems are widely spread in the pharmaceutical practice. What method of sol production is based upon the phenomenon of physical condensation?

- A. Solvent substitution
- B. Reduction
- C. Oxidation
- D. Hydrolysis
- E. Double exchange

149. The best swelling of gelatine will be

observed in the following solvent:

- A. Water
- B. Benzol
- C. Ethyl alcohol
- D. Chloroform
- E. Acetone

150. A patient suffering from the bone marrow form of radiation sickness was found to have the following changes in his hemogram: leukocytes - $2 \cdot 10^9/l$, lymphopenia, erythrocytes - $3,0 \cdot 10^{12}/l$, Hb- 52 g/l, thrombocytes - $105 \cdot 10^9/l$, reduced blood coagulation. These changes are typical for the following stage of the radiation sickness:

- A. Fastigium
- B. Latent period
- C. Prodromal period
- D. Solution
- E. Relapse

151. Immediate-type allergies are characterized by degranulation of the tissue basophils that secrete biologically active substances. One of such substances is:

- A. Histamine
- B. Acetylcholine
- C. Plasminogen
- D. Hageman's factor
- E. Thromboxane

152. A 56-year-old female patient complains about a fast growing hard neoplasm in the mammary gland that appeared a month ago. Objectively: the formation is fused with the surrounding tissues, it is uneven, slightly painful. What are the peculiarities favouring the infiltrative growth of a malignant tumour?

- A. Lack of contact inhibition
- B. Intensified chalone formation
- C. Intensified contact inhibition
- D. Intensified formation of tight contacts
- E. Rise of embryonal antigens

153. During the field practice a student found a plant with disk-shaped structure of its rachis, sessile flowers and husk. This inflorescence is called:

- A. Anthodium
- B. Spike
- C. Spadix
- D. Glomus
- E. Raceme

154. As a result of staining of a plant mi-

crosslide with *Sudan* III solution the cell membranes turned pink. This indicates the presence of:

- A. Suberin
- B. Cellulose
- C. Lignin
- D. Pectin
- E. Hemicellulose

155. After a plant microslide had been processed with phloroglucinol together with concentrated hydrochloric acid, the cell membranes turned crimson red. This indicates presence of:

- A. Lignin
- B. Pectin
- C. Cellulose
- D. Hemicellulose
- E. Suberin

156. Nitritometric determination of compounds containing primary aromatic amino group can be carried out under the following conditions:

- A. With observation of all the mentioned conditions
- B. At a temperature up to 10°C
- C. With adding of the crystalline *KBr* (catalyst)
- D. Chloric acid excess
- E. Slow titration

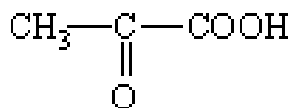
157. What electrode is used as indicator during dichromatometric determination of FeSO_4 in a solution provided that fixation of the equivalence point is done by a potentiometric method?

- A. Platinum
- B. Glass
- C. Quinhydrone
- D. Silver
- E. Silver chloride

158. Inflorescence of *Ledum palustre* has a significantly shortened rachis, connivent nodes, pedicles of the quite similar length. This inflorescence is called:

- A. Umbel
- B. Glomus
- C. Bostryx
- D. Spike
- E. Ament

159. Reaction of pyruvic acid in which the ketone functional group takes place proceeds with the following reagent:

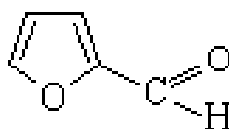


- A. HCN
- B. NaOH
- C. SOCl_2
- D. FeCl_3
- E. $\text{CH}_3\text{OH} (\text{H}^+)$

160. Which of the following compounds has acidophobic properties?

- A. Pyrrole
- B. Pyrazole
- C. Pyridine
- D. Pyrimidine
- E. Imidazole

161. What reagent can demonstrate presence of an aldehyde group in a furfural molecule?



- A. $[\text{Ag}(\text{NH}_3)_2]\text{OH}$
- B. $(\text{CH}_3\text{CO})_2\text{O}$
- C. NaNO_2
- D. NH_3
- E. NaOH

162. A patient present's with Kussmaul's respiration, acetone smell from the mouth; low tonus of eyeballs, myotic pupils, dry skin, polyuria, glycosuria, hyperglycemia. Such symptom complex is typical for the following coma:

- A. Diabetic
- B. Hepatic
- C. Alimentary dystrophic
- D. Hypoglycemic
- E. Adrenal

163. Heart automatism is possible due to the atypical cardiomyocytes forming the cardiac conduction system. What part of this system is the primary cardiac pacemaker?

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

164. Essential oil glandules consisting of 8

secretory cells arranged in two rows and four tiers can be found in most plants of the following family:

- A. *Asteraceae*
- B. *Apiaceae*
- C. *Lamiaceae*
- D. *Rosaceae*
- E. *Scrophulariaceae*

165. To relax skeletal muscles during complex surgeries, curarelike substances are applied. These substances block the following structure:

- A. Neuromuscular synapses
- B. Basal ganglions
- C. Red nuclei of the mesencephalon
- D. Synaptic structures of the spinal cord
- E. Vegetative ganglions

166. Anxious condition can be characterized by reduced salivation and sense of dry mouth. What mediator is exuded out of nerve terminals innervating salivary glands?

- A. Noradrenaline
- B. Acetylcholine
- C. Serotonin
- D. Histamine
- E. GABA

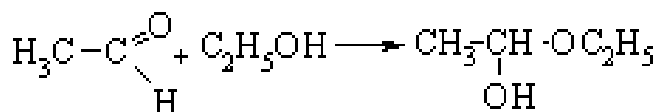
167. A patient complains about an increase in heart rate, hyperperspiration, irritability, sleeplessness. He has been presenting with these symptoms for the latest six months. They indicate the hyperfunction of the following endocrine gland:

- A. Thyroid gland
- B. Pancreas
- C. Adrenal glands
- D. Sexual glands
- E. Thymus

168. What mediator provides information transmission from nerve terminations of motoneurons to the fibers of skeletal muscles?

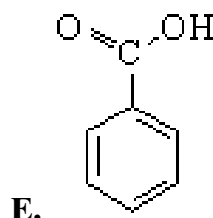
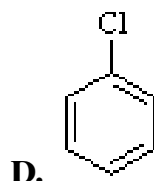
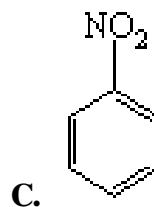
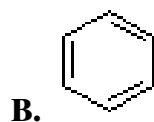
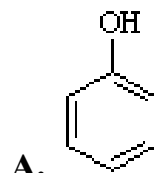
- A. Acetylcholine
- B. Adrenaline
- C. Noradrenaline
- D. Serotonin
- E. GABA

169. What is the mechanism of addition reaction of ethanol to acetaldehyde?



- A. A_N nucleophylic addition
- B. A_E electrophylic addition
- C. S_E electrophylic addition
- D. S_N nucleophylic substitution
- E. S_R radical substitution

170. The highest bromination rate will be observed for the following compound:



171. Examination of five herbarium specimens of medicinal plants showed that one of them belonged to the *legume* family, namely:

- A. *Glycyrrhiza glabra*
- B. *Atropa belladonna*
- C. *Hyoscyamus niger*
- D. *Datura stramonium*
- E. *Solanum dulcamara*

172. Bacca fruit is typical for the following representative of *Solanaceae* family:

- A. *Atropa belladonna*
- B. *Hyoscyamus niger*
- C. *Datura stramonium*
- D. *Nicotiana tabacum*
- E. *Datura innoxia*

173. A patient was found to have an increase in total bilirubin concentration in plasma at the expense of indirect bilirubin; high rate of stercobilin in feces and urine; normal rate of direct bilirubin. What jaundice is it?

- A. Haemolytic
- B. Mechanic
- C. Gilbert's syndrome
- D. Parenchymatous
- E. Physiological

174. A patient has been administered *L*-carnitine. This preparation ensures transmembrane transfer of the following substances:

- A. Higher fatty acids
- B. Amino acids
- C. Purine nucleotides
- D. Pyrimidine nucleotides
- E. Glucose

175. Coordination number of iron in the potassium hexacyanoferrate (II) $K_4[Fe(CN)_6]$ is:

- A. 6
- B. 2
- C. 4
- D. 3
- E. 8

176. A patient is 50 years old. As a result of continuous improper feeding he got hypovitaminosis C. Lesion of connective tissue is caused by low activity of the following enzyme:

- A. Proline hydroxylase
- B. Alanine aminotransferase
- C. Pyruvate carboxylase
- D. Tryptophan hydroxylase
- E. Glutaminase

177. Low rate of vitamin B_6 in the dietary intake leads to disturbance of protein metabolism. What biochemical processes in the patient's organism will become less active?

- A. Transamination
- B. Reduction-oxidation
- C. Phosphorylation
- D. Methylation
- E. Hydrolysis

178. Before diving experienced divers first take several deep breaths. They do it in order to:

- A. Remove as much as possible CO_2
- B. Reduce functional residual capacity of lungs
- C. Increase lung vital capacity (LVC)
- D. Increase total lung capacity (TLC)
- E. Increase respiratory volume (RV)

179. As a result of reaction of mercury excess with diluted nitric acid the following gas will escape:

- A. NO
- B. NH_3
- C. N_2
- D. N_2O
- E. -

180. A 47-year-old patient with an arm injury was delivered to a hospital in pain shock condition. Objectively: the patient is in grave condition, with mental confusion; integuments are moist, pale, acrocyanotic. There are also tachypnea, fall in the arterial pressure, tachycardia. What type of hypoxia is prevailing in this patient?

- A. Circulatory
- B. Haemic
- C. Tissue
- D. Respiratory
- E. Substrate

181. A patient suffering from the essential hypertension presents with an increase in the arterial pressure up to 180/110 mm Hg; dyspnea, cyanosis, tachycardia; heart borders are dilated to the left, in lungs moist rales are present. What signs of urgent compensation for cardiac failure are observed?

- A. Tachycardia
- B. Arterial pressure rise
- C. Cyanosis
- D. Dyspnea
- E. Myogenic dilatation

182. A patient has been suffering from diabetes mellitus for 10 years. He was delivered to a hospital in grave condition. On the 2nd day of treatment his condition grew significantly worse: he lapsed

into a coma, there appeared noisy deep breathing. Deep inspirations took turns with forced expirations with assistance of expiratory muscles. What form of respiration disorder is it?

- A. Kussmaul's respiration
- B. Stenotic respiration
- C. Tachypnea
- D. Cheyne-Stokes respiration
- E. Biot's respiration

183. The product of potassium permanganate reduction in the neutral medium has the following chemical formula and colour:

- A. MnO_2 , brown
- B. MnO_2 , green
- C. K_2MnO_4 , green
- D. K_2MnO_4 , violet
- E. $MnSO_4$, colourless

184. What is maximal valency of nitrogen in consideration of donor-acceptor mechanism of covalent bond?

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

185. Microscopy of a leaf epidermis of *Convallaria majalis* showed that the stomata had four accessory cells. Two of them were lateral, and two other were polar. What type of stomatal mechanism is it?

- A. Tetracytic
- B. Diacytic
- C. Anisocytic
- D. Anomocytic
- E. Paracytic

186. Medical examination of a dairymaid revealed affection of the locomotive system, vision impairment, disorder of the nervous and other systems. To confirm the diagnosis the patient was referred for a serological assay (Wright's reaction) and Burnet's skin allergy test. What was the provisional diagnosis?

- A. Brucellosis
- B. Tularemia
- C. Anthrax
- D. Rheumatism
- E. Leptospirosis

187. Specify the number of degrees of freedom for intersection of the liquidus

line with ordinate axis of the equilibrium diagram of a two-component system:

- A. $C = 0$
- B. $C = 2$
- C. $C = 1$
- D. $C = -1$
- E. $C = 3$

188. After taking phenacetin a patient complained about sore throat and impossibility of deglutition. An otolaryngologist made a diagnosis of necrotic angina. In blood: Hb- 130 g/l, erythrocytes - $4,5 \cdot 10^{12}/l$, leukocytes - $3,0 \cdot 10^9/l$, among them lymphocytes - 75%, neutrophils - 10%, eosinophils - 5%, monocytes - 10%. What type of white blood cell disorder is it?

- A. Neutropenia
- B. Neutrophilia
- C. Monocytosis
- D. Eosinophilia
- E. Lymphopenia

189. 3 years ago a patient was diagnosed with chronic glomerulonephritis. The patient has got multiple edemata within the last 6 months. What is the cause of their development?

- A. Proteinuria
- B. Hyperaldosteronism
- C. Injection of non-steroidal anti-inflammatory preparations
- D. Glucocorticoid treatment
- E. Vasopressin hyperproduction

190. One of the herbarium specimens of medicinal plants relates to the *Asteraceae* family. This plant is:

- A. *Arctica lappa*
- B. *Atropa belladonna*
- C. *Cassia acutifolia*
- D. *Urtica dioica*
- E. *Rubus idaeus*

191. Examination of a medicinal herb revealed that its leaves were divided down to the base of the leaf blade with segments radiating from a common point in a fan manner. These leaves are:

- A. Palmatisected
- B. Pinnatisected
- C. Palmatipartite
- D. Pinnatipartite
- E. Palmatilobate

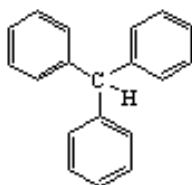
192. What is the primary standard for standardization of $Hg_2(NO_3)_2$ solution?

- A. Sodium chloride
- B. Sodium bromide
- C. Sodium sulphate
- D. Sodium hydroxide
- E. Sodium dichromate

193. After the diluted solution of hydrochloric acid had been added to the solution under examination, the white caseous precipitate settled down. This indicates presence of the following ions:

- A. Silver
- B. Ammonium
- C. Iron (II)
- D. Barium
- E. Iodine

194. Tritane relates to:



- A. Multinuclear arenes with isolated benzene cycles
- B. Multinuclear arenes with condensed benzene cycles
- C. Mononuclear arenes
- D. Alkanes
- E. Alkenes

195. Name the process characterized by a chemical interaction between an adsorbate and an adsorbent:

- A. Chemical adsorption
- B. Solvation
- C. Absorption
- D. Desorption
- E. Sedimentation

196. Optical isometry can be applied to the following compounds:

- A. Iodine fluorochloromethane ($CHIFCl$)
- B. Methane (CH_4)
- C. Chloroform ($CHCl_3$)
- D. Dichloromethane (CH_2Cl_2)
- E. Tetrachloromethane (CCl_4)

197. What analytical effect is observed when potassium cation is being determined by the sodium hexanitrocobaltate (III) solution?

- A. Yellow crystalline precipitate
- B. White crystalline precipitate
- C. Yellow colouring of the solution
- D. Black crystalline precipitate
- E. Red crystalline precipitate

198. Epidemic of influenza was announced in a town. Which drug can be recommended for the nonspecific prophylaxis of influenza?

- A. Leukocytic interferon
- B. Anti-influenza vaccine
- C. Antibiotics
- D. Anti-influenza immunoglobulin
- E. Anti-influenza serum

199. A drug solution under examination contains cations of magnesium (II) and aluminium (III). Which reagent can help to separate these cations during analysis of this drug?

- A. Alkali solution
- B. Solution of hydrogen peroxide in acidic medium
- C. Solution of silver nitrate
- D. Ammonia solution
- E. Solution of chloride acid

200. Quantitative determination of pharmaceutical substances can be carried out by method of alkalimetry using 0,1 M sodium hydroxide solution as a titrant. Precise concentration of sodium hydroxide can be determined according to:

- A. Oxalic acid
- B. Sodium tetraborate
- C. Potassium dichromate
- D. Sodium thiosulphate
- E. Ammonium hydroxide