

1. Generation of primary urine in kidneys is induced by filtration in renal corpuscles. What components of blood plasma are absent in the primary urine?

- A. Proteins
- B. Amino acids
- C. Glucose
- D. Urea
- E. Ions

2. 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

3. Morphological analysis of an inflorescence revealed that its flowers were attached to the same axis at different levels but due to different length of peduncle they grew in the same plane. Such inflorescence is called:

- A. *Corymb*
- B. *Anthodium*
- C. *Glomus*
- D. *Umbel*
- E. *Spike*

4. A patient has high concentration of chylomicrons in blood, especially after taking fatty food. He has also type I hyperlipoproteinemia that resulted from deficiency of the following enzyme:

- A. Lipoprotein lipase
- B. Adenylate cyclase
- C. Protein kinase
- D. Phospholipase C
- E. Prostaglandin synthetase

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 female patient suffers from chronic glomerulonephritis. Urine analysis revealed proteinuria, hematuria, leukocyturia. Proteinuria indicates di-

sturbance of the following process in kidneys:

- A. Glomerular filtration
- B. Tubular secretion
- C. Tubular reabsorption
- D. Tubular secretion and reabsorption
- E. Renal blood flow

7. What reagent should be chosen in order to detect presence of Ca^{2+} cation in a solution?

- A. $(NH_4)_2C_2O_4$
- B. HCl
- C. HNO_3
- D. KCl
- E. $NaBr$

8. 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

9. A patient has neurasthenic syndrome, diarrhea, dermatitis. This is associated with deficiency of the following vitamin:

- A. Nicotinic acid
- B. Vitamin K
- C. Vitamin D
- D. Folic acid
- E. Vitamin B_{12}

10. During microbiological inspection of crude drugs encapsulated bacteria were revealed. What method was applied for capsule detection?

- A. Burry-Gins
- B. Ziehl-Neelsen
- C. Neisser
- D. Gram
- E. Ozheshko

11. Pharmaceutical preparations of protein hydrolysate are applied for parenteral proteinic feeding. Hydrolysates are of full value if they contain essential amino acids. Which of the following amino acids relates to the essential ones:

- A. Methionine
- B. Cysteine
- C. Alanine
- D. Serine
- E. Glycine

12. An essential oil plant under examinati-

on has tetraquetrous stalk, flowers with bilabiate corolla, coenobium fruit. These characteristics are typical for the following family:

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

13. Name a complex compound that has antitumoral activity:

- A. $[Pt(NH_3)_2Cl_2]$
- B. $[Co(NH_3)_5NO_3]Cl_2$
- C. $Na_4[Sn(OH)_3Cl_3]$
- D. $[Cu(NH_3)_4(SCN)_2]$
- E. $K_2Na[Co(NO_2)_6]$

14. Solution applied as isotonic solution should have the following osmotic pressure:

- A. 700 - 800 kPa
- B. 200 - 300 kPa
- C. 300 - 400 kPa
- D. 500 - 600 kPa
- E. 900 - 1000 kPa

15. According to Schultze-Hardy rule coagulating action of coagulant ion is affected by:

- A. Ion charge
- B. Ion size
- C. Adsorbability
- D. Hydratability
- E. Polarizability

16. What reaction is applied for detection of Fe^{3+} cation?

- A. Complexing
- B. Precipitation
- C. Hydrolysis
- D. Neutralization
- E. Reduction

17. Dimethyl glyoxime entered into reaction with a solution that contained cations of the IV analytical group (acid-base classification). The deposition turned crimson. What cation caused this analytical effect?

- A. Nickel cation (II)
- B. Mercury cation (II)
- C. Copper cation (II)
- D. Cadmium cation (II)
- E. Cobalt cation (II)

18. Drugs in form of colloid-

disperse systems are widely applied in pharmaceutical practice. What method of sol production relates to physical condensation?

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

19. A child with evident hypotrophy got edemata on his lower extremities, ascites. What is the main mechanism of pathogenesis of cachectic edema?

- A. Drop of oncotic pressure of blood plasma
- B. Rise of hydrostatic blood pressure
- C. Rise of oncotic pressure of intercellular fluid
- D. Increased permeability of vascular wall
- E. Disturbance of lymph outflow

20. A patient has impaired mesopic vision, his photopic vision is normal. What is the probable cause of such vision anomaly?

- A. Vitamin A deficiency
- B. Hyperopia
- C. Cones disfunction
- D. Myopia
- E. Vitamin D deficiency

21. Thiocyanatometry is based upon using of secondary standard solution of potassium thiocyanate that should be standardized according to the following standard solution of:

- A. Silver nitrate
- B. Hydrochloric acid
- C. Sulfuric acid
- D. Iron (II) sulfate
- E. Copper (II) nitrate

22. Concentration of potassium dichromate in a solution was determined by means of iodometry. Name a titrant of iodometric method for determination of strong oxidizer:

- A. Sodium thiosulfate
- B. Sodium hydroxide
- C. Potassium iodide
- D. Potassium permanganate
- E. Potassium bromate

23. Solution of potassium chromate was added to a solution under examination. As a result of it some yellow deposition settled down. This deposition cannot be dissolved in acetic acid. This means that

the solution under examination contains cations of:

- A. Barium
- B. Calcium
- C. Sodium
- D. Cobalt
- E. Magnesium

24. Enzyme hyaluronidase breaks down hyaluronic acid thus increasing intercellular permeability. Which vitamin strengthens vascular walls and inhibits activity of hyaluronidase?

- A. P
- B. A
- C. B₁
- D. B₂
- E. D

25. A patient underwent an operation. After it he was prescribed glycosaminoglycan that has coagulating action. Specify this substance:

- A. Heparin
- B. Keratan sulfate
- C. Hyaluronic acid
- D. Chondroitin-6-sulfate
- E. Chondroitin-4-sulfate

26. Examination of an inflorescence of sweet flag *Acorus calamus* L. revealed that it was encircled with a covering leaf (spathe) and small sessile flowers grew compactly on the thickened pulpy axis. Such inflorescence is called:

- A. Ear
- B. Glomus
- C. Spike
- D. Umbel
- E. Corymb

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

- A. SO₂
- B. SO₃
- C. CO₂
- D. PbO₂
- E. CrO₃

28. 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 sulfate

29. For determination of nitrate ions diphenylamine was added to the solution under examination. The following changes were observed:

- A. Generation of blue solution
- B. Generation of yellow deposition
- C. Generation of blue deposition
- D. Generation of brown gas
- E. Emergence of a typical smell

30. A patient was prescribed a bile preparation for better digestion of fatty food. What components of this preparation cause fat emulsification?

- A. Bile acids
- B. Cholesterol and its ethers
- C. Diglycerides
- D. Bilirubin glucuronids
- E. Bile pigments

31. Antibiotics can be classified according to various principles. According to the action mechanism cephalosporins relate to the following group:

- A. Inhibitors of cell wall synthesis
- B. Inhibitors of protein synthesis
- C. Inhibitors of respiratory processes
- D. Inhibitors of oxidative phosphorylation
- E. Inhibitors of cytoplasmic membrane synthesis

32. 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

33. 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

34. Qualitative reaction for determination of $Cr(VI)$ compounds is origination of chromium oxide-diperoxide that stains ether layer with blue. What is formula of this chromium compound?

- A. CrO_5
- B. CrO_3
- C. Cr_2O_3
- D. CrO
- E. $NaCrO_2$

35. Concentrated nitric acid and crystalline lead dioxide were added to a solution under examination. The solution turned crimson. This analytical effect indicates presence of:

- A. Manganese (II)
- B. Bismuth (III)
- C. Iron (III)
- D. Chromium (III)
- E. Tantalum (II)

36. Determination of chlorides in potable water can be done by means of mercurymetry. The following solution is used as a titrant:

- A. $Hg(NO_3)_2$
- B. $Hg_2(NO_3)_2$
- C. $HgCl_2$
- D. $HgSO_4$
- E. Hg_2Cl_2

37. What reagent enables detection of phenolic hydroxyl?

- A. $FeCl_3$
- B. $Ag(NH_3)_2OH$
- C. $NaNO_2 (HCl)$
- D. $Cu(OH)_2$
- E. -

38. 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

39. 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

40. Under conditions of high exterior temperature and dry climate heat emission will become more intense by means of:

- A. Evaporation
- B. Radiation
- C. Convection
- D. Conduction
- E. -

41. During an exam a student got high arterial pressure and palpitation. What is the probable cause of this phenomenon?

- A. Increased tonus of sympathetic nervous system
- B. Low excitability threshold of α and β adrenoreceptors
- C. Increased volume of circulating blood
- D. Decreased tonus of parasympathetic nervous system
- E. Secretion of glucocorticoids

42. During preventive examination of a patient a doctor revealed considerable weakening of patellar-tendon reflex. What part of CNS might be affected?

- A. Spinal cord
- B. Metencephalon
- C. Mesencephalon
- D. Thalamencephalon
- E. Cerebellum

43. Gluconeogenesis plays an important part in maintaining normal glucose rate in blood during starvation. Name the main substrate of this process:

- A. Amino acids
- B. Cholesterol
- C. Nucleic acids
- D. Bile acids
- E. Acetone

44. A 40 year old woman has been suffering from profuse uterine bleedings for a long time. Blood count: Hb- 90 g/l, erythrocytes - $3,9 \cdot 10^{12}/l$, colour index - 0,6. What is the main cause of hypochromic anemia?

- A. Iron loss with blood
- B. Increased consumption of iron
- C. Nonassimilability of iron
- D. Deficiency of vitamin B_{12}
- E. Insufficient iron content in food ration

45. During sanitary and bacteriological examination of air in a drugstore it was revealed that the air had high concentration of sanitary meaningful microorganisms. What microorganisms are these?

- A. Staphylococcus aureus and hemolytic streptococcus
- B. Diphtheritic and tuberculous bacilli
- C. Colibacilli and blue pus bacilli
- D. Epidermal staphylococcus and Sarcina
- E. Enterococci and Citrobacter

46. Steroid hormones are synthesized out of a precursor that contains cyclopentanoperhydrophenanthrene. Name this precursor:

- A. Cholesterol
- B. Acetyl-CoA
- C. Malonyl-CoA
- D. Levulinic acid
- E. Tyrosine

47. 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

48. Pulp of a needle leaf consists of living tissue with inner ansiform protuberances of membrane and chloroplasts along them. What is type of this leaf's parenchyma?

- A. Plicate
- B. Spongioid
- C. Palisade
- D. Storage
- E. Aeriferous

49. A patient suffering from gastric ulcer for a long time has dramatic emaciation, skin pallor, appetite loss, aversion to meat products. Biopsy of mucous membrane of stomach revealed cellular atypia. What pathology are these symptoms typical for?

- A. Malignant tumour of stomach
- B. Benign tumour of stomach
- C. Polyposis
- D. Hypertrophic gastritis
- E. Helminthic invasion

50. A patient had cerebral haemorrhage that made impossible active motions of left arm and leg. Muscle tone of these

limbs is increased, their spinal reflexes are intensified, reflex zones are increased. What type of CNS disorder is it?

- A. Central paralysis
- B. Peripheral paralysis
- C. Spinal shock
- D. Atonic paralysis
- E. Reflex paralysis

51. Bacteriological control of unsterile drugs allows presence of small quantity of some microorganism groups. What group is meant?

- A. Sarcina
- B. Colon bacillus
- C. Bacillus pynocyanus
- D. Staphylococcus aureus
- E. Hemolytic streptococcus

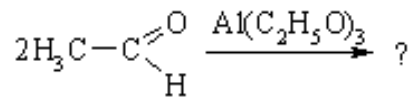
52. As a result of reduced water reabsorption in nephron tubules daily diuresis of a patient has increased up to 10 litres. This might be caused by reduced secretion of the following hormone:

- A. Vasopressin
- B. Aldosterone
- C. Parathormone
- D. Thyrocalcitonin
- E. Insulin

53. A product of complete acetylation of glycerine relates to the following class of organic compounds:

- A. Ester
- B. Ether
- C. Ketone
- D. Acetal
- E. Phenol

54. Name a product of ester condensation of acetaldehyde (Tishchenko reaction):



- A. Ethyl acetate
- B. Acetone
- C. Crotonic aldehyde
- D. Malonic acid
- E. Acetoacetic aldehyde

55. 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}

56. Excess of ammonia was added to a solution under examination. The solution turned bright blue. This indicates presence of the following ions:

- A. Copper
- B. Silver
- C. Lead
- D. Bismuth
- E. Mercury (II)

57. 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

58. Determination of sodium and potassium chlorides in pharmaceuticals can be done by means of:

- A. Argentometry, Mohr method
- B. Reduction-oxidation titration
- C. Alkalimetry
- D. Acidimetry
- E. Chelatometry

59. Diluted solution of hydrochloric acid was added to a solution under examination. This resulted in origin of white caseous deposition. This is the evidence of presence of following ions:

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

60. What reagent helps to distinguish glycerine from ethanol?

- A. $Cu(OH)_2$
- B. $SOCl_2$
- C. HNO_3 (concentrated), in presence of H_2SO_4 (concentrated)
- D. PCl_3
- E. PCl_5

61. 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

62. What disorders are possible as a result of thyroid insufficiency during infancy?

- A. Cretinism
- B. Nanism
- C. Gigantism
- D. Basedow's disease
- E. Itsenko-Cushing syndrome

63. A patient suffers from jaundice. Examination revealed that blood plasm had high concentration of indirect reacting (free) bilirubin, feces and urine had high concentration of stercobilin, concentration of direct reacting (conjugated) bilirubin was normal. What type of jaundice is it?

- A. Hemolytic
- B. Neonatal jaundice
- C. Parenchymatous
- D. Gilbert's disease
- E. Obstructive

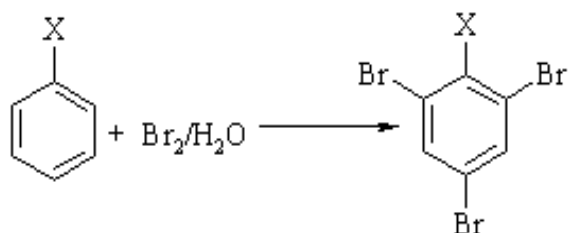
64. Which of the following cyclic compounds relates to the carbocyclic ones:

- A. Benzol
- B. Furan
- C. Tetrahydrofuran
- D. Pyridine
- E. Hexane

65. Ring-opening addition reactions are typical for the following cycloalkane:

- A. Cyclopropane
- B. Cyclohexane
- C. Cyclopentane
- D. Methylcyclopentane
- E. Cyclodecane

66. Bromination proceeds with generation of tribromoderivative in presence of the following substituent X:



- A. $X = OH$
- B. $X = COOH$
- C. $X = NO_2$
- D. $X = CHO$
- E. $X = SO_3H$

67. It is known that rhizome and roots of *Inula helenium* have cavities without distinct inner boundaries filled with essential oils. They are called:

- A. Lysigenous receptacles
- B. Schizogenous receptacles
- C. Resin ducts
- D. Segmented laticifers
- E. Nonsegmented laticifers

68. Gastric juice of a patient has decreased concentration of enzymes. What secretory cells of stomach display dysfunction?

- A. Chief cells of glands
- B. Parietal cells of glands
- C. Gland mucocytes
- D. Cells of tegumental epithelium
- E. G-cells

69. On the root section of *Helianthus annuus* a secondary fascicular structure was found. This means that the section was made in the zone of:

- A. Fixation and conduction
- B. Growth and distension
- C. Absorption
- D. Dividing cells
- E. Root cap (pileorhiza)

70. Fatty food is digested by means of several digestive juices. Which of them enables fat emulsification?

- A. Bile
- B. Saliva
- C. Intestinal juice
- D. Gastric juice
- E. Pancreatic juice

71. Pharmacological effect of enterogel (hydrogel of methylsilicic acid) is based upon the following phenomenon that is typical for disperse systems:

- A. Adsorption
- B. Adhesion
- C. Cohesion
- D. Moistening
- E. Desorption

72. Yield of medical products can be enhanced by proper choice of temperature conditions during their

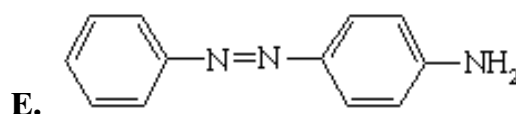
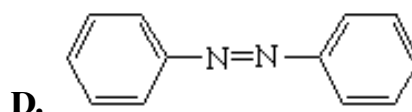
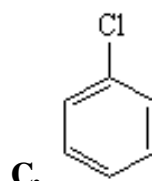
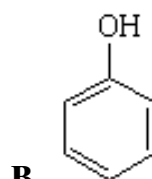
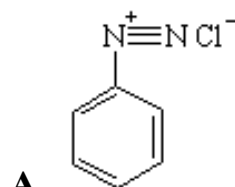
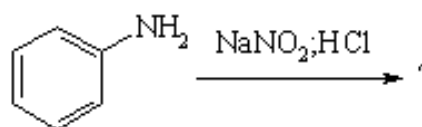
production. What equation determines dependence of equilibrium constant from the temperature under constant pressure?

- A. Isobaric lines of chemical reaction
- B. Isotherms of chemical reaction
- C. Kirchhoff equation
- D. Isochores of chemical reaction
- E. Gibbs-Helmholtz equation

73. A herbaceous plant under examination has segmented laticifers with anastomoses filled with white latex. This is typical for:

- A. *Taraxacum officinale*
- B. *Urtica dioica*
- C. *Chelidonium majus*
- D. *Anethum graveolens*
- E. *Thymus vulgaris*

74. What compound will be produced as a result of interaction of aniline with nitrite acid?



75. A few minutes after repeated introduction of penicillin a patient got dyspnea, tongue numbness, hyperemia and then skin pallor. The patient also lost consciousness. What is the cause of such a grave condition?

- A.** Anaphylactic shock
- B.** Serum sickness
- C.** Hemolytic anemia
- D.** Acute glomerulonephritis
- E.** Bronchial asthma

76. Cations of the third analytical group (acid-base classification) can be isolated in course of systematic analysis by means of the following group reagent:

- A.** 1 M solution of sulfate acid in presence of ethanol
- B.** 1 M solution of potassium chromate
- C.** 0,1 M solution of sodium carbonate
- D.** 0,1 M solution of ammonium oxalate
- E.** 1 M solution of ammonium carbonate

77. Solution of potassium iodide was added to the solution acidated with sulfate acid that contained anions of the third analytical group. Release of free iodine is observed. What anion are present in the solution?

- A.** Nitrite ion
- B.** Carbonate ion
- C.** Sulfate ion
- D.** Bromide ions
- E.** Acetate ions

78. During gravimetric determination of mass fraction of sulfate ions in the magnesium sulfate preparation precipitation is performed by means of barium chloride solution. Precipitated barium sulfate should be rinsed with:

- A.** Diluted solution of sulfate acid
- B.** Distilled water
- C.** Solution of barium chloride
- D.** Solution of sodium sulfate
- E.** Solution of hydrochloride acid

79. 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

80. A patient suffering from chronic

cardiac insufficiency has got soft tissue edemata on his shins. What is the leading pathogenetic factor of edema development?

- A.** Rise of hydrostatic pressure in capillaries
- B.** Drop of osmotic pressure in blood plasma
- C.** Rise of oncotic pressure in tissues
- D.** Drop of hydrostatic pressure in capillaries
- E.** Rise of osmotic pressure in tissues

81. It is known that depending on *pH* of cellular fluid petal coloration can vary from blue-and-violet to pink and light pink. This is caused by presence of:

- A.** Anthocyanins
- B.** Carotins
- C.** Xanthophylls
- D.** Phycobilins
- E.** Chlorophylls

82. Which of the following plants has pome fruit?

- A.** *Sorbus aucuparia*
- B.** *Prunus domestica* L.
- C.** *Amygdalus communis*
- D.** *Rosa majalis*
- E.** *Prunus padus*

83. Bacteriological examination for bacteria carrying of drugstore workers revealed that one of the pharmacists had bacteria of genus *Staphylococcus*. What morphological peculiarities of microbial cell arrangement are typical for this genus?

- A.** They are arranged in form of bunch of grapes
- B.** They are arranged in form of a chain
- C.** They are arranged isolatedly
- D.** They are arranged in pairs
- E.** They are arranged in tetrads

84. Crude herbal drugs must be examined for yeastlike fungi. What agar can ensure development of these microorganisms so that associating microflora will grow very slowly or won't grow at all?

- A.** Sabouraud's peptone agar
- B.** Endo agar
- C.** Meat infusion agar
- D.** Milk-salt agar
- E.** Blood agar

85. A patient took maximally deep breath. Air volume being in lungs under these

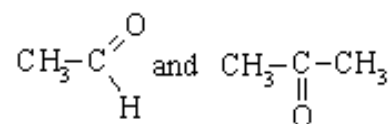
conditions is called:

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

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

- A. H_2
- B. CH_3OH
- C. CH_3I
- D. HCN
- E. $HCOH$

87. What reagent enables differentiation of the following pair of compounds?

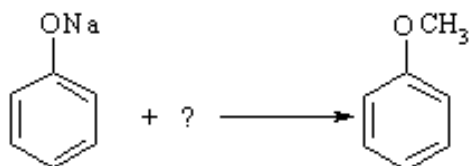


- A. Foelling's reagent
- B. $NaHSO_3$
- C. $NH_2 - NHC_6H_5$
- D. HCN
- E. $H_2N - OH$

88. Stable contraction of myofibrilla of muscle fibers takes place due to accumulation of the following ions in the cytoplasm:

- A. Calcium
- B. Potassium
- C. Sodium
- D. Magnesium
- E. Hydrogen

89. 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. $CH_3C \equiv N$

90. Examination of air state in drugstore premises for preparation of injection drugs was done by method of sedimentati-

on. 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

91. Which of the following solutions of the same molality has the highest boiling temperature?

- A. $Al_2(SO_4)_3$ solution
- B. $K_3[Fe(CN)_6]$ solution
- C. Saccharose solution
- D. $CaCl_2$ solution
- E. $NaCl$ solution

92. During bacteriological analysis of solutions prepared in a pharmacy some red colonies with metallic glitter have grown on Endo agar. What microbes were revealed?

- A. Escherichia
- B. Shigella
- C. Staphylococci
- D. Streptococci
- E. Salmonella

93. Most technological processed in pharmaceuticals run in heterogenous 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

94. 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. $C_{10}H_{21}SO_3Na$

95. Pharmaceutical preparation collargol is a colloid silver solution containing a high-molecular compound. What is the function of this compound?

- A. It enhances aggregative stability
- B. It induces coagulation
- C. It facilitates sedimentation
- D. It reduces aggregative stability
- E. It increases dispersion degree

96. Which of the following reactions is addition reaction?

- A.
$$\text{CH}_3\text{-CH}=\text{CH}_2 \xrightarrow{\text{Br}_2} \text{CH}_3\text{-}\underset{\text{Br}}{\text{CH}}\text{-}\underset{\text{Br}}{\text{CH}_2}$$
- B.
$$\text{CH}_3\text{-CH}=\text{CH}_2 \xrightarrow{\text{Cl}_2, t} \text{ClCH}_2\text{-CH}=\text{CH}_2 + \text{HCl}$$
- C.
$$\text{CH}_3\text{-CH}=\text{CH}_2 \xrightarrow[\text{KMnO}_4]{[\text{O}]} \text{CH}_3\text{-}\underset{\text{OH}}{\text{CH}}\text{-}\underset{\text{OH}}{\text{CH}_2}$$
- D.
$$n\text{CH}_3\text{-CH}=\text{CH}_2 \xrightarrow{t} \left[\underset{\text{CH}_3}{\text{CH}}\text{-CH}_2 \right]_n$$
- E.
$$\text{Zn} + \text{CH}_3\text{COOH} \xrightarrow{\quad} \text{CH}_3\text{-}\overset{\text{O}}{\parallel}{\text{C}}\text{-H} + \text{H-}\overset{\text{O}}{\parallel}{\text{C}}\text{-H}$$

97. Choose the most stable complex ion on the ground of values of instability constants:

- A. $[\text{Fe}(\text{CN})_6]^{3-}$ $K_{\text{H}} = 1 \cdot 10^{-31}$
- B. $[\text{Ag}(\text{CN})_2]^-$ $K_{\text{H}} = 1 \cdot 10^{-21}$
- C. $[\text{Ag}(\text{NH}_3)_2]^+$ $K_{\text{H}} = 5,89 \cdot 10^{-8}$
- D. $[\text{Ni}(\text{CN})_4]^{2-}$ $K_{\text{H}} = 1 \cdot 10^{-22}$
- E. $[\text{Co}(\text{NH}_3)_6]^{2+}$ $K_{\text{H}} = 4,07 \cdot 10^{-5}$

98. Change of acid-base properties in the compounds $\text{MnO} \rightarrow \text{MnO}_2 \rightarrow \text{Mn}_2\text{O}_7$ answers to the following regularity:

- A. Acidic properties become stronger
- B. Basic properties become stronger
- C. Acid-base properties stay unchanged
- D. Acidic properties diminish
- E. -

99. A 38 year old patient had hepatitis but didn't give up alcohol. There appeared symptoms of hepatocirrhosis along with ascites and edemata of his lower limbs. What changes in blood are main factor of

edemata development?

- A. Hypoalbuminemia
- B. Hypoglobulinemia
- C. Hypocholesterolemia
- D. Hypokalemia
- E. Hypoglycemia

100. Apical bud of a sprout stops its development early and growth is realized due to two lateral buds placed opposite one another under the apex. Such ramification is called:

- A. Pseudodichotomic
- B. Equidichotomic
- C. Monopodial
- D. Nonequidichotomic
- E. Bush

101. Choose a diazonium salt among the given compounds:

- A.
- B.
- C.
- D.
- E.

102. Introduction of glucocorticoids induces strengthening of glucose concentration in blood. Which of the following processes will be activated in liver?

- A. Gluconeogenesis
- B. Glycogenolysis
- C. Oxidation of fatty acids
- D. Ketogenesis
- E. Glycolysis

103. An electrode composed by scheme $Au^{3+} | Au$ relates to the following type:

- A. I type electrodes
- B. II type electrodes
- C. III type electrodes
- D. Oxidation-reduction electrodes
- E. Ion-selective electrodes

104. You need to prepare ammoniac buffer solution. For this purpose you should add the following solution to the water solution of ammonia:

- A. Solution of ammonium chloride
- B. Solution of chloride acid
- C. Solution of sulfate acid
- D. Solution of potassium chloride
- E. Solution of sodium sulfate

105. Alkadiene is a name for aliphatic carbohydrates with double bonds. Choose a general formula for homologous series of alkadienes:

- A. C_nH_{2n-2}
- B. C_nH_{2n+2}
- C. C_nH_{2n}
- D. C_nH_{2n+1}
- E. C_nH_{2n-1}

106. Urea is a derivative of carbonic acid. Choose a denomination of urea:

- A. Diamide of carbonic acid
- B. Monoamide of carbonic acid
- C. Ethylic ether of carbamic acid
- D. Diethylic ether of carbonic acid
- E. Dimethylic ether of carbonic acid

107. Choose a pair of substances that can be used for standardization of 0,1 M solution of $KMnO_4$:

- A. $Na_2C_2O_4, H_2C_2O_4$
- B. K_2CO_3, CH_3COOH
- C. $CH_3COOK, H_2C_2O_4$
- D. $KHC_2O_4, HCOOH$
- E. $Na_2C_2O_4, CH_3COOH$

108. A patient complains about gingival haemorrhage, petechial haemorrhages. What vitamin preparation should be recommended?

- A. Ascorutinum
- B. Thiamine hydrochloride
- C. Cyanocobalamin
- D. Nicotinic acid
- E. Pyridoxine hydrochloride

109. What form of hypoxia develops during shock and collapse?

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

110. Employees of a physicochemical laboratory prepared water solutions of urea, glucose, sodium sulfate, aluminium sulfate and sodium benzoate all of which had the same molar concentration. What solution has the highest osmotic pressure under $298^\circ K$?

- A. Aluminium sulfate
- B. Urea
- C. Glucose
- D. Sodium benzoate
- E. Sodium sulfate

111. 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

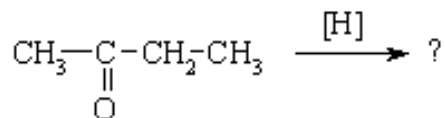
112. Blood analysis revealed rise of activity of LDH_1, LDH_2 , aspartate aminotransferase, kreatine phosphokinase- MB . Biochemical disorder is observed in the following organ:

- A. Heart
- B. Skeletal muscles
- C. Kidneys
- D. Liver
- E. Pancreas

113. Limited swelling of gelatine comes to unlimited one (solution formation) under the following conditions:

- A. Heating
- B. Cooling
- C. In presence of SO_4^{2-} ions
- D. In presence of Cl^- ions
- E. If pH medium matches with isoelectric point

114. What compound will be produced during reduction of methyl ethyl ketone?



- A. *secondary*-butyl alcohol
- B. Butanol-1
- C. Isobutyl alcohol
- D. *tertiary*-butyl alcohol
- E. Propanol-2

115. A female patient has been treated with antibiotics for a long time. Thereafter examination of smears from vaginal secretion revealed oval cells with well-defined nucleus, some cells gemmate. What preparations can help to confirm the diagnosis "candidosis"?

- A. Antifungal
- B. Antibacterial
- C. Antichlamydia
- D. Antiviral
- E. Antiprotozoal

116. One of mass production drugs is produced by inactivation of bacterial exotoxin by formalin. What is this drug for?

- A. For active immunization
- B. For serodiagnostic assay
- C. For passive immunization
- D. For toxinemia treatment
- E. For immunocorrection

117. Digestion of proteins in the digestive tract is a complex process of their hydrolysis till peptides and free amino acids. What enzymes decompose proteins in the duodenum?

- A. Trypsin, chemotrypsin
- B. Enterokinase, lipase
- C. Amylase, maltase
- D. Pepsin, gastrin
- E. Lipase, phospholipase

118. Permanganatometry enables determination of H_2O_2 in high-acidity medium. What acid can be used for production of such medium?

- A. H_2SO_4
- B. HCl
- C. HNO_3
- D. CH_3COOH
- E. H_3PO_4

119. You are given 0,05 M solution of versene. What is standard substance for standardization of this solution?

- A. Metallic zinc
- B. Sodium tetraborate
- C. Sodium hydroxide
- D. Oxalic acid
- E. Potassium dichromate

120. A 56 year old patient complains about limitation of movements and pain in hand joints, mainly at night. Objectively: there is a disfiguring painful swelling of affected joints. Blood and urine have high concentration of uric acid. What disease has developed?

- A. Gout
- B. Pellagra
- C. Phenylketonuria
- D. Alkaptonuria
- E. Tyrosinosis

121. Electronic microscopy of a cell revealed mitochondrial destruction. What processes are disturbed?

- A. ATP synthesis
- B. Protein biosynthesis
- C. Glycolysis
- D. Synthesis of nucleic acids
- E. Fat synthesis

122. What changes will be observed in the isolated heart after introduction of adrenaline into perfusion solution?

- A. Heart rate rise
- B. Heart rate fall
- C. Heart force fall
- D. Conduction reduction
- E. Excitability reduction

123. Analytical indication of effect of potassium iodide solution upon unstained oxidizing anions in presence of chloroform is:

- A. Brown stain of free iodine
- B. Settling down of white deposition
- C. Change of aggregate state
- D. Emission of gas bubbles
- E. Origination of deposition and its solution in reagent excess

124. Benzoic acid enters into benzene ring reaction with the following reagent:

- A. $HNO_3 (k) + H_2SO_4 (k)$
 B. $NaOH$
 C. PCl_3
 D. $NH_3 : t$
 E. P_2O_5

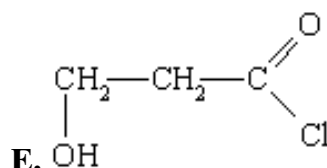
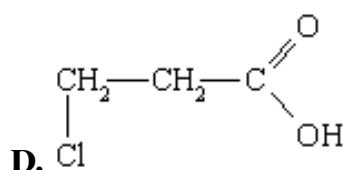
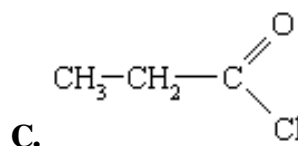
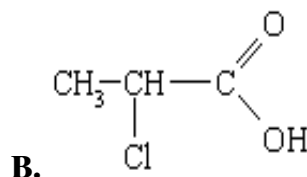
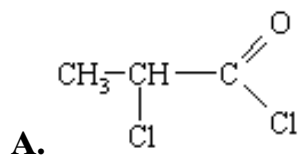
125. A patient diagnosed with botulism was admitted to the infectious disease hospital. What medication should be applied in the first place?

- A. Antitoxic serum
 B. Anatoxin
 C. Antibiotics
 D. Sulfanilamides
 E. Nitrofurans

126. 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

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



128. 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

129. Positive sol of iron hydroxide was generated by method of hydrolysis. What coagulating ion will have the lowest coagulation threshold?

- A. Phosphate
 B. Sulfate
 C. Chloride
 D. Nitrate
 E. Bromide

130. In pharmaceutical synthesis both simple and complex reactions are applied. Specify the order of the simple reaction of type $2A + B = 3D$:

- A. 3
- B. 2
- C. 1
- D. 0
- E. 0,5

131. In order to determine CO_2 in air the following substance can be applied:

- A. Water solution $Ca(OH)_2$
- B. Water solution $NaOH$
- C. CaO
- D. $Fe(OH)_2$
- E. Crystalline $NaOH$

132. Anatomico-histochemical analysis of a petiole revealed living parenchyma cells with cellulose, angular thickened membranes under the epiderm and above the fascicle. This is typical for:

- A. Angular collenchyma
- B. Spongy perenchyma
- C. Lamellar collenchyme
- D. Lacunar collenchyme
- E. Bast fibers

133. A compound under examination contains cations of iron (III) and copper (II). What group reagent can separate these cations?

- A. Concentrated ammonia solution
- B. Solution of sodium hydroxide and hydrogen peroxide
- C. Concentrated solution of hydrochloric acid
- D. Solution of sodium hydroxide
- E. Concentrated solution of sulfuric acid

134. Heme (a constituent part of hemoglobin) is a complex iron compound. It relates to the following type of complex compounds:

- A. Chelate complex
- B. Acidocomplex
- C. Aquacomplex
- D. Cationic complex
- E. Hydroxocomplex

135. Which compound was generated due to nonpolar covalent type of chemical bond?

- A. H_2
- B. KCl
- C. NH_4Cl
- D. KI
- E. H_2S

136. Patient's joints are enlarged, look like thickened disfigured knots. Blood

analysis revealed high concentration of uric acid and its salts. This state is caused by metabolic disorder of the following substances:

- A. Purines
- B. Pyrimidines
- C. Porphyrines
- D. Cholesterol
- E. Phospholipids

137. Albinism is characterized by lacking formation of melanin in an organism. This disease is caused by metabolic disorder of the following amino acid:

- A. Phenylalanine
- B. Methionine
- C. Alanine
- D. Glutargine
- E. Asparagine

138. A boy is 4 year old. Glucose concentration in blood plasma is 12 millimole/l. This might be caused by deficiency of the following hormone:

- A. Insulin
- B. Glucagon
- C. Cortisol
- D. Somatotropin
- E. Adrenocorticotropin

139. You have to carry out a qualitative analysis. What substance will originate from chromium ions under the influence of group reagent excess (solution of sodium hydroxide) upon cations of the IV analytical group?

- A. Sodium hexahydroxochromate (III)
- B. Chromium (III) hydroxide
- C. Chromium (III) oxide
- D. Chromium (II) hydroxide
- E. Chromium (II) oxide

140. Which of the given bases is a weak electrolyte?

- A. $Mg(OH)_2$
- B. $Ca(OH)_2$
- C. $Ba(OH)_2$
- D. $NaOH$
- E. KOH

141. During study of pharmaceutical substances pH rate can be determined by method of potentiometry. What electrode can be used as an indicator during measuring of pH solution?

- A. Glass
- B. Copper
- C. Silver-chloride
- D. Calomel
- E. Zinc

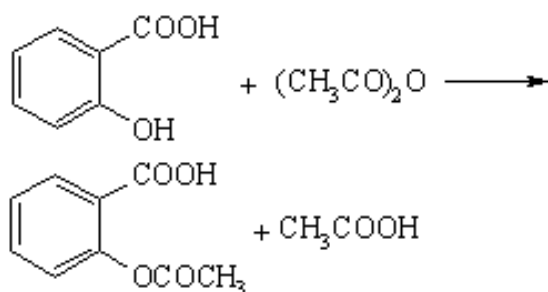
142. A 40 year old patient complains about general weakness, headache, body temperature rise, cough with sputum, dyspnea. After examination his illness was diagnosed as focal pneumonia. What type of hypoxia is observed?

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

143. If concentrated HNO_3 interreacts with copper, it can be reduced to the following compound:

- A. NO_2
- B. NO
- C. N_2O
- D. N_2
- E. NH_4NO_3

144. The given reaction is called:



- A. Acylation
- B. Esterification
- C. Addition
- D. Removal
- E. Regrouping

145. A 58 year old patient complained about persistent rise of arterial pressure. Clinical examination revealed chronic renal disease accompanied by disturbance of renal blood flow. Rise of arterial pressure was induced by activation of the following regulatory system:

- A. Renin-angiotensin
- B. Parasympathetic nervous
- C. Sympathetic nervous
- D. Sympathoadrenal
- E. Hypothalamo-pituitary-adrenal

146. All the undermentioned water soluti-

ons of pharmaceutical substances have molal concentration of 0,1 mole/kg. Which solution has the maximal boiling-point elevation?

- A. Sodium acetate
- B. Glucose
- C. Nicotinic acid
- D. Ethanol
- E. Ascorbic acid

147. Thyroid hormones are derivatives of amino acids. What amino acid underlies the structure of these hormones?

- A. Tyrosine
- B. Proline
- C. Tryptophan
- D. Serine
- E. Glutamine

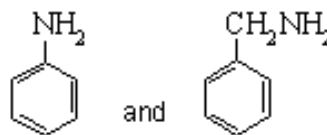
148. Which of the following sterilization methods ensures total death of microorganisms and their spores during one-time thermal processing of an object?

- A. Autoclaving
- B. Boiling
- C. Tyndallization
- D. Pasteurization
- E. -

149. Manganese and chlorine demonstrate the most similar properties when they have the following oxidation number:

- A. +7
- B. +3
- C. 0
- D. +4
- E. +2

150. Choose a generalized reaction that will help to reveal an amino group in the following compounds:

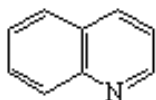


- A. Isonitrile assay
- B. Diazotization
- C. Azo dye generation
- D. Alkylation
- E. Acylation

151. 150 ml of meat broth was introduced into the gastric cavity of an experimental dog through the feeding tube. This will result in rapid rise of concentration of the following hormone in the animal's blood:

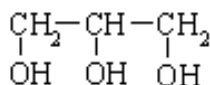
- A. Gastrin
- B. Vasointestinal polypeptide
- C. Neurotensin
- D. Somatostatin
- E. Insulin

152. What denomination corresponds with the given formula?



- A. Benzo [b] pyridine
- B. Benzo [b] pyrone-4
- C. Imidoazopyrimidine
- D. Pyrazinopyrimidine
- E. Benzothiazole

153. According to the IUPAC nomenclature the given compound has the following denomination:



- A. 1, 2, 3 – *propanetriol*
- B. 1 – *propanol*
- C. 2 – *propanol*
- D. 1 – *propanethiol*
- E. 1, 2 – *propanediol*

154. A 13 year old child complains about poor appetite, pain in the right subcostal area. Microscopical examination of duodenal contents revealed big pyriform cells with two nuclei. What microorganism was revealed?

- A. *Lambli*a
- B. *Trichomonad*
- C. *Amoeba*
- D. *Trypanosoma*
- E. *Toxoplasma*

155. Systems relate to colloid-disperse ones if size of their particles is within the following range:

- A. $10^{-9} - 10^{-7}$ m
- B. $10^{-7} - 10^{-4}$ m
- C. $> 10^{-4}$ m
- D. $\leq 10^{-9}$ m
- E. $10^{-9} - 10^{-4}$ m

156. 0,1 M solution of the following acid has the highest concentration of hydrogen ions:

- A. *HCl*
- B. *HCN*
- C. *H₂CO₃*
- D. *CH₃COOH*
- E. *H₂SO₃*

157. What is oxidation number of the central atom in the compound $H[AuCl_4]$?

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

158. A child got burn on his hand caused by hot water. Burn skin is bright red. What disturbance of local blood circulation is it?

- A. Arterial hyperemia
- B. Venous hyperemia
- C. Stasis
- D. Thrombosis
- E. Embolism

159. A plantation of medicinal plants was affected by a disease that caused yellow spots and necrotic areas on leaves. Juice of affected plants remains infectious even after bacterial filtration but after its inoculation on cultural medium growth of causative agent wasn't observed. Causative agent of this disease relates most probably to the following group of plant pathogenic microorganisms:

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

160. It is known that a peroral drug contains over 1 billion of living microbial cells per 1 millilitre. Nonetheless the drug was accepted as applicable. What drug group does it relate to?

- A. Eubiotics
- B. Antibiotics
- C. Vitamins
- D. Sulfanilamides
- E. Immunostimulants

161. Microscopical examination of a leaf revealed water stomata on its serration. These stomata are for exudation of liquid-drop moisture. This process is called:

- A. Guttation
- B. Gas exchange
- C. Internal secretion
- D. Transpiration
- E. Photosynthesis

162. A man has symptoms of cardiovascular atherosclerosis. The most probable characteristic of this state will be growth of the following biochemical value:

- A. Concentration of low-density lipoproteins
- B. Concentration of high-density lipoproteins
- C. Concentration of chylomicrons
- D. LDH_5 activity
- E. Activity of pancreatic lipase

163. Presence of the following ion of *d*-elements in solutions can be exploited by means of $K_4[Fe(CN)_6]$:

- A. Fe^{3+}
- B. Zn^{2+}
- C. Cr^{3+}
- D. Ni^{2+}
- E. Cu^{2+}

164. Sol is one of drug forms. What happens if sols are fused with oppositely charged granules?

- A. Mutual coagulation
- B. Thixotropy
- C. Sedimentation
- D. Contraction
- E. Lyophilization

165. A patient has obstructive respiratory failure. Name a disease that is usually accompanied by such type of respiratory failure:

- A. Bronchial asthma
- B. Pneumonia
- C. Exudative pleuritis
- D. Pneumoconiosis
- E. Pneumothorax

166. A patient is 54 year old. After intense emotional stress he felt strong pain behind his breastbone irradiating to his left arm and left part of his neck. He felt also death anxiety and broke into a cold sweat. Nitroglycerine relieved pain. Name a disturbance of local blood circulation in heart that has developed in this case:

- A. Ischemia
- B. Thrombosis
- C. Embolism
- D. Arterial hyperemia
- E. Venous hyperemia

167. Choose an appropriate indicator for fixation of titration end point in method of bromatometry:

- A. Methyl red
- B. Phenolphthalein
- C. Starch
- D. Methyl blue
- E. Tropeolin 00

168. Decarboxylation of 5-hydroxytryptophane gives origin to a certain biogenic amine with vasoconstrictive action. What biogenic amine is it?

- A. Serotonin
- B. Histamine
- C. Gamma-aminobutyric acid
- D. Putrescine
- E. Cadaverine

169. An annual plant of the *Asteraceae* family has tripartite leaves, apical anthodia with tubular flowers, flat achenocarps that are tenent due to 2-3 bristly serratures. This plant is:

- A. *Bidens tripartita*
- B. *Chamomilia recutita*
- C. *Centaurea cyanus*
- D. *Echinacea purpurea*
- E. *Artemisia vulgaris*

170. Crop production includes cultivation of medicinal essential oil plants that don't grow in Ukraine wildely, namely *Mentha piperita*, *Ortosiphon stamineus*, and also:

- A. *Salvia officinalis*
- B. *Origanum vulgare*
- C. *Leonurus cardiaca*
- D. *Thymus serpyllum*
- E. *Leonurus quinquelobatus*

171. A patient was admitted to the infectious department of a hospital. His provisional diagnosis was "acute gastroenteritis". Inoculation of feces on bismuth-sulfite agar induced growth of black colonies with metallic glitter. What microorganisms should you think of?

- A. *Salmonellae*
- B. *Escherichia*
- C. *Shigella*
- D. *Yersinia*
- E. *Brucella*

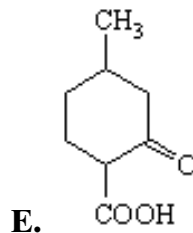
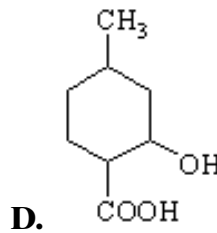
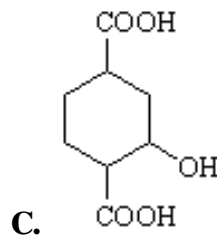
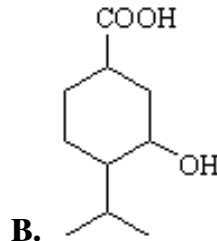
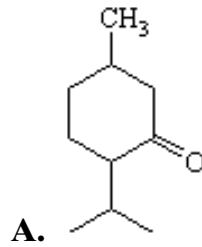
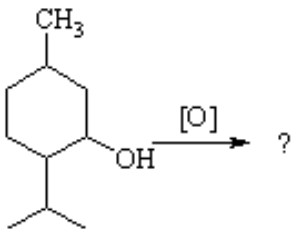
172. Potassium permanganate $KMnO_4$ is used in medicine as a bactericidal drug. What chemical properties of $KMnO_4$ determine its bactericidal action?

- A. Oxidative
- B. Acidic
- C. Basic
- D. Reducing
- E. Heat-activated dissociability

173. Sodium hydrogen arsenate $Na_2HAsO_4 \cdot 7H_2O$ is applied in medicine as general health-improving and tonic drug. What type of salts does it relate to?

- A. Acid salts
- B. Neutral salts
- C. Basic salts
- D. Double salts
- E. Mixed salts

174. Oxidation of menthol by potassium dichromate in sulfuric acid (chrome mixture) results in production of:



175. Isoelectric point of protein equals 8,3. Electrophoretic mobility of protein macromolecule will be equal zero if pH value is:

- A. 8,3
- B. 7,0
- C. 11,5
- D. 2,3
- E. 4,7

176. A male patient who suffers from chronic intestinal obstruction has intensified putrefaction of proteins in the colon. What toxic substance originates from tryptophane in this case?

- A. Indole
- B. Bilirubin
- C. Lactate
- D. Kreatine
- E. Glucose

177. A patient takes blocker of muscarinic cholinoreceptors of parasympathetic nerve organ synapses. What changes of heart activity will be observed?

- A. Heart rate rise
- B. Heart rate and heart force fall
- C. Heart rate fall
- D. Heart force fall
- E. Prolongation of atrioventricular delay

178. 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

179. 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

180. 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*

181. A male patient has pain in the right subcostal area, acholic feces. Decolouration of feces is caused by deficiency of:

- A. Stercobilin
- B. Hemoglobin
- C. Bilirubin
- D. Bile acids
- E. Skatole

182. 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. Tryptophane hydroxylase
- E. Glutaminase

183. Low rate of vitamin B₆ 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. Phosphorilation
- D. Methylation
- E. Hydrolysis

184. During blowing up a balloon a boy took maximally deep and prolonged inspirations and expirations. Thereafter he felt slight dizziness. What is the probable cause of this phenomenon?

- A. Drop of pCO_2 in blood
- B. Rise of pCO_2 in blood
- C. Bronchi constriction
- D. Arterial pressure rise
- E. Drop of pO_2 in blood

185. A child has got a burn. Burnt skin is hyperemic, there are small vesicles full of transparent fluid. What type of fluid is it?

- A. Serous exudate
- B. Hemorrhagic exudate
- C. Purulent exudate
- D. Transsudate
- E. Putrid exudate

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

- A. NO
- B. NH₃
- C. N₂
- D. N₂O
- E. -

187. A biological system (living organism) exchanges material and energy with the environment. What system does it relate to?

- A. Open, heterogenous
- B. Isolated, heterogenous
- C. Closed, homogenous
- D. Closed, heterogenous
- E. Open, homogenous

188. A patient has been suffering from diabetes mellitus for 10 years. He was deli-

vered 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

189. 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

190. What cations added to the solution of potassium iodide form orange-red deposition that is soluble in reagent excess and builds up a colourless solution?

- A. Mercury (II)
- B. Mercury (I)
- C. Bismuth
- D. Antimony (V)
- E. Lead

191. Microscopical examination of transverse section of a root revealed investing tissue consisting of thin-walled, closely joining cells with root fibrilla. This tissue is called:

- A. Epiblem
- B. Root cap (pileorhiza)
- C. Periderm
- D. Endoderm
- E. Epiderm

192. Monopodial inflorescences of plantain (spike) and maize (ear) have one trait in common: their flowers are placed on the well-developed principal axis. This is typical for the following inflorescences:

- A. Simple botrioid
- B. Complex botrioid
- C. Cymose
- D. Aggregate
- E. Thyrsoid

193. A leaf has glumaceous ochrea. It clasps bottom of internode and is a modified stipule. This is diagnostic sign of

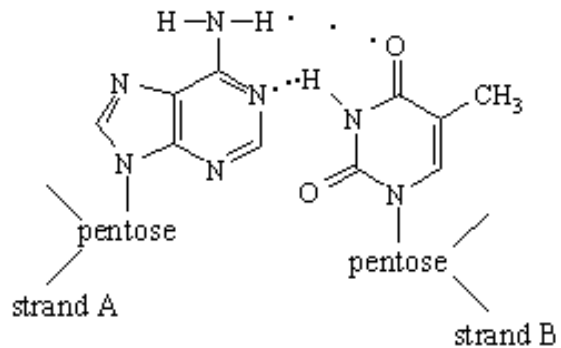
the following family:

- A. *Polygonaceae*
- B. *Gramineae*
- C. *Rosaceae*
- D. *Legumes*
- E. *Solanaceae*

194. A bacterial cell obtains nutrients by different ways. One of them is the facilitated diffusion that is realized by special membrane carrier proteins. What are these proteins called?

- A. Permeases
- B. Lyases
- C. Oxidoreductases
- D. Isomerizing enzymes
- E. Ligases

195. Name type of bond between complementary bases:



- A. Hydrogen bond
- B. Covalent π -bond
- C. Ionic bond
- D. Covalent σ -bond
- E. Semipolar bond

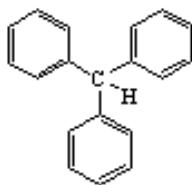
196. You need to specify a monocarpous one-seeded fruit with hard scleroid endocarp and soft mesocarp. This fruit is:

- A. *Monodrupe*
- B. *Legume*
- C. *Silique*
- D. *Capsule*
- E. *Bacca*

197. 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*

198. Tritane relates to:



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

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. What method ensures reliable sterilization of biological fluids (sera, solutions, enzymes, vitamins etc.) that can't stand high temperatures?

- A.** Tyndallization
- B.** Dry-heat sterilization
- C.** Flowing steam
- D.** Moist steam under pressure
- E.** Flaming