

1. Steric factor is used for accurate calculation of the velocity constant based on the activation energy. This factor takes the following into account:

- A. Mutual orientation of the reacting molecules
- B. Chemical properties of the interacting compounds
- C. Concentration of the reacting substances
- D. Temperature of the reaction mixture
- E. Molecular structure of the interacting compounds

2. Microscopy of a specimen prepared from the patient's enlarged inguinal node and stained according to the Loeffler technique has detected chaotically arranged ovoid bacteria. The poles of the bacteria were stained more intensively. Such features are characteristic of the following microorganism:

- A. *Y. pestis*
- B. *N. gonorrhoeae*
- C. *T. pallidum*
- D. *L. interrogans*
- E. *M. tuberculosis*

3. To obtain bacterial exotoxins, microorganisms are cultivated in a liquid nutrient medium, into which the toxins are being released. What method allows clearing the medium of microorganisms and obtaining pure exotoxins?

- A. Filtration through bacterial filters
- B. Boiling
- C. Autoclaving
- D. Ultraviolet irradiation
- E. Application of disinfectants (Chloramine)

4. What method of analysis can an analytical chemist use to determine the aluminum content in "Alumag" ("Maalox") medicine by means of indirect titration?

- A. Complexometry
- B. Dichromatometry
- C. Argentometry
- D. Mercurimetry
- E. Iodometry

5. For tetanus prevention a certain toxin is used. For 4 weeks this toxin is being neutralized with formaldehyde (0.4%) under the temperature of 39°C . Name the resulting preparation.

- A. Anatoxin
- B. Immunoglobulin
- C. Antitoxic serum
- D. Adjuvant
- E. Inactivated vaccine

6. Hormones regulate numerous metabolic processes. What hormone activates glycogen synthesis?

- A. Insulin
- B. Adrenaline
- C. Vasopressin
- D. Thyroxine
- E. Oxytocin

7. An iron(III) hydroxide sol is positively charged. What ion has the lowest coagulation threshold in this sol?

- A. SO_4^{2-}
- B. Cl^-
- C. Cu^{2+}
- D. Na^+
- E. J^-

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

- A. *Dryopteris filix-mas*
- B. *Potentilla erecta*
- C. *Convallaria majalis*
- D. *Elymus repens*
- E. *Acorus calamus*

9. Name the order, in which leukocytes emigrate to the inflammation focus.

- A. Neutrophilic granulocytes, monocytes, lymphocytes
- B. Monocytes, lymphocytes, neutrophilic granulocytes
- C. Neutrophilic granulocytes, lymphocytes, monocytes
- D. Monocytes, neutrophilic granulocytes, lymphocytes
- E. Lymphocytes, monocytes, neutrophilic granulocytes

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

- A. Sulfanilic
- B. Hydrochloric
- C. Acetic
- D. Oxalic
- E. Sulfuric

11. What method is used for gravimetric determination of moisture in pharmaceuti-

cal products?

- A. Indirect volatilization
- B. Particulate gravimetry
- C. Precipitation
- D. Direct volatilization
- E. Particulate gravimetry and direct volatilization

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

- A. Concentration galvanic cell
- B. Chemical galvanic cell
- C. Galvanic cell with ionic transport
- D. Galvanic cell without ionic transport
- E. Reversible galvanic cell

13. For annual influenza prevention, "Influvac" type vaccines are used. These vaccines contain components of virion envelope. What type of vaccines is it?

- A. Subunit
- B. Anatoxin
- C. Recombinant
- D. Live
- E. Anti-idiotypic

14. An accurate dosage is necessary when taking medicinal mixtures. For this purpose, the following is added into suspensions as a stabilizer:

- A. Gelatin
- B. Sodium chloride
- C. Glucose
- D. Ethanol
- E. Starch

15. During the blooming season, a 45-year-old woman developed an acute inflammatory disease of her upper airways and eyes with hyperemia, edema, and mucus discharge. What type of leukocytosis is the most characteristic in this case?

- A. Eosinophilia
- B. Neutrophilia
- C. Monocytosis
- D. Basophilia
- E. Lymphocytosis

16. What pathogenicity factor of staphylococci causes toxic infection syndrome?

- A. Enterotoxin
- B. Hemolysin
- C. Exfoliative toxin
- D. Hyaluronidase
- E. Protein A

17. What type of hypoxia develops in cases of carbon monoxide poisoning?

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

18. Name the process, during which a chemical interaction occurs between the adsorbate molecules and the active sites of the adsorbent.

- A. Chemosorption
- B. Adsorption
- C. Solvation
- D. Desorption
- E. Sublimation

19. What substance causes impaired biotin absorption?

- A. Avidin
- B. Albumin
- C. Globulin
- D. Transferrin
- E. Ferritin

20. A 50-year-old man was hospitalized in a severe condition. Objectively, his skin and visible mucosa are cyanotic, arterial blood saturation — 88%, blood pressure — 90/60 mm Hg, pulse — 117/min., respiratory rate — 22/min. The patient has a history of chronic heart failure. What type of hypoxia has developed in the patient?

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

21. A patient developed candidiasis caused by long-term antibiotic treatment. What drug should be used in this case to eliminate candidiasis?

- A. Nystatin
- B. Fumagillin
- C. Rubomycin (Daunorubicin)
- D. Sulfadimezin (Sulfadimidine)
- E. Interferon

22. Gastric secretory function of a patient was analyzed. No hydrochloric acid and no enzymes were detected in the patient's gastric juice. Name this health condition.

- A. Achylia
- B. Hyperchlorhydria
- C. Hypochlorhydria
- D. Achlorhydria
- E. Hypoaciditas

23. What method is based on the reactions of halide precipitation in the form of sparingly soluble mercury(I) salts?

- A. Mercurimetry
- B. Argentometry
- C. Rodanometry
- D. Permanganatometry
- E. Trilonometry

24. Microscopy of *Papaver somniferum* pericarp revealed tubular structures with white latex. Name these structures.

- A. Laticifers
- B. Secretory glandules
- C. Lysigenous cavities
- D. Secretory cells
- E. Schizogenous ducts

25. What electrophilic reagent is used for sulfonation of pyrrole and furan?

- A. Pyridine-sulfur trioxide complex
- B. Concentrated sulfuric acid
- C. Diluted sulfuric acid
- D. Mixture of sulfuric acid and nitric acid
- E. Oleum

26. Foams belong to the following type of disperse systems:

- A. Bound disperse systems
- B. Colloidal dispersion systems
- C. Ion-molecular systems
- D. Hydrosols
- E. Fibrillar systems

27. During the assessment of air purity in the aseptic unit of a pharmacy, a sedimentation test has been conducted. The test resulted in growth of small colonies with zones of hemolysis. What medium was used for inoculation in this case?

- A. Blood agar
- B. Levine formulation (eosin methylene blue agar)
- C. Endo agar
- D. Ploskirev agar
- E. Egg yolk salt agar

28. A patient diagnosed with acute left ventricular failure developed pulmonary edema. What disturbance of peripheral circulation in the lungs is the cause of this complication?

- A. Venous hyperemia
- B. Neurotonic arterial hyperemia
- C. Neuroparalytic arterial hyperemia
- D. Pulmonary artery thrombosis
- E. Ischemia

29. What cations of the IV analytical group (acid-base classification) do not form a precipitate when heated with an excess alkali and hydrogen peroxide solution and the solution becomes yellow-colored in the process?

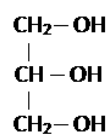
- A. Chromium(III) cations
- B. Tin(II) cations
- C. Tin(IV) cations
- D. Zinc cations
- E. Aluminum cations

30. Insulin is a pancreatic hormone with hypoglycemic action. Chemically, it can be classified as a:

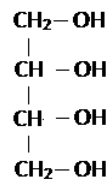
- A. Polypeptide
- B. Nucleotide
- C. Steroid
- D. Carbohydrate
- E. Lipid

31. What alcohol is a component of fats?

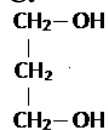
A.



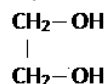
B.



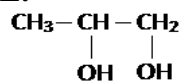
C.



D.



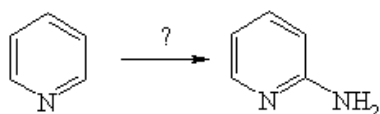
E.



32. What substance can be used to prepare primary standard solutions of titrants?

- A. $\text{K}_2\text{Cr}_2\text{O}_7$
- B. NaOH
- C. I_2
- D. KMnO_4
- E. HCl

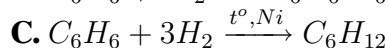
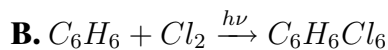
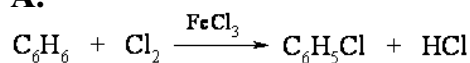
33. What reagent must interact with pyridine to obtain 2-aminopyridine?



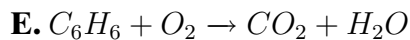
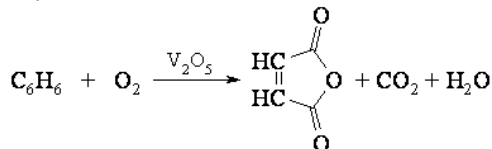
- A. Sodium amide
- B. Ammonia
- C. Ammonium hydroxide
- D. Ammonium chloride
- E. Hydrazine

34. What reaction is a substitution reaction?

A.



D.

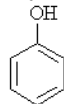


35. After a surgery, severe pain syndrome was observed in the patient. What change in the patient's hormonal status can be expected in this case?

- A. Increased catecholamine production
- B. Insulin hypersecretion
- C. Decreased ACTH production
- D. Decreased production of glucocorticoids
- E. Decreased production of mineralocorticoids

36. What compound forms an azo dye with benzenediazonium chloride?

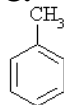
A.



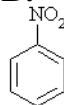
B.



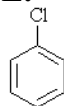
C.



D.



E.



37. What titration method should be used for determination of a volatile substance?

- A. Back titration
- B. Direct titration
- C. Substitution titration
- D. Titration with instrumentally fixed equivalence point
- E. Titration of separate sample weights

38. To induce an artificially acquired active immunity, a 3-month-old child was given orally a Sabin strain-based live cultural vaccine. This vaccine is used for prevention of:

- A. Poliomyelitis
- B. Tuberculosis
- C. Measles
- D. Rubella
- E. Parotitis

39. To determine the type of botulinum toxin, a reaction of toxin neutralization with antitoxin can be performed on laboratory mice. Name this research method.

- A. Biological method
- B. Microscopy
- C. Allergy testing
- D. Microbiological method
- E. —

40. After examination, the child was diagnosed with scarlet fever. What microorganism is the causative agent of this disease?

- A. Streptococcus
- B. Staphylococcus
- C. Meningococcus
- D. Klebsiella
- E. Actinomycete

41. A sodium hydroxide solution and a hydrogen peroxide solution were added into an unknown mixture, which resulted in formation of a precipitate. However, the precipitate disappeared, when these substances were added in excess. It indicates the presence of cations of the following analytical group:

- A. IV
- B. V
- C. VI
- D. II
- E. III

42. Why should hydrogen peroxide be added along with the group reagent in systematic analysis of group IV cations?

- A. For formation of hydroxo- and oxoanions of these elements at the highest oxidation degrees
- B. For formation of hydroxo- and oxoanions of these elements at the lowest oxidation degrees
- C. For more complete precipitation of these cations
- D. For formation of peroxide compounds of these cations
- E. For breakdown of hydrate complexes

43. Hydrosols of sulfur, cholesterol, and rosin (colophony) are obtained by adding alcohol solutions of these substances to water. What method is used to obtain these sols?

- A. Solvent replacement
- B. Double-replacement reaction
- C. Hydrolysis reaction
- D. Condensation from vapor
- E. Oxidation reaction

44. A man has acute glomerulonephritis. Because of oliguria, water retention is observed in his body. What abnormality of the total blood volume is most likely to be detected in this patient?

- A. Oligocythemic hypervolemia
- B. Polycythemic hypervolemia
- C. Oligocythemic normovolemia
- D. Simple hypervolemia
- E. Simple hypovolemia

45. Name the male gametophyte of flowering plants.

- A. Pollen grains
- B. Carpel
- C. Embryo sac
- D. Ovule
- E. Nucellus

46. The material obtained from a patient with suspected acute *Salmonella*-induced gastroenteritis was sent to a bacteriological laboratory. What should be used in this case for serological identification of the isolated pure bacterial culture?

- A. Agglutinating diagnostic serum for salmonellosis
- B. Live pure culture of *Salmonella*
- C. Salmonellosis diagnosticum
- D. Erythrocytic salmonellosis diagnosticum
- E. Patient's blood serum

47. In pharmaceutical manufacturing, rutin and quercetin are obtained from the flowers of a certain *Fabaceae* family plant. Name this plant.

- A. *Styphnolobium japonicum*
- B. *Robinia pseudoacacia*
- C. *Caragana arborescens*
- D. *Astragalus piletocladus*
- E. *Acacia dealbata*

48. The *Embryophyta* subkingdom (higher plants) includes mainly terrestrial organisms, represented by various life forms (grasses, shrubs, subshrubs, trees, etc.). What division of higher plants includes only shrubs and trees?

- A. *Pynophyta*
- B. *Magnoliophyta*
- C. *Bryophyta*
- D. *Lycopodiophyta*
- E. *Polypodiophyta*

49. *Quercus robur* leaves have the following type of lamina shape and division:

- A. Pinnatilobate
- B. Tripartite
- C. Pinnatipartite
- D. Palmatilobate
- E. Palmatipartite

50. Examination of the smears prepared from the patient's cerebrospinal fluid detected Gram-negative bean-shaped diplococci that were located inside the leukocytes. Name the likely causative agent.

- A. Meningococcus
- B. Gonococcus
- C. Staphylococcus
- D. Rickettsia
- E. Streptococcus

51. The patient's feces were inoculated into an alkaline peptone medium. Six hours later there was observed growth of the causative agent that manifested as a bluish film. The smear contains curved bacilli. Name the likely causative agent.

- A. *Vibrio cholerae*
- B. *Mycobacterium tuberculosis*
- C. *Pseudomonas aeruginosa*
- D. *Salmonella enterica* serovar *Typhi*
- E. *Escherichia coli*

52. What nutrient medium should be used by a laboratory technician to determine the total fungal count in a soft dosage form?

- A. Sabouraud agar
- B. Meat peptone agar
- C. Mannitol salt agar
- D. Bismuth sulfite agar
- E. Endo medium

53. During a sanitary-microbiological analysis of the soil, the number of sanitary indicative microorganisms must be determined. Name these microorganisms.

- A. *Streptococcus faecalis*, *E.coli*, *Clostridium perfringens*
- B. *Streptococcus haemolyticus*, *Streptococcus faecalis*
- C. *Candida* fungi, *Streptococcus faecalis*
- D. *Streptococcus faecalis*, *Clostridium perfringens*
- E. *Staphylococcus aureus*, *Clostridium perfringens*

54. What is contained in attenuated vaccines?

- A. Live microbes
- B. Dead microbes
- C. Anatoxin
- D. Dead microbes and anatoxin
- E. Immunoglobulins

55. *Chlorophyta* division representatives have chromatophores of various shapes in their cells. What genus includes species with ribbon-shaped chromatophores?

- A. *Spirogyra*
- B. *Volvox*
- C. *Chlorella*
- D. *Chlamidomonas*
- E. *Spirulina*

56. Every year in autumn, a coniferous gymnosperm undergoes a fall of soft needles that grow on short shoots. It is characteristic of the following genus:

- A. *Larix*
- B. *Cedrus*
- C. *Abies*
- D. *Picea*
- E. *Pinus*

57. The fruit of *Raphanus raphanistrum* is formed by two carpels, with their edges fused together. It forms a pseudolamina with seeds attached to both sides of this membranous partition. When ripe, the fruit falls apart, separating transversely into segments. This type of fruit is called:

- A. Segmented silique
- B. Disk-shaped schizocarp
- C. Coenobium
- D. Capsule
- E. Double samara

58. These plants have storage roots and ridged hollow stalks, their flowers are gathered into compound umbels and their fruits are schizocarpic cremocarps with

essential oil ducts. They belong to the following family:

- A. *Apiaceae*
- B. *Rosaceae*
- C. *Musaceae*
- D. *Fabaceae*
- E. *Cucurbitaceae*

59. Fatty acids synthesis occurs in human body. What compound is initial in this synthesis?

- A. Acetyl coenzyme A
- B. Vitamin C
- C. Glycine
- D. Succinate
- E. Cholesterol

60. A patient complains of pain in his right leg. During foot examination, his foot is pale, diminished in size, and exhibits a local decrease in temperature. What disturbance of local blood circulation is observed in this patient?

- A. Ischemia
- B. Venous hyperemia
- C. Neurotonic arterial hyperemia
- D. Neuroparalytic arterial hyperemia
- E. Metabolic arterial hyperemia

61. A 47-year-old man diagnosed with bilateral pneumonia presents with an acid-base imbalance — compensated gaseous acidosis. What defensive and adaptive mechanism maintains compensation of the acid-base imbalance in this patient?

- A. Intensification of acidogenesis in the kidneys
- B. Pulmonary hyperventilation development
- C. Decreased hydrocarbonate reabsorption in the kidneys
- D. Vomiting
- E. Diarrhea

62. Extemporaneous preparation of solutions for injections requires quality control of their sterilization. What is placed into the sterilization chamber of an autoclave for control purposes?

- A. Ampoule with microbial spores
- B. Ampoule with staphylococcus culture
- C. Ampoule with colibacillus culture
- D. Ampoule with fungal spores
- E. Ampoule with viruses

63. In a fir tree, the apical bud continues to grow as a central leader shoot, while the lateral buds produce lateral shoots. It is characteristic of the following type of

branching:

- A. Monopodial
- B. Dichotomous
- C. Sympodial
- D. Columnar
- E. Pseudodichotomous

64. What fruits are apocarpous?

- A. Aggregate drupe, follicetum
- B. Capsule, berry
- C. Bean, single nutlet
- D. Apple, acorn
- E. Cremocarp, disk-shaped schizocarp

65. What optical method of analysis is used for quantification of Fe(III) ions?

- A. Photocolorimetry
- B. Polarimetry
- C. Conductometry
- D. Potentiometry
- E. Coulometry

66. What pair of electrodes is used for potentiometric titration of acids and bases in non-aqueous solutions?

- A. Glass, silver chloride
- B. Hydrogen, platinum
- C. Quinhydrone, platinum
- D. Antimony, glass
- E. Two platinum electrodes

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

- A. Salting out
- B. Syneresis
- C. Thixotropy
- D. Coacervation
- E. Solvation

68. What substance undergoes solubilization in a concentrated aqueous soap solution (sodium stearate)?

- A. Neutral fat
- B. Calcium chloride
- C. Glucose
- D. Water
- E. Ethanol

69. Ranitidine was prescribed to a patient with gastric ulcer. What is the mechanism of action of this drug?

- A. Blockade of H_2 -histamine receptors
- B. Blockade of H_1 -histamine receptors
- C. Blockade of M-cholinergic receptors
- D. Suppression of activity of H^+/K^+ -ATP-ase
- E. Blockade of H-cholinergic receptors of vegetative ganglia

70. Due to prolonged taking of phenobarbital, an epileptic patient has developed tolerance to this drug. What is this phenomenon based on?

- A. Biotransformation acceleration
- B. Absorption process weakening
- C. Receptor sensitivity increase
- D. Biotransformation inhibition
- E. Substance accumulation in the body

71. What side effect is characteristic of captopril?

- A. Dry cough
- B. Increased arterial pressure
- C. Hyperglycemia
- D. Heart rhythm disorder
- E. Red urine

72. What drug has a hypoglycemic effect because it stimulates pancreatic β -cells?

- A. Glibenclamide
- B. Prednisolone
- C. Adrenaline hydrochloride (Epinephrine)
- D. Retabolil (Nandrolone)
- E. Heparin

73. What short-acting loop diuretic can cause significant hypokalemia?

- A. Furosemide
- B. Mannitol
- C. Spironolactone
- D. Amiloride
- E. Triamterene

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

- A. Peptization
- B. Colloidal protection
- C. Heterocoagulation
- D. Flocculation
- E. Micelle formation

75. For two weeks, a man has been taking tetracycline without a doctor's prescription for treatment of furunculosis. A yellowish color of the skin and sclera is observed in this man. When interviewing this person, a pharmacist determined that his condition developed after taking the medicines. What type of jaundice has developed in

this case?

- A. Hepatic
- B. Subhepatic
- C. Hemolytic
- D. Cholestatic
- E. Hereditary

76. In acidimetry, titrants are prepared using the method of determined titer. What substance is used for their standardization according to the State Pharmacopoeia of Ukraine?

- A. Sodium carbonate
- B. Sodium chloride
- C. Potassium chloride
- D. Metallic zinc
- E. Metallic iron

77. What ion is present in a solution if its reaction with diphenylamine in the presence of concentrated sulfuric acid results in blue coloring?

- A. Nitrate
- B. Phosphate
- C. Acetate
- D. Sulfide
- E. Sulfate

78. A 62-year-old woman with transmural myocardial infarction has developed heart failure. What is the pathogenetic mechanism of heart failure development in this case?

- A. Decreased mass of functioning cardiomyocytes
- B. Myocardial reperfusion injury
- C. Acute cardiac tamponade
- D. Volume overload of the heart
- E. Pressure overload of the heart

79. As a result of prolonged fasting, carbohydrate stores in the human body disappear rapidly. What metabolic reactions maintain blood glucose levels in this case?

- A. Gluconeogenesis
- B. Aerobic glycolysis
- C. Anaerobic glycolysis
- D. Pentose-phosphate pathway
- E. —

80. Isoniazid is a drug with anti-tuberculosis effect. It is an anti-vitamin of:

- A. Nicotinic acid
- B. Pantothenic acid
- C. Ascorbic acid
- D. Riboflavin
- E. Tocopherol

81. Activation of lipid peroxidation is

one of the mechanisms that damage bi-structures and cause development of cellular pathologies. What compound takes part in neutralization of organic peroxides?

- A. Glutathione
- B. Taurine
- C. Glycine
- D. Alanin
- E. Methionine

82. Mutation in the gene that controls the synthesis of β -chain results in formation of abnormal hemoglobin forms. Select the mutant hemoglobin from the list.

- A. *HbS*
- B. *HbF*
- C. *HbA*
- D. *HbA2*
- E. *HbA1*

83. A certain natural heteropolysaccharide anticoagulant is widely used in pharmaceutical practice. Name this anticoagulant.

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

84. To treat alcoholism in a patient, the doctor used the mechanism for suppressing ethanol addiction that amplifies the toxic effect of alcohol. What ethanol oxidation product is neurotoxic?

- A. Acetaldehyde
- B. Pyruvate
- C. Lactate
- D. Carbon dioxide
- E. Ammonia

85. A patient with essential hypertension takes diuretics as prescribed by the doctor. What imbalances of water-salt metabolism can develop in this case?

- A. Hypokalemia
- B. Hyperkalemia
- C. Hypernatremia
- D. Hypoglycemia
- E. Hypercalcemia

86. Because of protracted diarrhea, a 5-year-old child developed vision disorders, frequent inflammations of oral mucosa, and conjunctivitis, which can indicate developing hypovitaminosis of vitamin:

- A. A
- B. PP
- C. B₁
- D. B₂
- E. B₆

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

- A. PO_4^{3-}
- B. Al^{3+}
- C. K^+
- D. SO_4^{2-}
- E. Cl^-

88. A woman has accidentally cut her skin. Twenty minutes later she noticed that the wound did not stop bleeding. What vitamin is absent or deficient in this case, causing this condition?

- A. K
- B. A
- C. D
- D. E
- E. PP

89. A child with type 1 diabetes mellitus made an insulin injection on an empty stomach. Fifteen minutes later the child developed acute hunger, tremor, excessive sweating, and dizziness. What has caused this condition in the child?

- A. Hypoglycemia
- B. Hyperglycemia
- C. Ketonemia
- D. Hyperlipemia
- E. Glucosuria

90. The enzymes of medicinal substance metabolism that require monooxygenase reactions of biotransformation are localized in the cells mainly in the:

- A. Microsomes of the endoplasmic reticulum
- B. Mitochondria
- C. Lysosomes
- D. Cytosol
- E. Nucleus

91. What diuretic reduces excretion of uric acid?

- A. Hydrochlorothiazide
- B. Furosemide
- C. Verospiron (Spironolactone)
- D. Mannitol
- E. Acetazolamide

92. What antiarrhythmic drug blocks sodium channels?

- A. Lidocaine
- B. Cordarone (Amiodarone)
- C. Nifedipine
- D. Propranolol
- E. Verapamil

93. What drugs have the most pronounced antisecretory effect?

- A. Proton pump inhibitors
- B. Histamine H₂-receptor antagonists
- C. Selective anticholinergics
- D. Antacids
- E. De-Nol (Bismuth subcitrate)

94. Treatment with sodium bromide has resulted in the development of bromism in the patient. This health condition manifests as rhinitis, cough, conjunctivitis, and skin rashes. What should the patient be prescribed to eliminate this condition?

- A. Sodium chloride
- B. Potassium chloride
- C. Sodium iodide
- D. Calcium chloride
- E. Sodium sulfate

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

- A. It acts as a muscarinic antagonist
- B. It is contraindicated for elderly patients
- C. It increases blood pressure
- D. It acts as a muscarinic agonist
- E. It acts as an α -blocker

96. A man in a state of hypertensive crisis was intravenously administered a drug that caused a short-term increase in pressure, followed by a pressure decrease. What drug was administered in this case?

- A. Clophelin (Clonidine)
- B. Anaprilin (Propranolol)
- C. Enalapril
- D. Nitroglycerine
- E. Nifedipine

97. ACE inhibitors cannot be used simultaneously with a certain group of diuretics. Name this group of diuretics.

- A. Potassium-sparing diuretics
- B. Loop diuretics
- C. Thiazide diuretics
- D. Osmotic diuretics
- E. Carbonic anhydrase inhibitors

98. What non-steroidal anti-inflammatory drugs selectively block COX-2?

- A. Meloxicam, Nimesulide
- B. Ortophen, Voltaren
- C. Indomethacin, Diclofenac sodium
- D. Ibuprofen, Ketoprofen
- E. Mefenamic acid, Naproxen

99. What antidote is used to treat heparin overdose?

- A. Protamine sulfate
- B. Aminocaproic acid
- C. Vicasol (Menadione)
- D. Fibrinogen
- E. Neodicoumarin

100. Atropine sulfate belongs to the following group of drugs:

- A. Muscarinic antagonists
- B. Nicotinic antagonists
- C. α -adrenergic agonists
- D. β -adrenergic agonists
- E. Tranquilizers

101. A woman, who for a long time had been taking a barbiturate drug to treat her insomnia, decided to stop taking this drug. Soon after that, the patient developed aggression, irritability, tremors, loss of appetite, orthostatic hypotension, and impaired vision. What side effect of the drug has caused these symptoms in the patient?

- A. Withdrawal
- B. Tachyphylaxis
- C. Sensitization
- D. Cumulation
- E. Teratogenicity

102. A patient was prescribed a 2% antiseptic solution for treatment of burns. When this antiseptic interacts with tissues, manganese dioxide is produced. The antiseptic has an astringent and anti-inflammatory effect. Name this drug.

- A. Potassium permanganate
- B. Hydrogen peroxide
- C. Lugol's solution
- D. Phenol
- E. Brilliant green

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

- A. Vicasol (Menadione)
- B. Thrombin
- C. Aminocaproic acid
- D. Phenylin (Phenindione)
- E. Contrykal (Aprotinin)

104. To improve the effect of a bioactive substance on a lesion focus, the emulsion dosage form is used. Emulsions can be prepared by comminution of liquid substances in a liquid medium. What is the name of this process?

- A. Dispersion
- B. Condensation
- C. Sedimentation
- D. Peptization
- E. Coagulation

105. Duodenal administration of a certain drug causes reflex contraction of the gallbladder and relaxation of the Oddi's sphincter. When administered intravenously, it has a sedative, anti-convulsant, and antispasmodic effect. Name this drug.

- A. Magnesium sulfate
- B. Gidazepam
- C. Cholosas
- D. Ursofalk (ursodeoxycholic acid)
- E. Atropine sulfate

106. Phenolphthalein indicator is often used in titrimetric analysis. What titration method uses this indicator?

- A. Acid-base titration
- B. Redox titration
- C. Precipitation titration
- D. Complexometric titration
- E. Permanganometry

107. A 20-year-old woman was hospitalized unconscious. She has a 5-year-long history of type 1 diabetes mellitus. During examination, her blood plasma glucose levels were 1.8 mmol/L. What is the most likely cause of hypoglycemic coma in this patient?

- A. Insulin overdose
- B. Untimely administration of insulin
- C. Administration of sulfonyleureas
- D. Administration of biguanides
- E. Disturbed sleep schedule

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

- A. Ticlopidine
- B. Heparin
- C. Neodicoumarin (ethyl biscoumacetate)
- D. Phenilin (Phenindione)
- E. Streptokinase

109. What is the type of leaf attachment to the stem in *Papaver somniferum*?

- A. Clasping
- B. Sheathing
- C. Auriculate
- D. Perfoliate
- E. Ochreate

110. In pharmaceutical technology, analysis of the phase diagram of systems is of practical importance. What type of equilibrium is characterized by the figurative point on the phase diagram of water?

- A. One-component, three-phase, non-variant
- B. One-component, two-phase, non-variant
- C. Two-component, two-phase, one-variant
- D. Two-component, one-phase, one-variant
- E. One-component, one-phase, non-variant

111. An analytical chemist conducts a qualitative analysis of phosphate ions, using a pharmacopoeial reaction that produced a yellow precipitate as a result. What reagent did the chemist use in this case?

- A. Silver nitrate
- B. Sodium nitrate
- C. Potassium chloride
- D. Potassium nitrate
- E. Hydrochloric acid

112. What *Brassicaceae* family plant has a cardiogenic effect?

- A. *Erysimum diffusum*
- B. *Adonis vernalis*
- C. *Leonurus cardiaca*
- D. *Capsella bursa-pastoris*
- E. *Rheum tanguticum*

113. What plant develops a crown of basal leaves in the first year of its life and blooms and produces fruits in the second year of its life, after which it dies?

- A. Biennial herbaceous plant
- B. Annual herbaceous plant
- C. Perennial herbaceous plant
- D. Perennial shrub
- E. Perennial prostrate shrub

114. Salts of an unknown cation, when brought into the flame of a burner, change the flame color to brick-red. What cation is it?

- A. Calcium
- B. Ammonium
- C. Magnesium
- D. Manganese
- E. Lead

115. Why must iodometric determination be performed in cold conditions?

- A.** When heated, iodine becomes more volatile and the sensitivity of starch indicator decreases
B. Reactions with iodine become less selective during heating
C. When heated, iodine decomposes to form atomic iodine
D. When heated, iodine reacts with water to form hypoiodous acid (*HIO*)
E. When heated, iodine can be easily oxidized by atmospheric oxygen

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

- A.** Limited proteolysis
B. Phosphorylation
C. Decarboxylation
D. Addition of a metal cation
E. Transamination

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

- A.** Prozerin (Neostigmine)
B. Physostigmine salicylate
C. Galantamine hydrobromide
D. Diproxime (Trimedoxime bromide)
E. Isonitrozone

118. At what temperature should the determination be carried out in refractometric method of analysis?

- A.** 20°C
B. 18°C
C. 23°C
D. 25°C
E. 28°C

119. What is the mechanism of indirect action of ionizing radiation on cells?

- A.** Formation of a large number of free radicals
B. Chromosome rupture
C. Damage to the cytoplasmic membrane
D. Swelling of organelles
E. Activation of protein biosynthesis

120. A man's diet consists mostly of fatty foods. What enzyme should he be prescribed to normalize his digestive processes?

- A.** Lipase
B. DNase
C. Hyaluronidase
D. Maltase
E. Catalase

121. Chemical equilibrium theory allows predicting the approaches that result in the maximum yield of medicines. What factor has no effect on the chemical equilibrium shift?

- A.** Addition of a catalyst
B. Pressure change
C. A change in the concentration of the initial substances
D. Temperature change
E. A change in the concentration of products

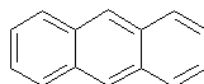
122. After a physical exertion a person developed extra (premature) cardiac contractions. What type of arrhythmia is it?

- A.** Extrasystole
B. Sinus tachycardia
C. Sinus bradycardia
D. Ventricular fibrillation
E. Paroxysmal tachycardia

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

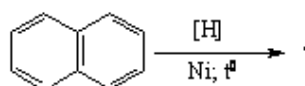
- A.** Ammonium and mercury(I) ions
B. Ammonium and lead(II) ions
C. Ammonium and calcium ions
D. Ammonium and mercury(II) ions
E. Ammonium and stanium(II) ions

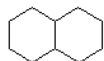
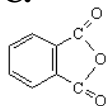
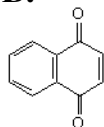
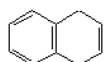
124. What must be the numerical value of n , for Huckel's rule ($4n+2$) to apply to anthracene?



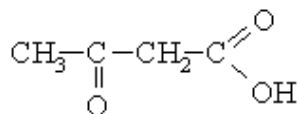
- A.** $n = 3$
B. $n = 0$
C. $n = 1$
D. $n = 2$
E. $n = 10$

125. What compound forms after complete hydrogenation of naphthalene?



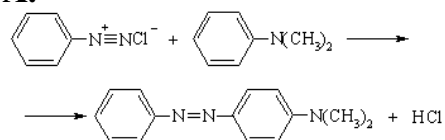
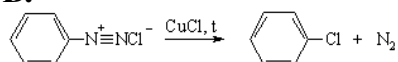
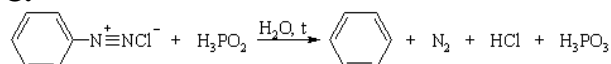
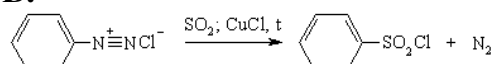
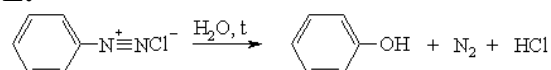
A.**B.****C.****D.****E.**

126. What is the IUPAC name of the compound given below?



- A.** 3-Oxobutanoic acid
- B.** Butyric acid
- C.** Butyraldehyde
- D.** β -Ketopropionic acid
- E.** —

127. Select an azo coupling reaction among the reactions given below.

A.**B.****C.****D.****E.**

128. Some vegetables and fruits (carrots, tomatoes, apricots) are rich in a substance that in the human body acts as an anti-oxidant and is a provitamin of vitamin A. Name this substance.

- A.** β -carotene
- B.** Cholesterol
- C.** Methionine
- D.** Choline
- E.** Inositol

129. What gas decolorizes bromine water?

- A.** Ethen
- B.** Ethane
- C.** Methane
- D.** Propane
- E.** Butane

130. Ion-exchange adsorption is widely used for water softening and demineralization. Through what ionite columns should the water be passed for its demineralization?

A. Through the cationite in the RH-form, and then through the anionite in the ROH-form

B. Through the cationite in the RK-form, and then through the anionite in the ROH-form

C. Through the cationite in the RH-form, and then through the cationite in the RK-form

D. Through the anionite in the ROH-form, and then through the cationite in the R2Ca-form

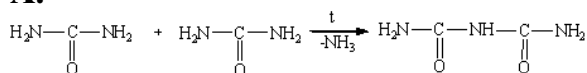
E. Through the anionite in the R2SO4-form, and then through the cationite in the ROH-form

131. An analytical chemist conducts qualitative analysis of IV group cations. What reagent can be used to determine zinc?

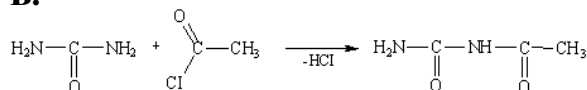
- A.** Dithizone
- B.** Thiourea
- C.** Diphenylamine
- D.** Murexide
- E.** Alizarin

132. Select the biuret formation scheme among the listed reactions.

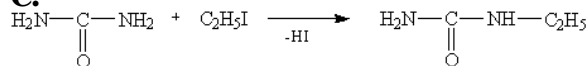
A.



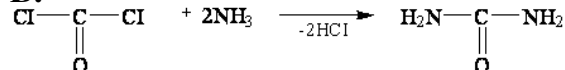
B.



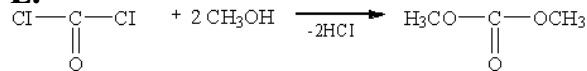
C.



D.



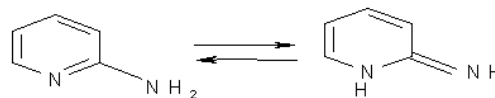
E.



133. A 30-year-old woman complains of increased sweating, tachycardia, weight loss, tremor, irritability, and exophthalmos. What endocrine pathology can cause this condition?

- A.** Hyperthyroidism
- B.** Hypothyroidism
- C.** Hypogonadism
- D.** Hypergonadism
- E.** Hyperaldosteronism

134. What type of tautomerism is characteristic of 2-aminopyridine?



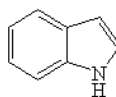
- A.** Amine-imine tautomerism
- B.** Lactam-lactim tautomerism
- C.** Tautomerism of azoles
- D.** Keto-enol tautomerism
- E.** Ring-chain tautomerism

135. Increased concentration of active oxygen forms is a mechanism of pathogenesis in a number of diseases. What antioxidant is usually prescribed to prevent this process?

- A.** α -tocopherol
- B.** Glucose
- C.** Calciferol
- D.** Cobalamine
- E.** Glycerol

136. Select the indole formula among the listed structural formulas of organic compounds.

A.



B.



C.



D.



E.



137. What compound forms as a result of the reaction between phenol and an aqueous solution of bromine?

- A. 2,4,6-Tribromophenol
- B. 2,5-Dibromophenol
- C. m-Bromophenol
- D. 3,5-Dibromophenol
- E. 2,4,5-Tribromophenol

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

- A. Saturated solution of sodium hydrogencarbonate
- B. Nitric acid solution
- C. Sulfuric acid solution
- D. Ammonia solution
- E. Acetic acid solution

139. Which one of the listed compounds is an alicyclic hydrocarbon?

- A. Cyclohexene
- B. Phenanthrene
- C. Naphthalene
- D. Benzene
- E. Anthracene

140. "Collargol" pharmaceutical preparation is a colloidal solution of silver that contains a high-molecular compound. What is the function of this compound?

- A. Increases aggregate stability
- B. Induces coagulation
- C. Facilitates sedimentation
- D. Decreases aggregate stability
- E. Increases degree of dispersion

141. A herbaceous plant has upright stems, branching in their upper part. The leaves and flowers contain dark cavities. The inflorescence is an apical corymb with yellow flowers. The fruit is a trihedral capsule. This description is characteristic of:

- A. *Hypericum perforatum*
- B. *Ledum palustre*
- C. *Thea sinensis*
- D. *Capsella bursa-pastoris*
- E. *Althaea officinalis*

142. What serological reaction is used in bacteriological laboratories to determine the toxigenicity of *Corynebacterium diphtheriae*?

- A. Precipitation in gel
- B. Agglutination
- C. Neutralization
- D. Complement fixation
- E. Indirect hemagglutination

143. Interferons have the properties of antiviral antibiotics and natural antitumor

factors, which is why they are widely used in medical practice. Their protective effects are realized by influencing a certain stage of protein biosynthesis. Name this stage.

- A. Translation initiation
- B. Translation elongation
- C. Translation termination
- D. Transcription initiation
- E. Transcription termination

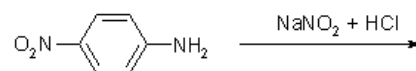
144. Ammonia is a toxic substance that is especially dangerous for the brain. In the human body, the main product of ammonia neutralization and excretion is urea. Name the process of urea synthesis.

- A. Krebs ornithine cycle
- B. Citric acid cycle
- C. Cori cycle
- D. Linen cycle
- E. Shemin-Rittenberg cycle

145. What reaction is used to obtain butane $CH_3 - CH_2 - CH_2 - CH_3$ from chloroethane $CH_3 - CH_2 - Cl$?

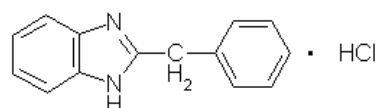
- A. Wurtz reaction
- B. Kucherov reaction
- C. Konovalov reaction
- D. Zinin reaction
- E. Finkelstein reaction

146. What reaction corresponds with the scheme given below?



- A. Diazotization
- B. Azo coupling
- C. Isonitrile test
- D. Amination
- E. Reduction

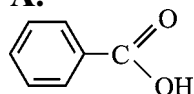
147. Dibazol (Bendazol) is a hypotensive antispasmodic drug. Its mechanism of action is based on its ability to block phosphodiesterase type 4 enzyme activity. What heterocycle is a component of Dibazol structure?



- A. Benzimidazole
- B. Benzene
- C. Thiazole
- D. Pyridine
- E. Pyrimidine

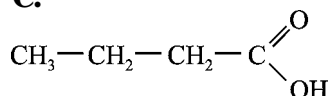
148. What acid can be classified as an aromatic monocarboxylic acid?

A.



B. $HOOC-CH=CH-COOH$

C.

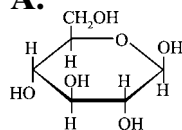


D. $HOOC-CH_2-CH_2-COOH$

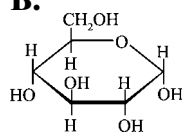
E. $CH_2=CH-COOH$

149. Which formula corresponds with β -D-glucopyranose?

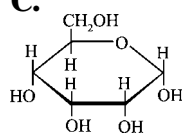
A.



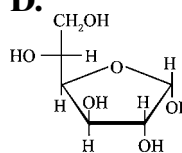
B.



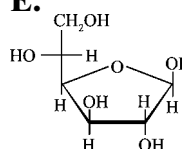
C.



D.



E.



150. What reagents allow confirming the presence of a primary amino group in the molecule of *n*-aminobenzoic acid, if isonitrite test is used?

- A. $CHCl_3, NaOH$
- B. Br_2, H_2O
- C. $NaHCO_3$
- D. $KMnO_4$
- E. $I_2, NaOH$