

MINISTRY OF PUBLIC HEALTH OF UKRAINE

Department of human resources policy, education and science

Testing Board

Student ID										Last name									

Variant _____

Test items for licensing examination

Krok 1

PHARMACY



General Instruction

Every one of these numbered questions or unfinished statements in this chapter corresponds to answers or statements endings. Choose the answer (finished statements) that fits best and fill in the circle with the corresponding Latin letter on the answer sheet.

Authors of items: Abramov A.V., Akimova Z.I., Aleksyeyenko O.V., Andronov D.YU., Anosova L.S., Babak V.V., Bilik O.V., Bilov I.YE., Bodnarchuk O.V., Bolokhovska T.O., Bondarenko YU.I., Bordyaciivska L.I., Bricka V.S., Cherneha H.V., Chornous V.O., Didenko N.O., Dmytriv A.M., Dudka N.M., Dynnik K.V., Fedorovich I.P., Filimonova N.I., Havrilyuk I.M., Halinska V.I., Halkevich V.D., Hlushkova O.M., Hrischenko L.I., Hudivok YA.S., Hurmak I.S., Ivanec L.M., Ivanov E.I., Ivanova S.A., Ilchenko M.O., Kaluhina S.M., Kazmirchuk H.V., Khara M.P., Khlus K.M., Khmelnikova L.I., Kischuk B.M., Klepa T.I., Klopockyi G.A., Kobilinska L.I., Koldunov V.V., Kolesnik V.P., Kolesnikova T.O., Kononova I.I., Kordon YU.V., Korniyevskiy YU.I., Korolyuk V.D., Kravec D.S., Kovalenko I.M., Kremenska L.V., Krizhanovska A.V., Krushinska T.YU., Krykliva S.D., Kucyk R.V., Kukurychkin YE.R., Kuznyecova V.M., Kyschkan I.H., Lemke M.O., Lisnicha A.M., Lychyk G.Z., Makac YE.F., Maksymchuk T.P., Matviiyenko A.G., Meschishen I.F., Mikhyeyev A.O., Mikhyeyeva N.G., Mischenko K.M., Mylnikova O.O., Novobranova O.V., Nykytuk G.P., Osiichuk O.V., Panimarchuk O.I., Pschenychna O.A., Radko O.V., Reva T.D., Rogovyk V.Y., Savchenko L.G., Sav'yak O.L., Shatova O.P., Shkoda O.S., Shemchuk L.A., Shemonayeva K.F., Shenhof YU.O., Shevcova A.I., Shtrihol S.YU., Sidelnikova T.A., Sira L.M., Skladanyuk R.V., Slovodyanyuk T.O., Smetanyuk O.I., Sorokoumova L.K., Stegnii M.YU., Stoletov YU.V., Stolyarchuk E.V., Struchayeva H.I., Strumenska O.M., Sydorenko O.L., Taller O.YU., Tkachenko YE.V., Tomarovska T.O., Trzhechinskyi S.D., Tvorko M.S., Uhrin O.M., Vasilyeva A.G., Vasyuk S.O., Vorobec N.M., Vronska L.V., Yahupova A.C., Yakimenko O.I., Yaremii I.M., Yaschyshyn Z.M., Yuschenko T.I., Yuzyfyshyn M.V., Zadorina O.V., Zahrichuk G.YA., Zemlyakova L.F., Zhornyak O.I. and Committees of professional expertise.

Item reviewers. Anisimova V.YU., Arzumanov P.S., Bocharov O.A., Cherpak O.M., Deineka C.YE., Herush O.V., Holdobina O.V., Hontova T.M., Hrihor'yeva N.P., Ivanec L.M., Kaluhina S.M., Kaplaushenko A.H., Klepa T.I., Kobilinska L.I., Kostina T.A., Lisnicha A.M., Lyubinec L.A., Macoid O.B., Minarchenko V.M., Ohurcov V.V., Pocrishko O.V., Shanaida M.I., Shtrihol S.YU., Tomarovska T.O., Tyupka T.I., Vasuk S.O., Vronska L.V., Yuschenko T.I., Zahaiko A.L., Zahrichuk H.YA.,

The book includes test items for use at licensing integrated examination “Krok 1. Pharmacy” and further use in teaching.

The book has been developed for students of pharmaceutical faculties and academic staff of higher medical educational establishments.

Approved by Ministry of Public Health of Ukraine as examination and teaching publication based on expert conclusions (Orders of MPH of Ukraine of 14.08.1998 №251, of 27.12.1999 №303, of 16.10.2002 №374, of 29.05.2003 №233).

1. Calculation of chemical reactions thermal effects at pharmaceutical production is based on the Hess law, stating that reaction thermal effect is determined by:

- A. Initial and final state of system
- B. Mechanism by which the chemical change occurs
- C. Route by which the chemical change occurs
- D. Number of intermediate stages
- E. Process duration

2. Dobutamine has been administered to the 49-year-old-patient with acute cardiac failure and cardiac glycoside intolerance. What is this drug's mechanism of action?

- A. Stimulation of β_1 -adrenoreceptors
- B. Stimulation of α_1 -adrenoreceptors
- C. Blockade of K^{+} , Na^{+} -adenosinetriphosphatase
- D. Suppression of phosphodiesterase activity
- E. Stimulation of *M*-cholinergic receptors

3. During calculous cholecystitis attack the patient has developed the following symptoms: saponated feces and steatorrhea. What stage of fats metabolism is disrupted according to those symptoms?

- A. Fat digestion, absorption and secretion
- B. Fat absorption
- C. Intermediary metabolism of fats
- D. Fats metabolism in adipose tissue
- E. Depositing disruption

4. If aromatic secretory-downy plant has square in cross section stem, spike inflorescence made up from whorled dichasia, bilabiate corolla and its fruit consists of four nutlets, it probably belongs to the following family:

- A. *Lamiaceae*
- B. *Scrofulariaceae*
- C. *Brassicaceae*
- D. *Apiaceae*
- E. *Solanaceae*

5. When root is studied under microscope, one leading bundle is

detected in its maturation zone, where xylem and phloem areas interchange radially. It can be concluded that this bundle type is:

- A. Radial
- B. Collateral
- C. Bicollateral
- D. Amphicribal
- E. Amphivasal

6. In large intestine microorganisms synthesize vitamins that participate in organism's biochemical processes. What vitamins are mainly synthesized by microflora?

- A. *K*, *B*₁₂
- B. *A*, *C*
- C. *E*, *PP*
- D. *B*₁, *B*₂
- E. *B*₆, *E*

7. Parents of the 10-year-old child have made an appointment with endocrinologist due to complaints of child's low height. The child's appearance is corresponding with that of 5-year-old child. What hormon secretion disorder causes such physical development changes?

- A. Somatotropic hormone
- B. Adrenocorticotropic hormone
- C. Thyroxin
- D. Testosterone
- E. Insulin

8. The 55-year-old patient has been hospitalised due to chronic cardiac failure. Objectively: skin and mucosa are cyanotic, tachycardia, tachypnea. What kind of hypoxia does the patient have?

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

9. The patient has been hospitalised with pneumonia. What kind of respiratory failure does the patient have?

- A. Restrictive
- B. Obstructive
- C. Central
- D. Peripheral
- E. Thoracic diaphragm

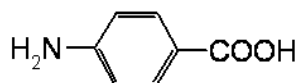
10. What naloxone indications are there?

- A. Narcotic analgetics acute poisoning
- B. Heavy metals poisoning
- C. Cardiac glycosides poisoning
- D. Ergot alkaloids poisoning
- E. Atropine sulphate poisoning

11. During gastric secretory function research decrease of hydrochloric acid concentration in gastric juice was detected. What enzyme will be less active in such a condition?

- A. Pepsin
- B. Amylase
- C. Lipase
- D. Dipeptidase
- E. Hexokinase

12. What reagent does p-aminobenzoic acid amino group react with?



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

13. The patient with hepatic colic has been prescribed spasmolytic of muscarinic receptor antagonists group as a part of his complex therapy. What drug is it?

- A. Atropine
- B. Proserin
- C. Galantamine
- D. Dithylin
- E. Benzohexonium

14. Microscopy of monocotyledon leaf epidermis revealed that stomatal complex has four accessory cells. That means stomatal apparatus belongs to the following type:

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

15. *Arctostaphylos uva ursi*, *Vaccinium vitis idae*, *Vaccinium myrtillus* life forms can be defined as:

- A. Small shrub (fruticulus)
- B. Vine
- C. Grass
- D. Shrub (frutex)
- E. Subshrub (suffrutex, semifrutex)

16. In the course of plant cells treatment with phloroglucinol with concentrated sulfuric acid their cell walls became crimson-red, which means:

- A. Lignification
- B. Suberization
- C. Mucification
- D. Cutinization
- E. Mineralization

17. When root was being studied under microscope, root hairs were detected, which are cell growths of:

- A. Epiblema
- B. Epidermis
- C. Endoderm
- D. Exoderm
- E. Mesoderm

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

- A. Decrease of arterial pressure
- B. Excitation of central nervous system
- C. Disruption of cardiac rate
- D. Increase of intraocular pressure
- E. Allergic skin rashes

19. Potassium iodide solution has been added to the solution containing cations of the sixth analytical group (acid-base classification). It resulted in red precipitate soluble in excess of reagent. What cations are present in the solution?

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

20. The Mohr method is used to define sodium chloride mass concentration in isotonic solution. Titration is carried out with the following indicator present:

- A. Potassium chromate
- B. Fluorescein
- C. Ammonium iron (III) sulfate
- D. Diphenylcarbazone
- E. Ferroin

21. The student with cold has been prescribed antipyretic medicine. Name this medicine.

- A. Paracetamol
- B. Ascorbic acid
- C. Oxytocin
- D. Famotidine
- E. Cyanocobalamin

22. Name the drug that causes miosis and lowers intraocular pressure.

- A. Pilocarpine hydrochloride
- B. Fenofibrate
- C. Nitrazepam
- D. Atropine sulphate
- E. Suxamethonium chloride

23. The patient with acute cardiac failure has developed dyspnea, tachycardia and cyanosis during physical exertion. Name the type of hypoxia.

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

24. Choose the surfactant out of the substances listed below:

- A. C_2H_5OH
- B. H_2O
- C. $NaCl$
- D. HNO_3
- E. $K_4Fe[(CN)_6]$

25. Cations Cu^{2+} , Co^{2+} , Ni^{2+} , Cd^{2+} , Hg^{2+} belong to the sixth group of cations.

What is the group reagent for the sixth group of cations?

- A. Excess of NH_3
- B. Solution of H_2SO_4
- C. Solution of $NaOH$
- D. Excess of KOH solution
- E. Solution of HCl

26. Research of reaction rate dependence from various factors allows to intensify technological processes. What factor **HAS NO** effect on reaction rate constant?

- A. Reacting agents concentration
- B. Temperature
- C. Reagents nature
- D. Solvent nature
- E. Solid substance dispersion degree

27. What substance is surface-inactive regarding water-air interface?

- A. Saccharose
- B. Acetic acid
- C. Ethanol
- D. Methylamine
- E. Acetone

28. Medicines used in treatment of dental caries contain sodium fluoride. Which one of the compounds given below does NaF react with?

- A. H_2SO_4
- B. CO_2
- C. $NaCl$
- D. KI
- E. CH_3COOH

29. Epinephrine is used to prolong the effect of novocaine during infiltration anesthesia. What epinephrine action is this effect caused by?

- A. Vasoconstriction
- B. Potentiation of novocaine action at CNS level
- C. Suppression of nerve endings and conductors functioning
- D. Vasodilatation
- E. Suppression of tissue esterases

30. Potentiometric method of pH measuring is used during pharmaceutical substances research. What electrode can be used as indicator (working electrode) in solution pH

measuring?

- A. Glass
- B. Standard hydrogen
- C. Zinc
- D. Calomel
- E. Silver-chlorine

31. What analytical effect is observed when titration end point in the Volhard method is registered?

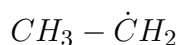
- A. Red coloration of solution
- B. Red precipitate
- C. Yellow coloration of solution
- D. Brown precipitate
- E. Yellow precipitate

32. Information transfer from peptide hormones to intracellular second messengers occurs involving adenylate cyclase. What reaction is catalyzed by adenylate cyclase?

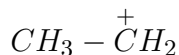
- A. Cyclic adenosine monophosphate production
- B. ATP breakdown into ADP and inorganic phosphate
- C. ATP synthesis from adenosine monophosphate and pyrophosphate
- D. ADP breakdown with adenosine monophosphate and inorganic phosphate production
- E. ATP breakdown into adenosine monophosphate and pyrophosphate

33. Point out radical among active intermediate particles given below.

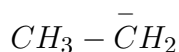
A.



B.



C.



D.



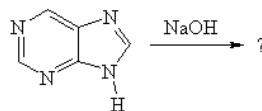
E.



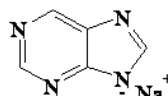
34. Point out number of π -electrons in benzol molecule.

- A. 6
- B. 2
- C. 4
- D. 5
- E. Benzol has no π -electrons

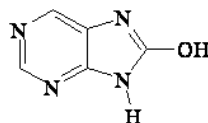
35. Point out the product resulting from interaction of purine with sodium hydroxide:



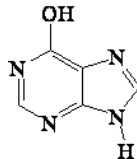
A.



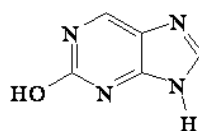
B.



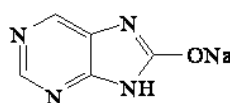
C.



D.



E.



36. At the sixth month of pregnancy the female patient has been diagnosed with severe iron-deficiency anemia. Diagnostic character was the appearance of the following in blood:

- A. Hypochromic erythrocytes
- B. Macrocytes
- C. Megalocytes
- D. Reticulocytes
- E. Erythroblasts

37. Botulism agent causes severe food toxicoinfection. Point out the most characteristic morphologic feature of botulism agent.

- A. Gram-positive spore-forming bacilli with subterminal spore
- B. Thick gram-positive non-spore-forming bacilli
- C. Gram-positive spore-forming bacilli with terminal spore
- D. Thin mobile spore-forming bacilli with central spore
- E. Thick gram-positive non-spore-forming non-filament-forming bacilli

38. What reagent is used to separate $AgCl$ precipitate from AgI precipitate?

- A. Aqueous solution of ammonia
- B. Concentrated nitric acid
- C. Diluted nitric acid
- D. Concentrated solution of potassium chloride
- E. Sulfuric acid solution

39. Nitrite ions can be detected in the presence of nitrate ions using the following:

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

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

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

41. 1 minute after the patient had been administered penicillin the patient's arterial pressure sharply dropped, pulse became thready, cold sweating and clonic convulsions began. Name this condition.

- A. Anaphylactic shock
- B. Traumatic shock
- C. Cardiogenic shock
- D. Septic shock
- E. Burn shock

42. Virological laboratory has received patient's nasopharyngeal lavage. What can be used to single out influenza virus from the patient's lavage?

- A. Chick embryo
- B. Meat infusion agar
- C. Meat infusion broth
- D. Endo's medium
- E. Lowenstein–Jensen medium

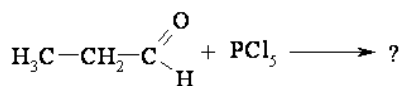
43. When hydrogen peroxide solution is administered to bleeding wounds, it is broken up by one of the blood enzymes. Point out this enzyme.

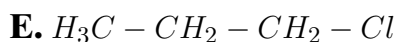
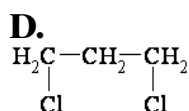
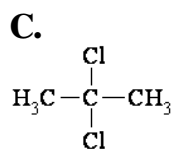
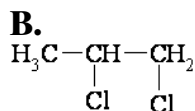
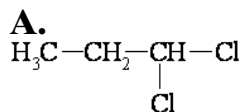
- A. Catalase
- B. Monoamine oxidase
- C. Cytochrome oxidase
- D. Aspartate aminotransferase
- E. Lactate dehydrogenase

44. Water solution of $CaCl_2$ with 10% mass concentration is used for intravenous injections. What is the maximum value of $CaCl_2$ isotonic coefficient in water solution?

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

45. What product results from propionic aldehyde and PCl_5 interaction?





46. What qualitative reaction proves linoleic acid nonsaturation?
 $\text{CH}_3(\text{CH}_2)_4\text{CH} = \text{CH} - \text{CH}_2 - \text{CH} = \text{CH}(\text{CH}_2)_7\text{COH}$

- A.** Decoloration of bromine water ($\text{Br}_2; \text{H}_2\text{O}$)
- B.** Hydrohalogenation (HCl)
- C.** Reaction with FeCl_3
- D.** "Silver mirror" reaction with $[\text{Ag}(\text{NH}_3)_2]\text{OH}$
- E.** Decarboxylation

47. Staphylococci grow well in ordinary media but inoculation of blood and egg-yolk salt agar should be done to separate pure bacterial cultures from diseased tissue. What is the purpose of those media?

- A.** To define disease-producing factor
- B.** To define tinctorial properties
- C.** To study antigenic properties
- D.** To define bacterial mobility
- E.** To define antibiotic susceptibility

48. How to separate PbSO_4 from mixture of the 3rd analytical group cation sulphates in the process of systematic analysis?

- A.** Processing precipitate with 30% ammonium acetate solution
- B.** Precipitate recrystallization
- C.** Processing precipitate with concentrated sulfate acid
- D.** Processing precipitate with acetate acid solution
- E.** Processing precipitate with ammonia solution

49. In the process of conductometric titration of HCl and CH_3COOH acids mixture 0,1 M solution of NaOH is used to measure:

- A.** Electrical conduction in solution
- B.** pH of medium
- C.** Potential difference
- D.** Rotation angle of polarized light plane
- E.** Refractive index

50. Gas chromatography has been used for ethanol quantitative determination. What parameter is measured?

- A.** Chromatographic peak height or area
- B.** Retention time
- C.** Retention volume
- D.** Chromatographic peak width
- E.** Chromatographic peak half-width

51. Pharmaceutical synthesis requires studying complex reaction kinetics. If the first stage product is the second stage initial substance, then such reaction is called:

- A.** Consecutive
- B.** Inverse
- C.** Concerted
- D.** Second order
- E.** Parallel

52. The following spore-forming bacteria can be preserved in soil over a long period of time: clostridia of tetanus, botulism, anaerobic gas infection. Name the way with which these microorganisms get into soil.

- A.** With feces
- B.** With urine
- C.** With water
- D.** With industrial waters
- E.** With expectoration

53. Meat infusion broth is prepared

for sterilization in bacteriological laboratory. What sterilization method is advisable?

- A. Autoclaving
- B. Ignition
- C. Boiling
- D. Filtering
- E. Dry heat

54. Point out benzene structure:

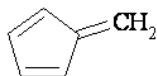
A.



B.



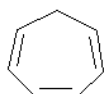
C.



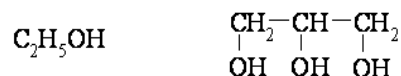
D.



E.



55. What reagent action allows to distinguish ethanol from glycerine?



- A. $\text{Cu}(\text{OH})_2$
- B. HBr
- C. FeCl_3
- D. KMnO_4
- E. Ag_2O

56. The patient with acute left ventricular failure has developed edema of lungs. What peripheral circulation disorder taking place in the lungs has caused this complication?

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

57. Knee joint enlargement and cutaneous edema has developed in the 46-year-old patient with acute knee joint inflammation on the second day. What stage of inflammation progressing are these symptoms usually observed at?

- A. Exudation
- B. Alteration
- C. Proliferation
- D. Regeneration
- E. Sclerosis

58. What data is necessary to calculate activation energy of drug synthesis reaction?

- A. Reaction rate constant for two temperatures
- B. Thermal effect
- C. Change of Gibbs energy of system
- D. Internal energy of system
- E. Reaction order

59. In the process of chemical solution preparation laboratory assistant's forearm was exposed to concentrated hydrochloric acid. There are burning pain, hyperemia and swelling of the damaged area. What pathologic process are these symptoms evidential of?

- A. Inflammation
- B. Tumor
- C. Embolism
- D. Thrombosis
- E. Lymphostasis

60. Capsuliferous bacteria has been detected during microbiological inspection of crude drugs. What method of staining has been used to detect capsules?

- A. Burri-Gins
- B. Ziehl-Neelsen
- C. Neisser
- D. Gram
- E. Aujeszky

61. Antibiotics produced by fungi

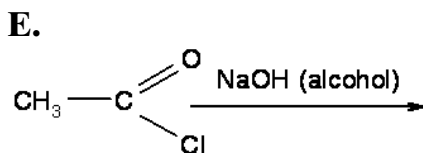
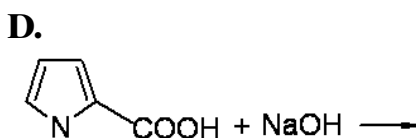
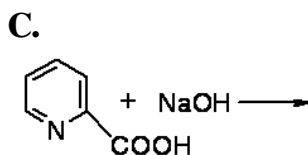
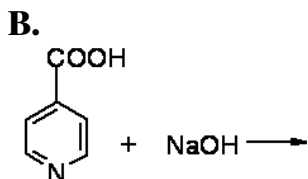
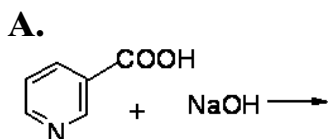
belonging to *Penicillium* and *Aspergillus* genera are widely used in medicine. What class do these genera belong to?

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

62. The following parameter is used in thin-layer chromatography to identify pharmaceutical composition:

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

63. What reaction will produce sodium nicotinate as a result?



64. Why is ethyl alcohol used along with the group reagent of the third analytical group?

- A. To ensure full precipitation of all cations of this group
- B. To further dissolve obtained precipitate
- C. For fractional precipitation of cations
- D. To change pH of medium
- E. To prevent complexing

65. In 1915 Japanese scientists Katsusaburo Yamagiwa and Koichi Ichikawa became the first, who induced experimental tumors, by painting ears of rabbits with coal tar. What method of experimental tumor inducing did they use?

- A. Chemical induction
- B. Transplantation
- C. Explantation
- D. Cell-free filtrate induction
- E. Radioisotope induction

66. The alleged diagnosis of the newly-hospitalised in-patient is leukemia. What symptom among those given below is diagnostic character differentiating acute leukemia from chronic leukemia?

- A. Leukemic hiatus
- B. Significant increase of leucocytes number
- C. Leukosis rate
- D. Eosinophil and basophil levels
- E. Gumprecht's shadows (smudge cells)

67. A student analyses plant organ with radial symmetry, unlimited growth and positive geotropism, which provides nourishment, vegetative reproduction and plant fastening in soil. This organ is:

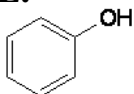
- A. Root
- B. Stem
- C. Leaf
- D. Rhizome
- E. Seed

68. In root transverse section laying and formation from pericycle of the following organs can be seen in maturation zone:

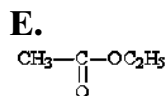
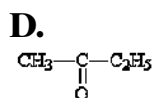
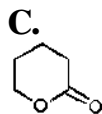
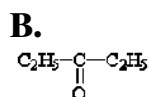
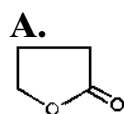
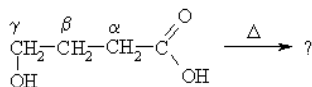
- A. Lateral roots
- B. Trichome
- C. Additional roots
- D. Root hairs
- E. Root cap

69. What chemical compound **WILL NOT** decolorize bromine water?

- A. $CH_3 - CH_3$
- B. $CH_2 = CH_2$
- C. $CH \equiv CH$
- D. $CH_3 - CH = CH_2$
- E.



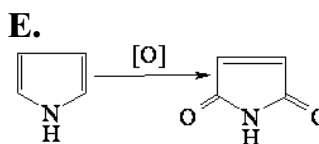
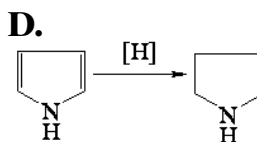
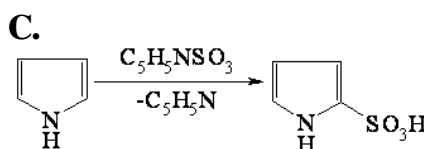
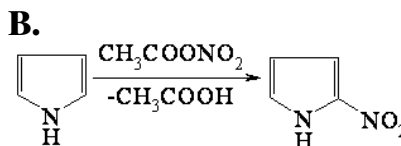
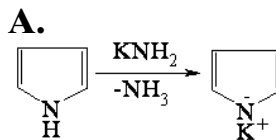
70. γ -Butyrolactone is produced during γ -hydroxybutyric acid heating. Point it out among the compounds given below:



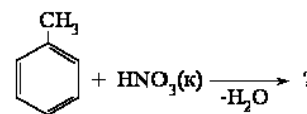
71. What compound has no carboxyl group but nevertheless is called an acid?

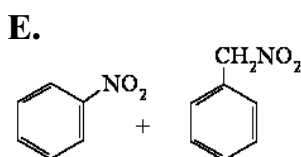
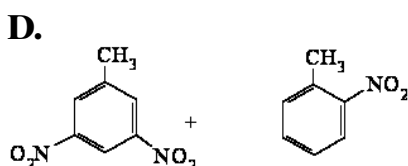
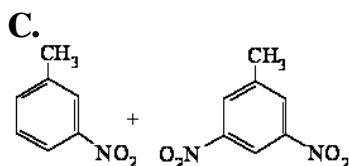
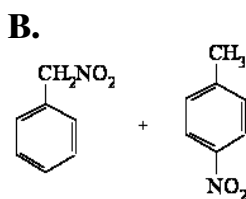
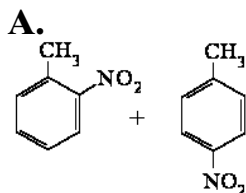
- A. Picric acid
- B. Valeric acid
- C. Tartaric acid
- D. Lactic acid
- E. Malic acid

72. What reaction proves acid properties of pyrrole?



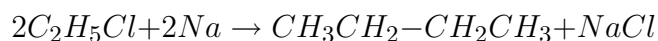
73. Products obtained from toluene nitriding will mostly consist of:



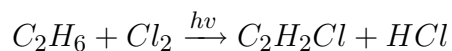


74. Which of the reactions given below is called the Wurtz reaction?

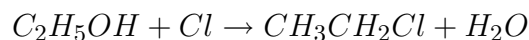
A.



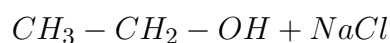
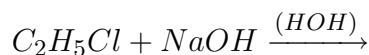
B.



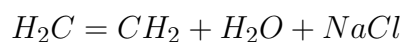
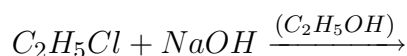
C.



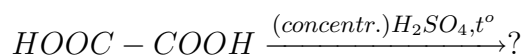
D.



E.



75. What products result from the process of heating oxalic acid ($HOOC-COOH$) with concentrated sulfate acid (H_2SO_4)?



A. $CO_2 + CO + H_2O$

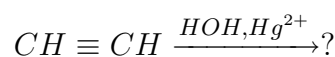
B. $2CO_2 + H_2$

C. $H_2O + CO_2$

D. $2CO + H_2 + O_2$

E. $C_2H_2 + 2O_2$

76. Point out the substance produced during the following reaction:



A. Ethanal

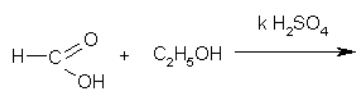
B. Ethanol

C. Propionaldehyde

D. Propanone

E. Acetate acid

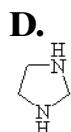
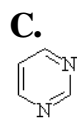
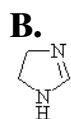
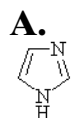
77. When substances interact according to the scheme given in



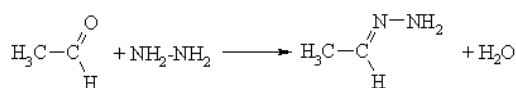
it results in the following:

- A. Ethyl formate
- B. Ethyl acetate
- C. Methyl ethanoate
- D. Methyl acetate
- E. Methyl formate

78. Point out the compound that has amphoteric properties, that is, reacts both with acids and bases producing relevant salts.

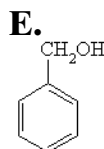
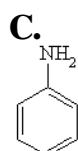
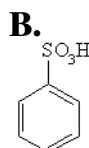
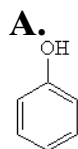
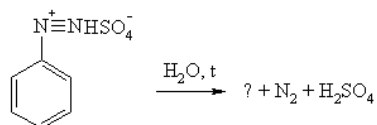


79. Point out the correct name of product resulting from interaction of acetaldehyde with hydrazine:



- A. Acetaldehyde hydrazone
- B. Acetaldoxime
- C. Acetaldimine
- D. Acetaldehyde phenylhydrazine
- E. Acetaldehyde semicarbazone

80. Point out the product of the reaction given below:



81. Point out the compound that allows to synthesize acetonitrile $\text{CH}_3-\text{C} \equiv \text{N}$ in one stage.

- A. CH_3-I
- B. CH_4
- C. CH_3-OH
- D. $\text{C}_2\text{H}_5-\text{Cl}$
- E. $\text{C}_6\text{H}_5\text{Cl}$

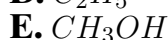
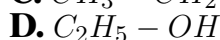
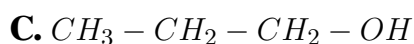
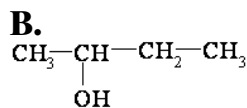
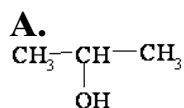
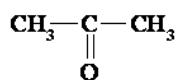
82. What reagent is used to perform the following transformation:



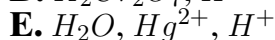
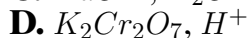
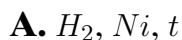
- A. $\text{NaNO}_2(\text{HCl})$
- B. $\text{K}_2\text{Cr}_2\text{O}_7$
- C. $\text{NaNO}_3(\text{H}_2\text{SO}_4)$
- D. KOH
- E. $\text{Cu}(\text{OH})_2$

83. Which of the alcohols given in

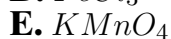
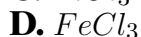
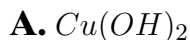
produces acetone during oxidation?



84. What reagent will allow for unsaturated organic compounds reduction under the conditions given below?



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



86. In spring birch and poplar buds are gathered. They essentially are:

A. Embryonic shoots

B. Sporophyte embryos

C. Gametophyte embryos

D. Reduced sporophytes

E. Reduced gametophytes

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

A. Pinnatilobate

B. Trilobate

C. Pinnatipartite

D. Palmatilobate

E. Palmatipartite

88. Catabolism of body's own tissue proteins is intensified during such diseases as thyrotoxicosis and tuberculosis. This process is attended by intensive synthesis in liver and subsequent excretion with urine of the following:

A. Urea

B. Glucose

C. Acetone bodies

D. Fatty acids

E. Nucleotides

89. Natural peptides can carry out various functions. What biologically active peptide is one of the main antioxidants and carries out coenzyme functions?

A. Glutathione

B. Bradykinin

C. Oxytocin

D. Releasing hormone (Liberine)

E. Anserine

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

A. 1000 bacteria and 100 mold fungi

B. 100 bacteria and 10 mold fungi

C. 10 bacteria and no mold fungi

D. No bacteria and no mold fungi

E. 1000 bacteria and 200 mold fungi

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

- A. Staphylococcus aureus
- B. Enterobacteriaceae
- C. Staphylococcus epidermidis
- D. Staphylococcus saprophyticus
- E. Pseudomonas aeruginosa

92. Leaves damage by mosaic discoloration has been detected at medicinal plantations. What microorganisms are the cause?

- A. Plant-pathogenic viruses
- B. Plant-pathogenic bacteria
- C. Plant-pathogenic fungi
- D. Protozoa
- E. Rickettsia

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

- A. Beta-lactamases production
- B. Cell wall permeability
- C. Active synthesis of peptidoglycane
- D. Active transport of antibiotics
- E. Protein synthesis

94. The following have been detected in hand lavage of the kindergarten chef: colibacilli, ray fungi, staphylococci, bacilli, mold fungi. What microbes are evidential of fecal contamination of hands?

- A. Colibacilli
- B. Ray fungi
- C. Staphylococci
- D. Bacilli
- E. Mold fungi

95. A person has been in contact with influenza patient. What drug should be administered for specific passive influenza prophylaxis?

- A. Antigrippal immunoglobulin
- B. Vaccine influenza virus inactivated
- C. Leukocytic interferon
- D. Amizon
- E. Anaferon

96. Which one of the listed substances causes formation of acquired artificial passive immunity?

- A. Tetanus serum
- B. BCG vaccine
- C. Tetanus anatoxin
- D. DPT vaccine
- E. -

97. Reaction rate constant numerically equals reaction rate, if molar concentrations of:

- A. Reagents equal 1
- B. Reagents differ by 1
- C. Products are identical
- D. Products differ by 1
- E. -

98. Tetanic spasms of skeletal muscles occur under low calcium concentration in blood. What endocrine disorder can this condition be associated with?

- A. Hypofunction of parathyroid glands
- B. Hyperfunction of adrenal cortex
- C. Hypofunction of adrenal cortex
- D. Hyperthyroidism
- E. Hypothyroidism

99. Eicosanoids, - hormone-like compounds, - are used to stimulate labor and for contraception. What substances have such an effect?

- A. Prostaglandines
- B. Interleukines
- C. Endorphines
- D. Angiotensines
- E. Enkephalines

100. When studying *white mistletoe*, - perennial medicinal semiparasite plant, - it was revealed that its embryonic root buries into higher plant stem tissue and reaches vascular tissue system. This type of roots is called:

- A. Haustorial roots
- B. Photosynthetic roots
- C. Aerating roots
- D. Contractile roots
- E. Aerial roots

101. It is known that cells of *Chlorophyta* division representatives have chromatophores of various shapes. We can observe ribbon-like chromatophores in the species of the following genus:

- A. *Spyrogyra*
- B. *Volvox*
- C. *Clorella*
- D. *Chlamidomonas*
- E. *Spirulina*

102. During practical field session students have detected plant with diversity of leaves that differ by their placement on stem, parts development, size, shape, lamina division. This phenomenon is called:

- A. Heterophyly
- B. Phyllotaxy
- C. Metamorphosis
- D. Leaf mosaic
- E. Venation

103. It is known that leaves of most gymnosperm species are represented by needles. Which one of the species listed below has macropodous leathery leaves with solid flabellate lamina, dichotomous venation and one or several notches along the upper margin?

- A. *Ginkgo biloba*
- B. *Cedrus libani*
- C. *Juniperus communis*
- D. *Picea abies*
- E. *Abies sibirica*

104. Leaves of *Aesculus hippocastanum* are composed of 5-7 assidenous folioles that are oblong-obovate shaped with dentate-serrated margin, are attached to petiole (leaf rachis), and therefore are:

- A. Palmately compound
- B. Pinnately compound
- C. Pinnatisected
- D. Palmatisected
- E. Palmatilobed

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

- A. Glass
- B. Silver-chlorine
- C. Silver
- D. Platinum
- E. Calomel

106. In pharmaceutical production oxyethylated derivatives of fatty acid esters (FAEs) are used, which undergo colloid dissolution in sufficiently concentrated solutions. This process is called:

- A. Solubilization
- B. Sensitization
- C. Synergism
- D. Colloid protection
- E. Syneresis

107. A newborn infant has hemolytic jaundice caused by rhesus incompatibility. What bile pigment will be concentrated highest in the blood of this infant?

- A. Unconjugated bilirubin
- B. Conjugated bilirubin
- C. Urobilinogen
- D. Stercobilinogen
- E. Bile acids

108. The patient with acute cardiac insufficiency has decreased urine excretion caused by reduction of filtering taking place in glomerules. What causes this drop in filtration?

- A. Decrease of arterial pressure
- B. Increase of hepatic blood flow
- C. Exsiccosis
- D. Duct lumen obstruction
- E. Decrease in number of functioning glomerules

109. The 49-year-old female patient suffering long-term from pancreatic diabetes has developed the following symptoms after administering insulin: weakness, facial pallor, palpitation, anxiety, double vision, numbness of lips and tongue apex. Glucose molar concentration in blood was 2,5 mmol/l. What complication has developed in the patient?

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

110. The 40-year-old patient has been diagnosed with gastric ulcer, disease symptoms making reappearance after

prolonged period of dormancy. How can this kind of disease progression be qualified?

- A. Relapse
- B. Remission
- C. Recovery
- D. Latent period
- E. Prodromal stage

111. The 55-year-old female patient has developed a case of acute pancreatitis caused by greasy food. What is the main pathogenesis step of this disorder?

- A. Premature activation of enzymes in gland ducts and cells
- B. Pancreatic juice deficiency
- C. Low bile production in liver
- D. Fats digestion disruption
- E. Acute bowel obstruction

112. As the result of taking herbal medicine the 30-year-old patient has developed anaphylactic allergic reaction and blood leukocytosis. What kind of leukocytosis is characteristic of this case?

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

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

- A. Creeping
- B. Recumbent
- C. Twining
- D. Scandent
- E. Tenent

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

- A. Tyrosine
- B. Asparagine
- C. Glutamate
- D. Tryptophan
- E. Arginine

115. Milk intake has resulted in the one-year-old child having diarrhea and abdominal distension. What enzyme deficiency does the child have?

- A. Lactase
- B. Maltase
- C. Aldolase
- D. Hexokinase
- E. Glycosidase

116. The 56-year-old patient has developed megaloblastic anemia in the course of alcoholic cirrhosis. What vitamin deficiency is the main cause of anemia in this patient?

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

117. During morphological analysis of lily-of-the-valley (*Convallaria majalis*) leaf it was noted that lamina has wide elliptic shape and numerous veins are parallel to leaf margin and merge only at the leaf point. What is this venation type called?

- A. Arcuate
- B. Parallel
- C. Palmate
- D. Pinnate-reticulate
- E. Dichotomous

118. In the process of silver cations identification reaction HCl and then ammonia solution have been added to the solution. What compound has been produced as a result?

- A. $[Ag(NH_3)_2]Cl$
- B. $[Ag_2(NH_3)_3]Cl$
- C. $AgOH$
- D. $AgCl$
- E. $[Ag(NH_3)_3]Cl$

119. In chemico-analytical laboratory a specialist studies the mixture of the 5th analytical group cations. When thiocyanate ions are added the solution becomes red-colored. This analytical effect indicates presence of the following cation:

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

120. Dispensing chemist conducts quantitative determination of pharmaceutical substance with restorative properties through direct bromate titration. What solution is the titrant?

- A. Potassium bromate
- B. Iodine solution in potassium iodide
- C. Sodium thiosulfate
- D. Potassium iodide
- E. Chloride acid

121. In the chemico-analytical laboratory the dispensing chemist studies solution of anion mixture. When antipyrin solution is added it becomes emerald-green colored. This analytical effect signifies presence of the following anions:

- A. Nitrite
- B. Nitrate
- C. Acetate
- D. Tartrate
- E. Citrate

122. In microbiology class students had been growing pure bacterial culture. Bacterial inoculation of solid medium was performed to obtain separate visible colonies, resulting in two colonies, R-type and S-type, grown in thermostat after one day of incubation. What microorganism properties were described by students?

- A. Cultural
- B. Tinctorial
- C. Biochemical
- D. Morphologic
- E. Antigenic

123. Androecium of *Brassica oleracea* flower has six stamens, with four stamens of inner circle longer than two stamens of outer circle. What is this type of androecium called?

- A. Tetradynamous
- B. Didynamous
- C. Diadelphous
- D. Monadelphous
- E. Polyadelphous

124. The dispensing chemist has been studying properties of certain disperse system classes, namely, aerosols. What optical phenomenon is characteristic of this disperse system class?

- A. Light scattering
- B. Light absorption
- C. Opalescence
- D. Light reflection
- E. Light refraction

125. Selective solvents are used in laboratories and factories to isolate and refine essential oils, alkaloids, antibiotics and other pharmaceutical substances. This process is called:

- A. Extraction
- B. Sedimentation
- C. Coagulation
- D. Flocculation
- E. Flotation

126. When rare dosage forms are produced, colloid surfactants are added to increase certain components solubility. What physicochemical phenomenon is this process based on?

- A. Solubilization
- B. Coagulation
- C. Extraction
- D. Diffusion
- E. Sedimentation

127. A pharmacist has been adding small portions of electrolyte to silver chloride sol, with resulting coagulation occurring under higher electrolyte concentration, if compared to single instance of adding electrolyte. This phenomenon is called:

- A. Sol acclimatization
- B. Antagonism
- C. Synergism
- D. Additivity
- E. Desensitization

128. Ketoacidosis occurs during starvation. What metabolite blood concentration increase is symptomatic

of this medical condition?

- A. Acetoacetate
- B. Oxaloacetate
- C. Malonate
- D. Beta-hydroxy-beta-methylglutaryl-CoA
- E. Acetyl-CoA

129. The patient with myocardial infarction has been prescribed statines, cholesterol synthesis inhibitors, to prevent complications. What enzyme activity is suppressed by these medicines?

- A. Beta-GHB-reductase
- B. Hydroxylase
- C. Lecithin-cholesterol acyltransferase
- D. Esterase
- E. Oxygenase

130. What compound is added along with murexide indicator when detecting calcium cations in order to reach pH>12?

- A. Sodium hydroxide
- B. Acetate buffer
- C. Urotropin
- D. Ammoniac buffer
- E. Ammonium hydroxide

131. To make diaphoretic herbal tea the following inflorescences are used: 3-15 corymbose dichasia with light-yellow oblong wing-shaped membranous recaulescent squamella that fuses halfway with floral axis. Flowers are fragrant, yellowish. These inflorescences belong to:

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

132. S.H.Navashyn, Ukrainian scientist, was the first one, who described double fertilization. In the process of fertilization first spermium conjugates with central nucleus of embryo sac and second spermium with:

- A. Ovicell
- B. Synergides
- C. Antipodes
- D. Nucellus
- E. Chalaza

133. The dispensing chemist's arterial pressure has increased (160/110 mm Hg) due to his conducting long-term analytical analysis (neurosis). What neurohumoral regulation changes can cause increased arterial pressure in the given case?

- A. Sympathoadrenal system activation
- B. Activation of aldosterone producing and secretion
- C. Renin-angiotensin system activation
- D. Kallikrein-kinin system activation
- E. Sympathoadrenal system inhibition

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

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

135. Pharmacy has received viricides. Choose the viricide used for influenza treatment from the list given below.

- A. Rimantadine
- B. Metisazone
- C. Levamisole
- D. Azidothimidine
- E. Acyclovir

136. Infectious agents of various ultrastructures can be etiological agents of infectious diseases. Which of the groups named below **HAS NO** cellular structure, protein synthesizing, enzyme and energy systems?

- A. Viruses
- B. Fungi
- C. Bacteria
- D. Protozoa
- E. Rickettsia

137. Emulsions are widely used in pharmaceutical practice. What is the process of spontaneous merging of drops in emulsions called?

- A. Coalescence
- B. Flocculation
- C. Sedimentation
- D. Flotation
- E. Coagulation

138. Streptomycin and other aminoglycosides by binding with 30S-subunit of ribosome prevents formylmethionyl-tRNA joining. What process is disrupted due to this effect?

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

139. Production of injections in pharmacies requires strict control of sterilization quality. What is placed in autoclave sterilization chamber to ensure proper control?

- A. Ampoule with microbe spores
- B. Ampoule with staphylococcus culture
- C. Ampoule with colibacillus culture
- D. Ampoule with fungi spores
- E. Ampoule with viruses

140. The patient has hypovitaminosis PP. What amino acid taken with meals partially compensates patient's need for vitamin PP?

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

141. The 13-year-old female patient having suffered from measles complains of dry mouth, thirst, body weight loss, polyuria, her glucose concentration in blood is 16 mmol/l. What disease can be suspected?

- A. Type I pancreatic diabetes
- B. Type II pancreatic diabetes
- C. Diabetes insipidus
- D. Steroidogenic diabetes
- E. Glycogenosis

142. The patient with mushroom poisoning has developed the following symptoms: yellow coloring of skin and sclera, dark-colored urine. Hemolytic jaundice was diagnosed. What pigment causes such coloring of the patient's urine?

- A. Stercobilin
- B. Conjugated bilirubin
- C. Biliverdin
- D. Unconjugated bilirubin
- E. Verdohemoglobin

143. Phenomenon of decreasing system volume resulting from polymer swelling is called:

- A. Contraction
- B. Solvation
- C. Sedimentation
- D. Dissolution
- E. Coagulation

144. If the amount of high-molecular substance added to the given sol is extremely small, it is possible its stability will decrease, instead of increase. What is this phenomenon called?

- A. Sensitization
- B. Solubilization
- C. Syneresis
- D. Sedimentation
- E. Synergism

145. Ammonia solution has been added to the solution being studied. Black precipitate has formed. That means the following cations are present in the solution:

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

146. Silver nitrate solution has been added to the solution containing anions of the first analytical group. It

resulted in yellow precipitate. That means the following are present in the solution:

- A. Arsenite ions
- B. Arsenate ions
- C. Sulphate ions
- D. Iodide ions
- E. Bromide ions

147. The child has been hospitalised with scalded skin syndrome. *Staphylococcus aureus* was detected in blisters. What virulence factor causes exfoliation and necrosis of epidermis?

- A. Exfoliative toxin
- B. Enterotoxin
- C. Hemolysin
- D. Toxic shock syndrome toxin
- E. Hyaluronidase

148. During long-term carbon tetrachloride poisoning of animals significant activity drop of aminoacyl tRNA synthetase in hepatocytes was detected. What metabolic process is disrupted in this case?

- A. Protein biosynthesis
- B. DNA replication
- C. RNA transcription
- D. Post-translational modification of peptides
- E. Post-transcriptional modification of RNA

149. Nucleoproteins contain significant amount of alkaline proteins. What proteins carry out structural function in chromatin?

- A. Protamines and histones
- B. Albumines and globulines
- C. Prolamines and glutenins
- D. Hemoglobin and myoglobin
- E. Interferones and mucin

150. Cherry (*Prunus cerasus*) inflorescence has short floral axis and approximately same length pedicels emerging from one point. It is characteristic of the following inflorescence organisation:

- A. Umbel
- B. Corymb
- C. Raceme
- D. Spike
- E. Head

151. Representatives of this division propagate vegetatively by special formations: isidia, soredia, lobules. Name this division.

- A. *Lichenes*
- B. *Basidiomycota*
- C. *Equisetophyta*
- D. *Lycopodiophyta*
- E. *Polypodiophyta*

152. The Volhard method is used to define sodium chloride mass concentration. Name titrant of this method.

- A. Ammonium thiocyanate
- B. Mercury (I) nitrate
- C. Sodium tetraborate
- D. Mercury (II) nitrate
- E. Sodium hydroxide

153. Mass fraction of pharmaceutical preparations that contain aromatic amino groups is defined through nitrite titration. What external indicator is used in this case?

- A. Starch-iodide paper
- B. Methylene red
- C. Eriochrome Black T
- D. Phenolphthalein
- E. Eosin

154. The poultry factory worker, who has been consuming 5 or more raw eggs daily, complains of weakness, drowsiness, muscle pain, loss of hair, seborrhea. What vitamin deficiency causes such condition?

- A. H (biotin)
- B. C (ascorbic acid)
- C. A (retinol)
- D. B₁ (thiamine)
- E. B₂ (riboflavin)

155. The patient has icteritous skin; unconjugated bilirubin content in blood is high; conjugated bilirubin in urine is not detected. There is significant amount of urobilin in uri-

ne and stercobilin in feces. Name the pathology characterized by given symptoms.

- A. Hemolytic jaundice
- B. Obstructive jaundice
- C. Jaundice of the newborn
- D. Hepatocellular jaundice
- E. Atherosclerosis

156. Having been studied, conifer wood is determined to be composed of cells with pointed ends and lignified ring-porous cell wall. Therefore, this tissue of conifers is represented only by:

- A. Tracheids
- B. Vessels
- C. Sieve tubes
- D. Companion cells
- E. Bast fibers

157. There is a suspicion of active tuberculosis development in patient. The doctor has appointed Mantoux test to make a diagnosis. What immunobiological agent has to be administered?

- A. Tuberculine
- B. BCG vaccine
- C. DPT vaccine
- D. Tularin test
- E. DT vaccine

158. At the sixth day since illness onset the patient has been diagnosed with leptospirosis. What sample should be taken for microbiological study of disease?

- A. Blood and cerebrospinal fluid
- B. Nasopharyngeal lavage
- C. Ulcer secretion
- D. Lymph node puncture sample
- E. Urine and feces

159. Chemist-analyst should use the following reaction to detect chromium (III) ions during preliminary tests:

- A. Reaction of peroxochromate acid formation after previous chromium oxidation
- B. Apply sodium hydroxide
- C. Apply potassium permanganate
- D. Apply ammonia
- E. Apply sodium hydroxide and hydrogen peroxide

160. When determining drug expiration date, it is supposed that drug decomposition reaction is reaction of the following order:

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

161. Identical analytical effect is observed when NO_3^- and NO_2^- ions interact with:

- A. Diphenylamine and concentrated H_2SO_4
- B. Solution of $KMnO_4$
- C. Solution of I_2 y KI
- D. Solution of $AgNO_3$
- E. Solution of $BaCl_2$

162. What anion of the 2nd analytic group produces black precipitate with group reagent $AgNO_3$?

- A. S^{2-}
- B. I^-
- C. Cl^-
- D. Br^-
- E. NCS^-

163. When studying five herbarium specimen of medicinal plants, it was determined that one of them belongs to *Fabaceae* family. Which one is it?

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

164. You are studying the silvery downy plant of *Asteraceae* family, which is rich with essential oils and bitters. Harvested are apical sprouts with panicle of small round flower heads. This plant is:

- A. *Artemisia absinthium*
- B. *Arctium lappa*
- C. *Bidens tripartita*
- D. *Calendula officinalis*
- E. *Chamomilla recutita*

165. Oligomycin antibiotic is prescribed to the patient with tuberculosis. What mitochondrial process is slowed down by this medicine?

- A. Oxidative phosphorylation
- B. Substrate-linked phosphorylation
- C. Microsomal oxidation
- D. Lipid peroxidation
- E. Oxidative decarboxylation

166. Group reagent of the second analytical group anions (Cl^- , Br^- , I^- , S^{2-}) is the solution of $AgNO_3$ with the addition of the following substance:

- A. Nitric acid
- B. Hydrobromic acid
- C. Acetic acid
- D. Hydrochloric acid
- E. Hydrosulphuric acid

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

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

168. The patient has been admitted to the hospital with complaints of general fatigue, headache, lumbago, edema of face and extremities. Urine analysis revealed proteinuria, hematuria and cylindruria. What is the main pathogenetic mechanism of edema formation during glomerulonephritis?

- A. Decrease of oncotic blood pressure
- B. Increase of vascular permeability
- C. Increase of hydrodynamic blood pressure
- D. Hormonal disbalance
- E. Lymph flow disruption

169. Cataract (lenticular opacity) has developed in the 52-year-old female

patient with pancreatic diabetes. What process intensification has caused lenticular opacity?

- A. Protein glycosylation
- B. Lipolysis
- C. Ketogenesis
- D. Protein proteolysis
- E. Gluconeogenesis

170. Stinging nettle (*Urtica dioica*), hop (*Humulus lupulus*) and common elder (*Sambucus nigra*) are plants that require high nitrogen content in soil, which means that they are:

- A. Nitrophilous
- B. Nitrophobous
- C. Calciphilous
- D. Calciphobous
- E. Halophytic

171. Fluorography examination of the 59-year-old patient has revealed well-defined shadow, which is characteristic to tumor, in the lower part of the left lung. What trait is characteristic of benign tumor?

- A. Expansive growth
- B. Metastasis
- C. Cancer cachexia
- D. Invasion in surrounding tissues
- E. Infiltrating growth

172. The patient has been prescribed drug with antibacterial effect on tuberculosis mycobacteria. What drug is used in tuberculosis treatment and is pyridoxine antivitamin?

- A. Isoniazid
- B. Heparin
- C. Trimethoprim/sulfamethoxazole (Co-trimoxazole)
- D. Streptomycin
- E. Sulfanilamide

173. Detoxication rate is 4 times lower in children than in adults. What enzyme necessary for toxic compounds conjugation has low activity in children?

- A. Glucuronosyltransferase
- B. ALAT
- C. AspAT
- D. Creatine phosphokinase
- E. LDH₁

174. Certain drugs can stimulate liver to synthesize enzyme systems taking part in drugs and toxins metabolism. What compound stimulates drug metabolism in liver microsomes?

- A. Phenobarbital
- B. Heparin
- C. Menadione sodium bisulfite
- D. Sulfanilamide
- E. Aspirin

175. Barbiturates are used as soporifics. These substances, similarly to rotenone, are tissue respiration inhibitors. What complex level do these compounds suppress respiratory chain at?

- A. NADH-coenzyme Q reductase
- B. Cytochrome oxidase
- C. Cytochrome C reductase
- D. Adenosine triphosphate synthetase
- E. Succinate dehydrogenase

176. Inhibitors of one of the amides metabolism enzymes are used to treat depression. What enzyme inhibition has such an effect?

- A. Flavin adenine dinucleotide (FAD)-containing monoamine oxidase (MAO)
- B. Acetylcholinesterase
- C. Formylkynureninase (Arylformamidase)
- D. Kynurenine 3-hydroxylase
- E. Lactate dehydrogenase

177. Pathogenic microorganisms produce various enzymes in order to penetrate body tissues and spread there. Point out these enzymes among those named below.

- A. Hyaluronidase, lecithinase
- B. Lyase, ligase
- C. Transferase, nuclease
- D. Oxydase, catalase
- E. Esterase, protease

178. Method consisting in removal of low-molecular impurities from

colloidal systems and high-molecular compound solutions by semi-permeable membrane diffusion is called:

- A. Dialysis
- B. Electrodialysis
- C. Ultrafiltration
- D. Decantation
- E. Compensatory dialysis

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

- A. NO_3^-
- B. $AgCl$
- C. Ag^+
- D. $AgCl$ and Ag^+
- E. Ag^+ and NO_3^-

180. The 32-year-old patient has been taking antituberculosis drugs. Later he noticed that his urine had become red-orange in color. What drug is conductive to this phenomenon?

- A. Rifampicin
- B. Isoniazid
- C. Pyrazinamide
- D. Ethambutol
- E. Streptomycin sulphate

181. The 33-year-old female patient, who undergoes long-term treatment due to her chronic polyarthritis, complains of increased arterial pressure, adipose tissue redistribution and menstrual irregularities. What drug does the patient take?

- A. Prednisolone
- B. Indometacin
- C. Phenylbutazone
- D. Fluocinolone acetonide
- E. Diclofenac sodium

182. Due to prolonged taking of phenobarbital the epileptic patient has developed tolerance for this drug. What is this phenomenon based on?

- A. Biotransformation acceleration
- B. Absorption process weakening
- C. Increase of receptor sensitivity
- D. Biotransformation suppression
- E. Substance accumulation in body

183. What side effect is characteristic of captopril?

- A. Dry cough
- B. Increase of arterial pressure
- C. Hyperglycemia
- D. Cardiac rate disorder
- E. Hypokaliemia

184. The patient with acute poisoning needs forced diuresis. What drug can be used for this purpose?

- A. Furosemide
- B. Caffeine and sodium benzoate
- C. Galantamine hydrobromide
- D. Enalapril
- E. Piracetam

185. The patient with parkinsonism has been prescribed a drug - dopamine precursor - to relieve muscular rigidity. Name this drug.

- A. Levodopa
- B. Aminazine
- C. Paracetamol
- D. Scopolamine hydrobromide
- E. Atropine sulphate

186. The patient with neurosis has been prescribed anxiolytic derivative of benzodiazepine. Name this drug.

- A. Diazepam
- B. Atropine sulphate
- C. Piroxicam
- D. Nandrolone
- E. Trihexyphenidyl

187. The elderly patient suffers from constipation caused by large intestine hypotonia. What drug should be prescribed?

- A. Bisacodyl
- B. Sodium sulfate
- C. Castor oil
- D. Atropine sulphate
- E. Procainamide

188. In the course of bronchitis pharmacotherapy, the patient has developed dyspeptic disorders, photodermatitis and hepatic failure. What drug can cause such disorders?

- A. Doxycycline
- B. Paracetamol
- C. Ascorbic acid
- D. Acetylcysteine
- E. Codeine phosphate

189. What drug is more advisable for the patient with amebic dysentery?

- A. Metronidazole
- B. Pyrantel
- C. Levamisole
- D. Bicillin-5
- E. Benzylpenicillin sodium salt (Penicillin G sodium salt)

190. The student asks the pharmacist to recommend him the drug to relieve allergic rhinitis symptoms he suffers from when lime tree is in bloom. What drug can be recommended in this case?

- A. Loratadine
- B. Epinephrine
- C. Propranolol
- D. Ambroxol
- E. Losartan

191. The patient with rheumatoid arthritis and concomitant duodenal ulcer has to be prescribed nonsteroid antiinflammatory drug. Which one of the drugs listed below is a drug of choice in the given case?

- A. Celecoxib
- B. Acetylsalicylic acid
- C. Paracetamol
- D. Metamizole
- E. Diclofenac sodium

192. Which of the drugs listed below quickly arrests angina pectoris attack when taken sublingually?

- A. Nitroglycerine
- B. Digoxin
- C. Amiodarone
- D. Lisinopril
- E. Convallariae glycoside

193. What chemotherapeutic agent is a drug of choice for treatment of herpes?

- A. Acyclovir
- B. Rifampicin
- C. Doxycycline hydrochloride
- D. Chingamin
- E. Metronidazole

194. What local anesthetic is given to patients with cardiac rhythm disturbance?

- A. Lidocaine
- B. Paracetamol
- C. Morphine hydrochloride
- D. Caffeine and sodium benzoate
- E. Nitrazepam

195. The patient with bronchial asthma had been prescribed salbutamol, which led to disappearance of bronchospasm symptoms. It happened due to stimulation of:

- A. β_2 -adrenoreceptors
- B. α_1 -adrenoreceptors
- C. Muscarinic acetylcholine receptors
- D. Acetylcholine synthesis
- E. β_1 -adrenoreceptors

196. What drug is advisable for individual malaria prophylaxis?

- A. Chingamin
- B. Rifampicin
- C. Ampicillin
- D. Gentamicin
- E. Trimethoprim/sulfamethoxazole (Co-trimoxazole)

197. Choose the most efficient way of convallariae glycoside administration

for acute cardiac failure treatment.

- A. Intravenous
- B. Intramuscular
- C. Subcutaneous
- D. Internal
- E. Inhalational

198. Which one of the drugs listed below is potentially addictive?

- A. Trimeperidine
- B. Acetylsalicylic acid
- C. Naloxone
- D. Diclofenac sodium
- E. Paracetamol

199. The 55-year-old patient had been diagnosed with angina pectoris. Calcium channel-blocking agent was prescribed for treatment. Name this agent.

- A. Amlodipine
- B. Atenolol
- C. Guanethidine
- D. Reserpine
- E. Labetalol

200. The patient has mucosal dryness and mesopic vision disorder. What vitamin deficiency causes these symptoms?

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

INSTRUCTIONAL BOOK

Testing Board

TEST ITEMS FOR LICENSING EXAMINATION: KROK 1. PHARMACY.

Kyiv. Testing Board.
(English language).

Approved to print 27.08./№82. Формат 60x84 1/8
Offset paper. Typeface. Times New Roman Cyr. Offset print.
Conditional print pages 20. Accounting publishing pages 18.
Issue. 252 copies.

List of abbreviations

A/G	Albumin/globulin ratio	HR	Heart rate
A-ANON	Alcoholics anonymous	IDDM	Insulin dependent diabetes mellitus
ACT	Abdominal computed tomography	IFA	Immunofluorescence assay
ADP	Adenosine diphosphate	IHD	Ischemic heart disease
ALT	Alanin aminotransferase	IU	International unit
AMP	Adenosine monophosphate	LDH	Lactate dehydrogenase
AP	Action potential	MSEC	Medical and sanitary expert committee
ARF	Acute renal failure	NAD	Nicotine amide adenine dinucleotide
AST	Aspartat aminotransferase	NADPH	Nicotine amide adenine dinucleotide phosphate restored
ATP	Adenosine triphosphate	NIDDM	Non-Insulin dependent diabetes mellitus
BP	Blood pressure	PAC	Polyunsaturated aromatic carbohydrates
bpm	Beats per minute	PAS	Periodic acid & Schiff reaction
C.I.	Color Index	pCO ₂	CO ₂ partial pressure
CBC	Complete blood count	pO ₂	CO ₂ partial pressure
CHF	Chronic heart failure	pm	Per minute
CT	Computer tomography	Ps	Pulse rate
DIC	Disseminated intravascular coagulation	r	roentgen
DCC	Doctoral controlling committee	RBC	Red blood count
DM-2	Non-Insulin dependent diabetes mellitus	RDHA	Reverse direct hemagglutination assay
DTP	Anti diphtheria-tetanus vaccine	Rh	Rhesus
ECG	Electrocardiogram	(R)CFT	Reiter's complement fixation test
ESR	Erythrocyte sedimentation rate	RIHA	Reverse indirect hemagglutination assay
FC	Function class	RNA	Ribonucleic acid
FAD	Flavin adenine dinucleotide	RR	Respiratory rate
FADH ₂	Flavin adenine dinucleotide restored	S1	Heart sound 1
FEGDS	Fibro-esphago-gastro-duodenoscopy	S2	Heart sound 2
FMNH ₂	Flavin mononucleotide restored	TU	Tuberculin unit
GIT	Gastrointestinal tract	U	Unit
Gy	Gray	USI	Ultrasound investigation
GMP	Guanosine monophosphate	V/f	Vision field
Hb	Hemoglobin	WBC	White blood count
HbA1c	Glycosylated hemoglobin	X-ray	Roentgenogram
Hct	Hematocrit		
HIV	Human immunodeficiency virus		